Readiness to expand the role of the nurses working in primary healthcare centres in Saudi Arabia to include prescribing: An exploratory descriptive qualitative study

This Thesis is submitted to Cardiff University in fulfilment of the requirements for the Degree of Doctor of Philosophy

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2024

Abstract

Introduction: Primary healthcare centres (PHCs) in Saudi Arabia are the first point of contact for patients across the country (Al Saffer et al., 2021). However, these PHCs face various accessibility challenges, including unequal distribution of PHCs and their services (Al-Sheddi et al., 2023), a shortage of medical professionals (Al Saffer et al., 2021), a lack of specialised services (Makeen et al., 2020), and long waiting times (Albarhani et al., 2022). One way to enhance accessibility, reduce waiting times, and alleviate various burdens on the healthcare system in Saudi Arabia is to grant nurses prescribing rights (Hibbert et al., 2017; Almotairy et al., 2023). However, Saudi research into the readiness to incorporate the prescribing role into nursing practice in PHCs is currently lacking. This study aims to investigate readiness to incorporate the prescribing role into nursing practice in Saudi PHCs.

Methods: An exploratory and descriptive qualitative (EDQ) research was used as the chosen methodology. Twenty-five individual semi-structured interviews were thus conducted with participants who were divided into three groups: this gave ten nurses at the micro-level, five nursing supervisors and five managers at the meso-level, and five policymakers at the macro-level. The collected data was then analysed using reflexive thematic analysis (RTA).

Findings: Six key themes emerged from the data analysis. These were improving primary healthcare services, nurse-doctor partnership prescribing, educational preparation, acceptance of the nurse prescribing role, establishing the legality of the nursing prescribing practice, and readiness of primary healthcare centres.

Conclusion: Implementing the nurse prescribing role in PHCs services has the potential to improve PHC services through enhancing accessibility and reducing

waiting times. A nurse-doctor partnership prescribing approach may be implemented, in which nurses and physicians share prescribing responsibilities while doctors remain responsible for diagnosis. However, nurses' general lack of pharmacological knowledge is a major obstacle, requiring additional focus on educational preparation. Another potential barrier could be a lack of acceptance of the nurse prescribing role among patients, doctors, and nurses. Several changes are thus necessary to existing systems, including the introduction of clear legislation and regulations and ensuring the readiness of PHCs to smooth the implementation of the NP role.

Declaration

This thesis is the result of my own independent work, except where otherwise stated, and the views expressed are my own. Other sources are acknowledged by explicit references. The thesis has not been edited by a third party beyond what is permitted by Cardiff University's Use of Third-Party Editors by Research Degree Students Procedure.

Statement 1

This thesis is being submitted in partial fulfilment of the requirements for the degree of *PhD.*

Statement 2

This work has not been submitted in substance for any other degree or award at this or any other university or place of learning, nor is it being submitted concurrently for any other degree or award (outside of any formal collaboration agreement between the University and a partner organisation)

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I hereby give consent for my thesis, if accepted, to be available in the University's Open Access repository (or, where approved, to be available in the University's library and for inter-library loan), and for the title and summary to be made available to outside organisations, subject to the expiry of a University-approved bar on access if applicable.

Acknowledgements

I would like to thank my supervisors from the bottom of my heart for all the help, support, and motivation they have given me during my studies. Their knowledge and ideas have been extremely helpful in developing this thesis, and I am particularly grateful for their patience, valuable feedback, and constant commitment to my academic development. Their support has been an inspiration and has significantly contributed to the completion of this thesis.

It was emotionally difficult for me to manage the departure of Professor Molly Courtenay who supervised my doctoral research for the first 3.6 years. Every time I read or cite your publications, however, I experience a sense of contentment, and I have grown confident that I have been left in competent hands. Thank you, and I wish you all the best. Additionally, Dr Clare Hawker, I appreciate your concise and clear explanation of the comments made during our meetings, which helped overcome various language constraints. Dr. Dominic Roche, my thanks to you for accepting and joining our research team. This emotionally supported me, when I felt alone as a PhD student without a long-term supervisor to turn to.

My sincere gratitude also goes to Professor Ben Hannigan for assisting me in locating my first supervisor. I am also grateful to Claire Hopkins for her assistance in providing transparent responses to correspondence enquiries.

Many thanks must go to my family, my father, mother, brothers, and sisters for their support throughout my studies. My appreciation also goes to the various gatekeepers at the relevant institutions for allowing me to reach potential participants, as well as to the participants themselves, who gave so generously of their time and shared their valuable perspectives.

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Chapter 1: Introduction

1.0 Introduction

This chapter provides a background and comprehensive review of the healthcare system in Saudi Arabia, with a special emphasis on Primary Healthcare Centres (PHCs) and the continuing efforts across the country to improve these facilities. In addition, the chapter discusses current challenges associated with the accessibility of healthcare services related to PHCs, with a focus on identifying barriers to access for primary healthcare services. The chapter explores some global perspectives and approaches for addressing challenges associated with healthcare access, including the advancing and expansion of nursing practice to include the prescribing role. Finally, it provides valuable insights from nurse prescribing practices in other countries, which Saudi Arabia could potentially consider.

1.1Background

The Ministry of Health (MoH) in Saudi Arabia is the principal supplier of primary, secondary, and tertiary healthcare services in the country, being responsible for both strategic planning and health policy development (Alessy et al., 2022). Healthcare services are also provided by military hospitals, university hospitals, the King Faisal Specialist Hospital and Research Centre (KFSHRC), and the private healthcare sector (Alessy et al., 2022). Within the system overall, primary Healthcare Centres (PHCs) are essential as the primary point of contact between service users and the healthcare system (Al Saffer et al., 2021). In 2013, the Ministry of Health (MOH) established 2,259 PHCs across the country, at a ratio of 7.53 centres per 100,000 head of population (Almutairi et al., 2020). However, the overpopulation presents significant barriers to healthcare access, particularly in larger cities where PHCs facilities are

anticipated to serve populations exceeding 100,000 people. As a result, the delayed provision of services has become common (Alqhtany, 2019). Furthermore, Alqhtany (2019) asserts that Saudi Arabia needs an additional 900 PHCs across the country to ensure equitable healthcare access for people living in rural and remote areas.

The subsequent sections will discuss the current services provided in PHCs in Saudi Arabia, the transformations necessary to enhance these services, and the ongoing challenges faced by PHCs in meeting the demands of the population.

1.2 Services Provided by Saudi Primary Healthcare Centres

The provision of both preventive and curative primary care services relies heavily on PHCs. Immunisations against infectious diseases, maternal and prenatal care, dental treatment, education about health, and follow-up appointments for chronic disease conditions are offered by PHCs (Al Asmri et al., 2020; Al Saffer et al., 2021). PHCs are also a fundamental component in promoting care coordination across various specialties, ensuring appropriate patient follow-up (Al Omar et al., 2021). They are also vital in directing cases that require more advanced care to public hospitals (secondary care) and ensuring that very complicated cases are referred to specialist tertiary hospitals in central locations (Almalki et al., 2011). All Saudi citizens have the right to access free primary care services through the national system of PHCs, which should ensure that appropriate healthcare is always available (Aljohani et al., 2023).

1.3 Saudi Primary Healthcare Centre Reform

The health care system in Saudi Arabia is currently experiencing significant transformation due to the implementation of the National Transformation Programme 2020 (NTP 2020) and the Saudi Vision 2030 (Yousef et al., 2022). The intended

objectives of these transformation are improvements in PHCs that recognise these healthcare facilities as vital components of the healthcare system (Yousef et al., 2022).

PHCs reform began in 2016, guided and informed by Vision 2030 and an in-depth review undertaken in conjunction with the World Health Organisation (Al Khashan et al., 2021). The fundamental objective of this reform was to increase access to healthcare services by guaranteeing comprehensive coverage alongside equitable distribution, the expansion of e-health services and the implementation of digital solutions (Al Khashan et al., 2021). This reform intends to improve the overall quality of healthcare based on international standards, to build efficient healthcare systems, and to encourage the implementation of preventative measures (Al Saffer et al., 2021). In addition, this reform intends to mitigate the growing burden of non-communicable diseases (Al Khashan et al., 2021).

The reform of PHCs has been characterised by an integrated, family-centric strategy that supports new, more effective, clinical pathways, chronic disease screening, and the integration of mental health services into primary healthcare (Al Khashan et al., 2021). Significant investment has also been made in terms of technology, increasing capacity, and improving accessibility to the services (Al Khashan et al., 2021). As part of this, the Ministry of Health has established health clusters throughout the Kingdom's regions: each cluster features a network of healthcare providers within an integrated administrative structure that can serve millions of people, enabling medical professionals to reorganise themselves throughout the system to improve patient accessibility (Almezaal et al., 2021).

1.4 Existing Challenges Concerning Access to PHC Services

Recent studies have revealed the inequitable distribution of PHCs in Saudi Arabia. Al-Sheddi et al. (2023) reported an overall decline in PHC numbers, as well as regional variations in distribution. Discrepancies between urban and rural regions were also identified by Al Saffer et al. (2021), who interestingly found that rural areas had a greater number of PHCs than urban areas. However, Aljohani et al. (2023) found that the utilisation of primary healthcare service varied between urban and rural areas. Alfaqeeh et al. (2017) further highlighted that those in rural areas may have difficulties accessing PHC services compared with those in urban areas. This highlighted the inequitable distribution of PHCs and their services between urban and rural areas.

PHCs in Saudi Arabia are also chronically understaffed. Al Saffer et al. (2021) found that although PHCs are widespread in rural areas, there is a shortage of doctors in these areas. Al Khashan et al. (2021) also proved that the role of family doctor is significantly underserved in many PHCs in rural and remote areas. This is mainly because of the existence of alternative organisations that provide higher compensation, along with the lack of any incentives to work in remote regions. However, this problem is not restricted to rural and remote areas. Almezaal et al. (2021) revealed that a shortage of doctors in PHCs is the main reason patients are dissatisfied with their appointment schedules, including those in urban areas. A lack of doctors is also causing PHCs to struggle to meet the rising demand from their many patients, as reported by Alharbi et al. (2019). It is obvious that in both urban and rural areas of Saudi Arabia, individuals find it difficult to receive necessary treatment due to a severe shortage of doctors working in PHCs.

A lack of specialised services is also associated with dissatisfied patients, according to studies by Alzaied et al. (2016), Alharbi et al. (2019), and Makeen et al. (2020). Makeen et al. (2020) found that a lack of specialised doctors in primary healthcare services also increased the number of hospital referrals. This lack of specialised services is therefore a major barrier for primary healthcare clinics seeking to meet the different health needs of their patients, as highlighted by Alzaied et al. (2016) and Alharbi et al. (2019).

The impact of long wait times on patient satisfaction has been widely reported by Ibrahim et al. (2015), Almutairi et al. (2017), and Albarhani et al. (2022). These studies indicated that patient dissatisfaction with primary healthcare services is frequently associated with long wait times. Both Alyasin et al. (2014) and Al Omar et al. (2021) acknowledge that long wait times hinder the effective utilisation of primary healthcare services. As a result, patients may choose to visit emergency rooms even if their symptoms are not severe in order to shorten their waiting time.

The Kingdom of Saudi Arabia has undergone notable progress in transforming its primary healthcare system and implementing proposed reforms. Nevertheless, as is evidenced by Saudi literature, it continues to experience several challenges. These challenges include the unequal distribution of PHCs and their services (Al-Sheddi et al., 2023; Aljohani et al., 2023); a scarcity of doctors in PHCs (Al Khashan et al., 2021; Almezaal et al., 2021); patient dissatisfaction due to a lack of specialised services (Alharbi et al., 2019; Makeen et al., 2020); and long waiting times (Al Omar et al., 2021; Albarhani et al., 2022).

It is evident that Saudi Arabia experiences a significant number of obstacles while attempting to provide healthcare services that are both equitable and accessible to its citizens (Alluhidan et al., 2020; Almotairy et al., 2023). These barriers are the direct

result of a scarcity of doctors, a situation that is evident in many other countries (Alluhidan et al., 2020; Almotairy et al., 2023). Previous studies have emphasised the need to make the healthcare system in Saudi Arabia more accessible to members of the population (Hibbert et al., 2017; Almotairy et al., 2022; Almotairy et al., 2023). One feasible solution for dealing with the scarcity of doctors is to advance nursing practice, which may involve granting additional privileges and responsibilities to nurses, such as the authority to prescribe medications (Hibbert et al., 2017; Almotairy et al., 2023). This solution has the potential to alleviate the current burdens on the Saudi Arabian healthcare system, reduce disparities in healthcare accessibility, minimise patient wait times, improve patient outcomes, and enhance the overall quality of care (Hibbert et al., 2017; Almotairy et al., 2023).

1.5 Advancing Nursing Practice

This section provides an overview of Advanced Nursing Practice (ANP), tracing its historical development and defining characteristics. It discusses the roles and responsibilities of Advanced Practice Nurses (APNs). Additionally, it highlights the framework of Advanced Clinical Practice (ACP) in the UK.

Advanced nursing practice (ANP) may be traced back to the 1960s in both the United States of America (USA) and Canada, when it was first implemented. The United Kingdom (UK) was the first country to begin establishing these roles in the 1970s and Australia and New Zealand followed suit in the 1980s (NMC, 2024).

The term “advanced nursing practice” is an umbrella term that is used to describe a particular role that nurses and midwives who work at a more advanced level are responsible for (ICN, 2002). In 2002, the International Council of Nurses (ICN) published a definition of advanced nursing responsibilities with the intention of

facilitating the process of recognising these responsibilities at an international level. The following definition was approved by the ICN (2002):

> *A Nurse Practitioner/Advanced Practice Nurse is a registered nurse with an expert knowledge base, complex decision-making skills, and clinical competencies for expanded practice, shaped by the context and/or country in which they are credentialed. A master's degree is recommended for entry-level practice" (ICN, 2002, p.202).*

The ANP further refined as "Advanced Nursing Practice is a field of nursing that extends and expands the boundaries of nursing's scope of practice, contributes to nursing knowledge and promotes advancement of the profession" (ICN, 2020, p.6). This definition highlights the principles and goals of ANP as a framework for enhancing nursing practice and knowledge. An Advanced Practice Nurse (APN) is thus defined as "a generalist or specialised nurse who has acquired, through additional graduate education (minimum of a master's degree), the expert knowledge base, complex decision-making skills and clinical competencies for Advanced Nursing Practice, the characteristics of which are shaped by the context in which they are credentialed to practice" (ICN, 2020, p.6). This emphasises the idea that APNs are the practitioners who embody the principles of ANP across a variety clinical setting. However, despite the efforts of the ICN, there is still no internationally acknowledged definition of advanced practice. This is because each country adjusts the notion to its particular situation while generally in accordance with the guidelines established by the ICN (NMC, 2024).

APNs often demonstrate an extensive degree of independence in a range of community-based services, such as primary healthcare, ambulatory services and out-of-hospital settings. The acknowledgement of APNs is expanding, which may lead to

changes in the autonomy and range of responsibilities (ICN, 2020). APNs generally have the authority to diagnose medical problems, prescribe medications, approve diagnostic tests and treatments, allocate patients to other services or professionals and admit or release patients from hospitals (ICN, 2020). Over time, APNs have gained recognition as highly skilled professionals in the field of healthcare. Their responsibilities include overseeing healthcare practices, developing policies, providing clinical leadership, demonstrating leadership abilities and integrating research into their profession (ICN, 2020).

However, Advanced Clinical Practice (ACP) represents a framework specifically tailored to the healthcare system in the United Kingdom (NHS, 2017). The framework described advanced clinical practice as the practice undertaken by competent and licensed health and care professionals, characterised by significant independence and ability to make complex decisions. This advanced clinical practice level is supported by a master's degree or its equivalent, including the four fundamental pillars: clinical practice, leadership and management, education, and research (NHS, 2017). These pillars emphasise the fundamental competencies necessary for effective advanced clinical practice, guaranteeing that practitioners are prepared to fulfil the responsibilities of their positions. The NHS framework acknowledges the existence of numerous pathways for the development of advanced practice capabilities (NHS, 2017). Practitioners at this level must demonstrate both fundamental skills and specialised clinical competence relevant to their specific field of practice (NHS,2017).

However, although some professionals may have the term "advanced" in their position's description in the United Kingdom, they may not be functioning at this advanced level for a variety of reasons. The NHS (2017) thus states that employers

must conduct a review of their staff to prevent misunderstandings among the general public and the interdisciplinary team. Moreover, it is important that professionals have the right support, development and facilitation to operate across the four pillars of advanced practice: clinical practice, leadership and management, education, and research (NHS,2017).

Prescriptive authority is a fundamental component of the scope of APNs (ICN,2009). It is important to note that APNs may be regulated by country-specific certification, credentialing or authorisation procedures. APNs should be sufficiently adaptable and flexible to accommodate a diverse array of healthcare systems, regulatory frameworks, and educational requirements for nurses (ICN, 2020). The ICN (2021) further notes that while nurse prescribing is in line with APNs; however, the authority to prescribe varies among countries owing to their educational requirements and prescribing approaches.

The following sections delve into the diverse approaches used to implement nurse prescribing practices in various international contexts, as the current study focusses on the nurse prescribing role. Understanding international approaches is essential to appreciate the drive of different healthcare systems to implement nurse prescribing practices, regulations, educational factors, and nurse prescribing approaches across various countries. This may provide valuable insights that can help guide and benefit the implementation of the nurse prescribing role in Saudi Arabia.

1.6 Global Nurse Prescribing Practice Legislation Development

1.6.1 United States

The United States (US) has a long history of granting legislative authorisation for nurse prescribing, especially for nurse practitioners (NPs) (ICN, 2021). The US was a

pioneer in the field of advanced practice nursing throughout the 1960s, particularly with the introduction of the first Nurse Practitioner program in 1965 at the University of Colorado (OECD, 2024). The scope of this role includes diagnostic, treatment and management responsibilities that have historically been the responsibility of medical professionals (ICN, 2020). Prescriptive authority that nurse practitioners have is of the highest priority in their role (Thomas et al., 2023).

The driving force behind the establishment of NPs who can prescribe medications in the US was the desire to address physician shortages and improve access to primary care, particularly in rural regions (Nuffield Trust, 2023). Since its establishment in the 1960s, the role of NPs has undergone continuous evolution to accommodate the increasing health demands of the population and enhance access to medical treatment (Nuffield Trust, 2023). During the ensuing decades, nurse practitioners expanded their activities to cover specialty, acute and chronic care settings (OECD, 2024).

At present, a certain level of independent prescribing by APNs, including nurse practitioners, clinical nurse specialists and midwives, is permitted in each of the fifty US states and the District of Columbia; however, there is substantial disparity across states about the required level of medical oversight (ICN, 2021). ANP regulation is carried out at the state level, where each state board is responsible for establishing the regulations that determine the scope of nursing practice (Nuffield Trust, 2023). However, NPs have many options for their practice, ranging from complete independence to restricted practice. In unrestricted practice, NPs might work independently, whereas in restricted practice, they need to have physician supervision for certain tasks such as diagnostics and prescribing (Nuffield Trust, 2023).

1.6.2 Canada

Canada has a long experience of nurses in advanced practice roles in primary healthcare services (OECD, 2024). Initially, only NPs in Canada had the authority to prescribe medications (ICN, 2021). NPs first appeared in Canada in the 1960s in response to shortages of medical professionals in rural and remote areas in primary healthcare settings (OECD, 2024). NPs gained formal recognition in the 1970s when policymakers recommended this role as a means of providing healthcare to isolated populations (CNA, 2019).

Although NPs became largely obsolete in Canada by the 1980s as the number of doctors increased, there was renewed interest in NPs in the 1990s to improve access to primary care in light of new concerns about medical professional shortages (OECD, 2024). Legislation recognising NPs took many years to be adopted across the country, with Alberta passing the first legislation in 1996 and the Yukon Territory being the last in 2009 (OECD, 2024). All provinces and territories in Canada currently have formal legislation and regulations in place for NPs (CNA, 2019).

In the Canadian health system, the scope of practice of NPs has continued to increase over the past decade in response to the growing demand for healthcare in both primary care and hospitals (ICN, 2021). However, Canada grants broad prescriptive authority for NPs, approved at the federal level (ICN, 2021). Variations across provinces and territories remain regarding the use of NPs and their scope of practice. For example, while NPs have full responsibilities to order, interpret diagnostic tests, and prescribe in most provinces, these clinical activities are more restricted in some provinces, such as Ontario, Newfoundland, and Saskatchewan (CIHI, 2020).

Recently, legislation that allows registered nurses to prescribe medications has been approved in two of Canada's provinces, Alberta and Ontario, at the post-basic level (training undertaken after obtaining a basic nursing qualification, such as a diploma or bachelor's degree) (ICN, 2021). Both Alberta and Ontario have enacted post-basic prescribing laws, which were established as provincial legislation and are currently in the process of being put into action (ICN, 2021). Currently, it is legal for registered nurses (RNs) to prescribe medications in Canada (CNO, 2023).

1.6.3 Australia

Beginning in the early 1990s, the government of Australia provided funding for 10 demonstration projects in the state of New South Wales (NSW), which is where the role of NPs in Australia was first established (OECD, 2024). These projects were designed to demonstrate the significance of NPs within the healthcare system of Australia since such practice had already been established in the United States and the United Kingdom (OECD, 2024).

In 1998, the state of New South Wales (NSW) made an important move forward by introducing title protection for NPs. In the year 2000, the first two NPs in Australia were granted authority to practice (OECD, 2024). In an approach similar to that of New South Wales, other states and territories have also implemented title protection and made modifications to the legislation governing medicines prescribing. In the beginning, NPs had relatively restricted and constrained scopes of practice; nevertheless, these have increasingly extended over time (OECD, 2024).

NPs who have been allocated approval by the Nursing and Midwifery Board of Australia (NMBA) are authorised to prescribe medications in accordance with the Health Professional Prescribing Pathway (HPPP) Model 1, which permits them to

prescribe medications autonomously (Ahpra, 2023). However, the scope of practice for NPs is governed by the individual NPs, employers and the relevant law (OECD, 2024).

Previously, under HPPP Model 3, which incorporated a structured prescribing framework, registered nurses who had an endorsement for scheduled medicines could prescribe medications only in rural and remote practice settings (Ahpra, 2023). In February 2023, a total of 1,275 registered nurses had this endorsement, which is equivalent to 0.3% of the total number of registered nurses. However, this endorsement was withdrawn in April 2023 given that the safe utilisation of medicines is now regulated by the states and territories via the implementation of local legislation, regulations and protocols (Ahpra, 2023).

Meanwhile, in March 2017, the Commonwealth Chief Nursing and Midwifery Officer held a nationwide symposium that garnered substantial endorsement for a health professional prescribing pathway. The proposed pathway would allow registered nurses who have received appropriate training and education to prescribe medications within their authorised scope of practice under the supervision or designation of an authorised health practitioner (ANMAC, 2023). In 2018, the Nursing and Midwifery Board of Australia (NMBA) proposed the implementation of a Registered Nurse Prescribing Standard of Practice based on a supervised model. This model distinguishes independent prescribers, such as medical practitioners and NPs, who could prescribe medications independently (ANMAC, 2023). The NMBA released a consultation regulatory impact statement (C-RIS) in order to investigate the many possibilities for the proposed model of designated registered nurse prescribers. This provides support for the proposed Registration Standard, which is the Designated

Registered Nurse Prescriber Endorsement for Scheduled Medicines. The decision regulatory impact statement (D-RIS) is now being reviewed by the NMBA and the official proposal for ministerial approval is currently being prepared (ANMAC, 2023).

1.6.4 New Zealand

The first NPs authorised to prescribe medications in New Zealand were approved in 2001 (ICN, 2020). The driver for the advancement of nurse practice in New Zealand was to enhance the accessibility, effectiveness, and affordability of healthcare (ICN, 2009). In 2015, the Nursing Council of New Zealand (NCNZ) eliminated the requirement that limited NPs role to a specific area of practice and implemented a new and general scope of practice (ICN, 2020). NPs are considered authorised prescribers who have the authority to prescribe any medication included in Part 1 of Schedule 1 of the regulations (NCNZ, 2022). It should be noted that midwives in New Zealand have been prescribing medications within their scope of practice since 1990, which has supported the effectiveness of expanding nurse prescribing (ICN, 2009).

The Medicines Regulations (Designated Prescriber-Registered Nurses) were introduced in New Zealand in 2016, marking a major legal change. The modification granted registered nurses the authority to prescribe medications after completing the necessary training in community settings (NCNZ, 2023). Registered nurse prescribers are restricted in the types of medications that they are able to prescribe, depending on their specialised training and responsibilities (NCNZ, 2022). All registered nurses who are permitted to prescribe medications in community health settings can select medications from a list that has been approved by the NCNZ. A variety of medications are included on this list, including those that are available for general

sale, as well as restricted medicines (pharmacist-only) (NCNZ, 2023). According to the ICN (2021), post-basic nurses' authority to prescribe medications in the diabetes clinical field was originally limited in the New Zealand context, but in 2016, new rules were introduced that broadened their prescribing capabilities to include a wide range of medications.

1.6.5 United Kingdom

In the United Kingdom (UK), the nurse prescribing role was first introduced approximately 30 years ago, with a focus on the post-basic level (training following a diploma or bachelor's degree in nursing) (ICN, 2021). The Department of Health, nursing regulators, professional nursing bodies, and general practitioners were among the key stakeholders who collaborated to greatly boost nurse prescribing over the past decade (RCN, 2014). In 1986, the Cumberlege Report proposed allowing community nurses to prescribe medications from a limited list of options (RCN, 2014). Community nurses were the first group of nurses to be authorised to prescribe independently from a restricted list of products published in the Nurse Prescribers' Formulary for Community Practitioners in the UK (Courtenay, 2018).

The Medicinal Products: Prescription by Nurses and Others Act 1992 is the main law that allows nurses and midwives to prescribe medications. A nurse prescriber is defined as "any registered nurse, midwife, or health visitor" (NMC, 2007). However, while the legal basis for nurse prescribing existed, the implementation of this practice was initially slow. Only district nurses and health visitors were granted access to a restricted national formulary in 1998 (RCN, 2014). District nurses and health visitors were able to prescribe medications from a limited national formulary; although progress was gradual, initial objections from medical professionals subsided as

evidence revealed improvements in access, patient safety, and patient-centred care (RCN, 2014).

In 2002, independent nurse prescribing was expanded to enable nurses to prescribe an extensive range of medicines for various conditions, including those listed in the Nurse Prescribers Extended Formulary, which covered over 120 prescription-only medicines, as well as licensed pharmacy and general sales list medicines for NHS use (DoH, 2006).

The implementation of supplementary prescribing was made possible by an additional development in 2003. In conjunction with a clinical management plan produced by a medical prescriber, the broader British National Formulary (excluding controlled substances) could be prescribed by a supplementary nurse prescriber. This approach has demonstrated significant improvements in the treatment of chronic conditions such as asthma, diabetes, cardiovascular disease, and mental illness (DoH, 2006).

Subsequent amendments to medicines legislation have resulted in updated definitions and roles. Previously, district nurse/health visitor formulary nurses and any nurse undertaking a V100 prescribing programme as part of a Specialist Practitioner qualification were defined under the category of district nurse/health visitor formulary nurses. The category is now defined as community practitioner nurse prescribers (V100). Similarly, the NMC (2010) informs what was previously referred to as "extended formulary nurse prescribers" is now referred to as "nurse independent prescribers" (V200), while the category previously referred to as "extended/supplementary nurse prescribers" is now denoted as "nurse independent/supplementary prescribers" (V300).

A nurse independent/supplementary prescriber able to prescribe both independently and also as a supplementary prescriber in partnership with an independent medical/dental prescriber and the patient/client (V200/300) (NMC, 2010). These legislative changes, which became effective on May 1, 2006, thus established a comprehensive framework for nurse prescribing, which substantially increased the scope and impact of nursing practice in the UK (NMC, 2010).

In the UK, an advanced nurse practitioner (ANP) who has completed a master's degree level in clinical practice and is recognised as competent in their responsibilities can make independent decisions on the evaluation, diagnosis, and treatment of patients and is granted the authority to do so independently (NHS, 2023). However, nurses are required to fulfil the Non-Medical Prescribing (NMP) requirement to ensure that it is appropriate for their profession or role and to comply with regulatory requirements before initiating the prescribing role. Practitioners are required to submit evidence of successful completion of the Advanced Clinical Assessment module at Level 7 or its equivalent, as well as comply with their Trust's NMP policy before enrolling in the Non-Medical Prescribing module (NHS, 2022).

1.6.6 Ireland

In Ireland, the Advanced Nurse Practitioner (ANP) emerged as a result of the Commission of Nursing report, which recommended this development in 1998 (ICN, 2020). The first ANP post in Minor Injury Emergency Care was accredited in 2002 (ICN, 2020). Since then, the ANP presence has continued to develop with the intention of establishing a critical mass of approximately 700 ANPs by 2021, which goes toward the target of 2% of ANPs within the nursing workforce (ICN, 2020). In Ireland, a master's degree in nursing is now recommended or required for

qualification as an ANP (NMBI, 2017). The title Registered Advanced Nurse Practitioner (RANP) is protected through the Nursing and Midwifery Board of Ireland (NMBI) (ICN, 2020). The ANP in Ireland is title protected and must be registered with the Nursing and Midwifery Board of Ireland (NMBI). To qualify for registration, the applicant must be a registered nurse or midwife with NMBI and registered in the prescriber's division (Thomas et al., 2023).

Prescribing authority is not only limited to advanced nurse practitioners in Ireland (ONMSD, 2020). The enactment of primary legislation in 2006 provided prescriptive authority for registered nurses and midwives, subject to conditions specified in subsequent regulations (ONMSD, 2020). Drennan et al. (2009) indicate that a primary driver for this recommendation was the recognition that an inability to prescribe led to fragmented care, which contributes to reducing the quality of patient care.

In 2006, the Minister for Health and Children directed the NMBI to develop clinical governance guidance to complement the medicines legislation authorising a registered nurse or midwife to prescribe medication (NMBI, 2019). In fulfilment of this responsibility, the collaborative practice agreement was developed. This agreement served as the standard set by the NMBI to ensure compliance with the requirements outlined in the medicines legislation and establish clear lines of communication within the practice setting (NMBI, 2019). It also defined the parameters of the registered nurse or midwife prescriber's scope of practice (NMBI, 2016). The collaborative practice agreement was a requisite for the registration of registered nurse prescribers (RNPs) and registered midwife prescribers (RMPs) (NMBI, 2019).

The 2017 regulations revoke the 2007 Misuse of Drugs (Amendment) Regulations and introduce stipulations for prescribing MDA-controlled drugs in Ireland (NMBI,

2019). The legislative provisions can be summarised as follows: (1) the nurse or midwife must be employed by a health service provider in a hospital, nursing home, clinic or other health service setting, including private homes; (2) the medicinal product must be one that would typically be administered in the course of services provided in the health service setting where the nurse or midwife is employed; (3) the prescription must be issued in the usual course of providing that health service. Additionally, registered nurses or midwives are authorised to prescribe Exempt Medicinal Products within their scope of practice, subject to specific conditions (NMBI, 2019).

However, a collaborative practice agreement is not a legislative prerequisite for a nurse or midwife to register and practise as a prescriber in Ireland. The NMBI authorised the removal of the collaborative practice agreement on April 17, 2018, as a prerequisite for the registration and authority to prescribe for nurses and midwives. Currently, the local health service provider is responsible for establishing the clinical governance for prescribing medicinal products (ONMSD, 2020).

1.6.7 Spain

The legislation that regulates the practice of nurse prescribing in Spain underwent a significant reform as a consequence of the implementation of Law 44/2003 on November 21, 2003. This legislation prioritised the provision of comprehensive healthcare services by promoting cooperation, process integration, a multidisciplinary approach and the continuity of treatment (Gomis-Jimeno et al., 2023). The principal objective was to prevent the fragmentation of medical services among a variety of specialists (Gomis-Jimeno et al., 2023). According to the ICN (2021), the need to address health worker shortages and enhance the financial and organisational efficacy

of the healthcare provision also justified the expansion of prescriptive authority for nurses in Spain.

Royal Decree 450/2005 was released on May 6, 2005, with the purpose of concentrating on nursing specialisations and bringing attention to the significance of nurse prescribing in Spain (Gomis-Jimeno et al., 2023). Law 29/2006 was passed on July 26, 2006, which further amended the previous law by providing nurses with the autonomy to recommend, use and prescribe medications and health products that are not subject to physician prescription, based on clinical practice standards (Gomis-Jimeno et al., 2023). However, the Minister of Health and Consumer Affairs opposed the regulation of nurse prescribing in 2006, arguing that physicians faced no challenges in prescribing medications; there was a prevailing belief that authorising others to prescribe would not enhance patient safety (ICN, 2009). However, the ICN (2021) notes that Spanish law formally incorporated nurse prescribing in 2009.

Spain, in contrast to many other nations in Central and Northern Europe, is yet to establish the nurse practitioner role. Consequently, there is no official acknowledgement for nurse practitioners in terms of medicine prescribing, which goes beyond the basic pharmaceutical training that is given in undergraduate nursing programmes (Canet-Vélez et al., 2023). According to Canet-Vélez et al. (2023), nurses in Spain are provided with comprehensive training in pharmacology, which enables them to understand medication products, particularly those that are employed by patients with chronic health conditions. Additionally, they are capable of offering health education and promotion (Canet-Vélez et al., 2023). Since the 1970s, Spain has produced many thousands of trained registered nurses who have completed their education at higher education institutions. The educational requirements for nurse

prescribing roles are met by these nurses in accordance with the standards of other countries where the nurse prescribing role has been established (Lillo-Crespo et al., 2022).

In accordance with a recently approved Royal Decree Law, the Spanish Government has implemented the means to broaden the prescribing responsibilities of registered nurses. Each of Spain's 17 Autonomous Communities is required to establish regulations for carrying out these obligations in practice, as stipulated by this legislation. The objective is to strengthen nurses who hold the necessary education to be designated prescribers in their specific areas of practice (Lillo-Crespo et al., 2022).

1.6.8 Summary

It is obvious that the regulations that govern the nurse prescribing authority differ across countries. Nurse practitioners are only able to prescribe medications in the United States and Australia. In countries such as the United Kingdom, Canada, New Zealand, and Ireland, both registered nurses and nurse practitioners are permitted to prescribe medications. The main objectives behind advancing and expanding nursing practice to include prescribing rights are to improve access to medications, address medical professional shortages, and meet rising demand for services across different countries. In the United Kingdom, this initiative also seeks to manage costs and alleviate doctors' workloads.

The next section delves into the education and training required to prepare nurses to prescribe medications in various countries, as examining standards of educational preparation across the world may provide valuable insights to inform educational preparation in Saudi Arabia in accordance with international perspectives.

1.7 Nurse Prescribing Education Requirements

It is important to note that the educational requirements for nurses to prescribe medications differ significantly between nations. However, all curricula are required to contain both theoretical and practical components that are supervised by an authorised prescriber (ICN, 2021). In the United States, APNs are required to complete advanced postgraduate education (ICN, 2021). Additionally, registration as a registered nurse along with an academic degree, is required. However, the specific number of years of experience needed as a registered nurse or generalist nurse varies depending on the particular school and programme (Wheeler et al., 2022). To qualify as an advanced practice registered nurse (APRN), a minimum of 500 supervised direct patient care clinical hours is mandated (NONPF, 2017). Licenses must be periodically renewed, with some states requiring continuing education in order to renew licenses (Buckley, 2015).

In Canada, the minimum educational preparation for an APN is a master's degree; nurses need to have a minimum of two years as a registered nurse or generalist nurse (Wheeler et al., 2022). The Canadian Nurses Association (2019) states that as part of their ongoing registration requirements, all APNs are required to demonstrate their commitment to continuing competence and quality improvement, consistent with APNs and their scope of practice (Wheeler et al., 2022). In Canada, registered nurse prescribing competencies are not included in the entry-level competencies that are acquired during undergraduate nursing education. However, the College of Nurses of Ontario (CNO) grants the authority to prescribe medications to registered nurses upon successful completion of a continuing education program (CNO, 2023). The CNO's public registry will indicate a nurse's prescribing authority (CNO, 2023).

In Australia, a master's level education (minimum AQF level 9) specific to NPs is the minimal level of education required to prescribe medications (ICN, 2020; ANMAC, 2023). Candidates must have a minimum of two years of experience as a registered nurse in a specified clinical field (CNMO, 2020).

Advanced nurse practitioners, also known as authorised nurse prescribers in New Zealand, must have a minimum of four years of experience working as registered nurses or generalist nurses before they are entitled to pursue a master's degree (Wheeler et al., 2022). According to the ICN (2009), postgraduate prescribing training may be included in the Master of Nursing degree in New Zealand. For a registered nurse to become a designed nurse prescriber, they must have completed a minimum of three years of full-time equivalent practice in the area in which they are interested in prescribing to meet the requirements of postgraduate prescribing training (NCNZ, 2022). Candidates must successfully complete a prescribing programme, including supervision by a medical practitioner or nurse practitioner, before obtaining authorisation from the Nursing Council of New Zealand to prescribe medications (NCNZ, 2023).

Registered nurses who would like to practice as prescribers in the United Kingdom must undertake a prescribing programme that includes a minimum of 26 days of teaching from a higher education institution (HEI), 12 days of practical learning and three to six months of self-directed study. Prior to submitting an application for the V300 supplementary/independent prescribing programme, the applicant must also have a minimum of one year of registration with the NMC (NMC, 2018; NMC, 2023). In the United Kingdom (UK), becoming an advanced nurse practitioner requires a minimum of two to seven years of experience working as a registered nurse

or a generalist nurse (Wheeler et al., 2022). It is necessary for nurses to meet the Non-Medical Prescribing (NMP) requirements in order to guarantee that it aligns with their profession and to comply with regulatory requirements to prescribe medications (NSH, 2022).

Nurses and midwives in Ireland are required to have a minimum of three years of post-registration clinical experience, with no less than one year of full-time exposure to their chosen area of prescribing practice. Furthermore, they must present information technology literacy and hold competencies at Level 8 of the NQAI framework (NMBI, 2015). The educational programme for prescriptive authority (as approved by the Nursing and Midwifery Board of Ireland) spans six months and includes 28 days of theoretical instruction (to include self-directed study and exams) and 12 days of clinical supervision in the relevant clinical area. The Nursing and Midwifery Board of Ireland (NMBI, 2015) emphasises interprofessional education to support the professional identity of nurses and midwives in their prescribing practice. Nurses who want to become advanced nurse practitioners who can prescribe medications must have a minimum of three years of experience working as registered nurses or generalist nurses (Wheeler et al., 2022).

In contrast to the educational approaches described above, Spain recognises the ability of nurses to prescribe medications as an integral component of the curriculum for nursing education at the undergraduate level (ICN, 2021).

1.7.1 Summary

Educational approaches and their enrolment requirements that prepare nurses to prescribe medications vary considerably across nations. In the United States and Australia, the only means by which nurses can gain prescribing authority is the

completion of a master's degree, while in countries such as the United Kingdom, Ireland, and New Zealand, a variety of educational opportunities, including intensive prescribing programme and master's degrees, are available. Notably, Spain incorporates prescribing competencies into the undergraduate nursing curriculum, enabling the cultivation of such abilities during the early stages of nurse education.

The following section discusses several approaches to implementing nurse prescribing practice, which may provide valuable insights for the Saudi healthcare system.

1.8 Approaches for the Implementation of Nurse Prescribing Practice

Various nations have introduced and developed the practice of nurse prescribing in different approaches. Differences in healthcare systems, geographical population distributions, and the status of nursing in each country may explain this diversity (ICN, 2009). However, nurse prescribing approaches may be divided into three main approaches: independent prescribing (autonomous), supplementary prescribing, and prescribing via a structured prescribing arrangement (protocol) (ICN, 2021).

Independent prescribing is the right granted to competent prescribers that allows them to evaluate patients, diagnoses, and make informed decisions about suitable medications or treatments. They thus have the authority to prescribe medications, whether from a limited or unlimited list of authorised medications. Independent prescription is also known as initial, autonomous, substitutive, or open prescribing (ICN, 2021).

Supplementary prescribing arises from voluntary partnerships between independent prescribers and supplementary prescribers. The independent prescriber undertakes the initial assessment and diagnosis of patients (ICN, 2021). Independent prescribers must

collaborate with supplementary prescribers to develop a patient-specific clinical management plan (DoH, 2006). Supplementary prescribing is also known as dependent, collaborative, or semi-autonomous prescribing (ICN, 2021).

Group protocols, also referred to as patient group directives, are explicit written directives that outline the supply and administration of specific medications in a clinical setting (ICN, 2009). Pharmacists, doctors, and other competent experts develop the protocols, and employers need to approve them (ICN, 2009).

The extent of prescriptive authority that NPs have in the United States varies from state to state and may be defined as either independent authority to prescribe (with the exception of controlled medications) or collaborative prescribing with a physician (ICN, 2020). In Australia, nurse practitioners are permitted to prescribe medications independently (ANMAC, 2023). In New Zealand, nurse and midwife practitioners (authorised prescribers) can prescribe independently all medicines appropriate to their areas of prescribing practice (NCNZ, 2023). Meanwhile, registered nurse prescribers (designated prescribers) can prescribe medications from the list of medications within their scope of practice after consulting with and under supervision by an authorised prescriber (NCNZ, 2023). In Canada, nurse practitioners can independently make a diagnosis, order and interpret diagnostic tests, prescribe medications and perform specific procedures within their legislated scope of practice (ICN, 2020). Registered nurses with prescribing authority can prescribe specific medications independently or in collaboration with other healthcare professionals in Canada (CNO, 2023).

In the UK, nurse prescribers are authorised to act in an independent or supplementary prescribing role in partnership with other independent prescribers (DoH, 2006). In Ireland, advanced nurse and midwife practitioners have the right to prescribe

medications within collaborative practice agreements with other healthcare professionals (Thomas et al., 2023). Additionally, registered nurse prescribers are mandated to conclude a collaborative practice agreement that specifies the clinical area and the medications that they are authorised to prescribe (NMBI, 2016). In Spain, nurses may prescribe medications independently that does not need a prescription from a medical professional; they are also permitted to prescribe medication in collaboration with other professionals and may be able to change the dosage in line with the protocols that have been developed (Canet-Vélez et al., 2023).

1.9 Clinical governance for nurse prescribing practices

Clinical governance for nurse prescribing practice has similarities across nations. Clinical governance and evidence-based practice are critical to nurse prescribing and must include adherence to and, when necessary, deviation from national and local guidelines, protocols, policies, and decision support systems (NMC, 2019). Additionally, clearly defined clinical governance policies must establish the lines of authority and responsibility by including the scope of practice, boundaries, and support systems (ICN, 2021). These policies must be thoroughly documented and readily available to access by any staff member to guarantee a safe and consistent approach to prescribing practices (ICN, 2021).

To guarantee the safety and efficacy of prescribing practices, organisations require strong leadership and organisational governance. A systematic approach to monitoring, evaluating, and improving medication management and prescribing are critical components of the nurse prescribing role (ICN, 2021). A clinical supervision and feedback system must be established to support nurse prescribers in their practice (ICN, 2021). Management of the potential risk of nurse prescribing and reporting

adverse medication reactions is also required (NMC, 2019). To further improve the required competencies of nurse prescribers, continuing professional development, clinical reflective practice are essential (NMC, 2019).

1.10 Insights from international nurse prescribing practice

The fundamental drive for the growth of advanced nursing practice in many countries is the persistent challenges to access healthcare services (Nuffield Trust, 2023). In the United States and Canada, one of the most significant factors that contributed to the expansion of nursing practice was the recognition of a significant scarcity of medical professionals, particularly in rural areas (Nuffield Trust, 2023). These countries' goals were to address the deficiencies of primary care services, improve accessibility and guarantee that underserved communities receive appropriate healthcare services (Nuffield Trust, 2023).

For more than twenty years, Australia has been able to manage the rising demands of an ageing population and a rise in the prevalence of chronic illnesses through the advancement of the nursing profession. This strategy has allowed Australia to efficiently manage growing demand among the ageing population, ensure continuity of care and reduce hospital admissions (Ahpra, 2023). In Ireland and New Zealand, healthcare reforms have expanded nurse prescribing to improve accessibility and efficacy (ICN, 2020). These improvements have been driven by the desire to create more effective healthcare services by minimising wait times and improving patient outcomes (ICN, 2020). In the United Kingdom, the emergence of nurse prescribing has aimed to enhance the quality of patient care, reduce waiting times, alleviate the burden on physicians, and decrease expenditure across the healthcare system (DoH, 2006).

The healthcare system in Saudi Arabia is facing a variety of challenges, including an anticipated growth in the region's population, an increase in average life expectancy, an increase in the incidence of chronic illnesses and an insufficient capacity for hospitals and primary healthcare institutions (Thomas et al., 2023). These problems are further exacerbated by the scarcity of medical professionals in the country (Thomas et al., 2023). Saudi Arabia might deal with these problems and identify potential solutions by benefiting from the experiences of other nations that have faced comparable healthcare problems. As detailed above, many such countries have advanced and expanded nursing practice to include prescribing medications in order to address such problems.

Saudi Arabia is confronted with comparable difficulties to other nations within the realm of healthcare services, so it could therefore be advantageous for the country to align its plans with the lessons learnt from these nations. Saudi Arabia's healthcare system is now facing a shortage of physicians (Almutairi et aal., 2020). If the country adopts approach that is comparable to that of the United States and Canada, nurses could be trained to provide comprehensive care, including prescribing. This would help to manage the shortage of doctors and result in increased access to medications and healthcare services. Similar to Australia, Saudi Arabia is not only experiencing an increase in the prevalence of chronic diseases but also dealing with an ageing population (Almutairi et al., 2020). The Saudi Arabia's healthcare system may be better prepared to meet the demands of an ageing population and an increasing prevalence of chronic diseases through permitting nurses to prescribe medications. In the UK, the professional, financial and clinical domains have established the necessity for the allowing nurse to prescribe medications (DoH, 2006). The health system of the

Kingdom of Saudi Arabia (KSA) is currently facing significant challenges due to the high cost of healthcare services (Al Saffer et al., 2021). Saudi Arabia could learn that expanding nursing practice to include prescribing roles could help to alleviate medical professionals' burdens and increase the cost of healthcare provision.

Countries across the globe have devised a variety of educational approaches, reflecting the flexibility of educational approaches that will prepare nurses to prescribe medications. In the United States, nurse practitioners are required to have either a master's or doctorate degree to acquire the ability to prescribe medications (ICN, 2021; Wheeler et al., 2022). In Ireland, New Zealand, and the United Kingdom, nurses have access to a variety of educational approaches. Educational approaches such as intensive prescribing programme that allow registered nurses to prescribe medications, and master's degree programmes that educate nurses to become nurse practitioners (Tan et al., 2023). The existence of this heterogeneity demonstrates that there is no single approach that is universally applicable.

Saudi Arabia might recognise that allowing nurses to prescribe medications, whether via the required master's degree or intensive prescribing programme, may help to meet professional and clinical needs. Saudi Arabia will experience the benefits of flexible educational approaches if it adopts both an intensive prescribing programme and a master's degree. Flexible training approaches could potentially strengthen the Saudi Arabian nursing workforce by preparing them to prescribe medication. This would make it possible for the country to fulfil its continuously shifting healthcare needs with greater effectiveness. Nurses could receive the authority to prescribe independently or in collaboration with medical professionals, depending on the level of education they have completed.

1.11 Summary

The global variation in nurses' authority to prescribe medications is evident since it may either fall within the scope of practice for nurse practitioners or be included within the practice of registered nurses. The educational requirements for nurses to be licensed to prescribe medications are also varied; this may be achieved either by completing a master's degree, taking part in standalone intensive prescribing programme or enhancing the prescribing competence of nursing students during their undergraduate studies. Existing nurse prescribing approaches are dependent on legislation and regulations, which vary across different countries. However, although education, legislation, and the regulatory framework vary among countries, the clinical governance for nurse prescribing is broadly comparable.

Although nurse prescribing practice has been introduced and implemented successfully in many countries, a variety of factors may positively or negatively influence the implementation of the role. It is therefore pivotal to undertake a detailed exploration of the facilitators and barriers to the adoption of nurse prescribing practice within a healthcare system. Exploring these factors is essential not only in countries where nurse prescribing roles have already been implemented but also in those where such roles have yet to be implemented. This would help identify the factors that contribute to the smoothness or difficulty of implementation at various stages, before, during and after the adoption of nurse prescribing roles. The next chapter provides an exploration of the existing research to identify the key factors that may facilitate or hinder the implementation of nurse prescribing.

Chapter 2: Literature review

2.0 Introduction

This chapter presents a literature review that explores the facilitators and barriers to implementing the nurse prescribing role. It describes how the literature review was conducted, including the following steps: formulating the research question, developing inclusion and exclusion criteria for study selection, screening relevant studies, and extracting pertinent data. The chapter also presents thematic findings from the included studies, along with a critical discussion of these findings.

2.1 Aim of the literature review

This literature review aims to explore the facilitators and barriers to the implementation of nurse prescribing practice by reviewing studies undertaken in countries where nurses have taken on prescribing roles, as well as in countries where nurse prescribing has not been implemented.

2.2 Review Method

A narrative review (NR) is a method used to synthesise existing literature to provide a comprehensive understanding of a topic (Ferrari, 2015). Unlike systematic reviews (SRs), which adhere to structured methodologies like PRISMA, NRs offer greater flexibility. This makes them particularly effective for examining broad topics, exploring conceptual ideas, and identifying gaps in research (Ferrari, 2015). The approach also allows for the inclusion of diverse study designs, such as clinical trials, observational studies, and expert opinions (Ferrari, 2015).

This flexibility made the NR approach well-suited for the current review, which aimed to explore facilitators and barriers to implement nurse prescribing by examining evidence from countries where it has been implemented and those where it has not. This

enabled the identification of recurring themes and patterns. It also helped create a cohesive narrative to better understand the factors influencing nurse prescribing implementation in varying healthcare contexts.

Nevertheless, NRs are frequently criticised for their inherent subjectivity in the selection of studies, which may introduce selection bias (Ferrari, 2015). To mitigate this risk, clear inclusion and exclusion criteria were established, and six databases Medline, Embase, PubMed, CINAHL, Scopus, and Web of Science were systematically searched to ensure a broad and comprehensive review, as advocated by Greenhalgh (2019). A common criticism of NRs is the lack of detailed documentation regarding the literature search process, including the databases used, search terms and inclusion or exclusion criteria applied. This omission can compromise the validity and reproducibility of the review process (Greenhalgh, 2019; Ferrari, 2015). To mitigate these concerns, a comprehensive record of search strategies, study selection processes, and reasons for exclusions was maintained, adhering to best practices outlined by Ferrari (2015) and Moher et al. (2009). These details were transparently presented through the use of a PRISMA 2020 flow diagram and a summary table of included studies, enabling readers to critically evaluate the rigour and comprehensiveness of the review. Although NRs do not necessitate the formal critical appraisal of included studies (Boland et al., 2017), this remains a recognised limitation of this review approach.

2.2.1 Search Strategy

The researcher undertook a detailed and organised search of six bibliographic databases to discover and highlight keywords in line with the PICO concept outlined below (please see Section 2.2.2). Five databases (Medline; Embase; PubMed;

CINAHL; Scopus; Web of Science) were searched for relevant studies. The first step was to carry out a preliminary search of EBSCO Medline to test the search terms and identify keywords. Boolean operators and truncation were used. The selected keywords were nurse*, prescrib*, prescriptive authority, barrier*, facilitat* (please see Appendix A). These keywords were utilised to make a systematic search and identify associated articles from the chosen databases detailed above. In addition, the reference lists of the articles that had been included in the full-text review were examined for additional research papers.

2.2.2 Inclusion and Exclusion Criteria

This review incorporated original research articles, and the PICO acronym was used to formulate the question for the literature exploration in the following way: P-Population: nurse prescribers (whether registered nurses as non-medical prescribers, nurse practitioners, or nurse specialists or nurses who are qualified to prescribe independently or supplementary), nurses (non-prescribers), and other stakeholders who have implications for the nurse prescribing role, including policymakers, administrators, educators and other healthcare providers; I-Intervention: studies that explore those factors that affect the nurse prescribing role implementation across all three levels of healthcare settings, primary, secondary and tertiary; C-comparators: do not apply in this review; O-Outcome: facilitators and barriers to nurse prescribing role implementation. This review included primary research (whether quantitative, qualitative or mixed methods) that had been published in peer-reviewed journals and published in English in the period 2000-2024. It did not include any studies that focused on other prescribing groups, such as physicians, pharmacists, physiotherapists, radiographers and dentists. Specialists' opinions, review articles and

abstracts from conferences were also excluded, as were any studies published in languages other than English.

2.2.3 Screening and Selection

All references were imported from bibliographic databases into the EndNote 20 (reference management tool to manage the references). Deduplication was conducted to remove any duplicate references. The remaining references were then exported to Rayyan systematic review (a cloud-based software application) to apply the inclusion and exclusion criteria. Meanwhile, some duplicate references were manually removed.

To facilitate the screening and selection of papers, the researcher created a table to assess the relevance of full-text papers based on the inclusion and exclusion criteria (please see Appendix B). In line with Boland et al.'s (2017) recommendation, this tool was piloted on approximately 30 titles and abstracts.

The researcher conducted three screening stages to identify relevant studies. In the first stage of screening, only titles were screened. The titles of all studies were screened by applying predefined inclusion and exclusion criteria to determine their initial relevance. Studies that failed to fulfil the specified criteria for inclusion based on their titles were thus excluded. In the second stage of screening, abstracts were screened. The researcher screened the abstracts of the studies deemed appropriate after title screening. Studies that did not meet the inclusion criteria following the screening of their abstracts were not included. If the abstract failed to provide sufficient information to assess eligibility, however, the study proceeded to the full-text stage.

This screening process was repeated after one day to ensure consistency and to document the number of papers excluded, along with their reasons for exclusion (Boland et al., 2017). Full-text papers were obtained for those studies that passed the initial screening stage and which were deemed relevant. In the third stage of screening, the researcher read each full-text paper carefully. However, some papers still did not meet the eligibility criteria for inclusion in this review, and these were thus excluded; the reasons for their exclusion are documented in a table (please see Appendix C).

2.2.4 Data Extraction

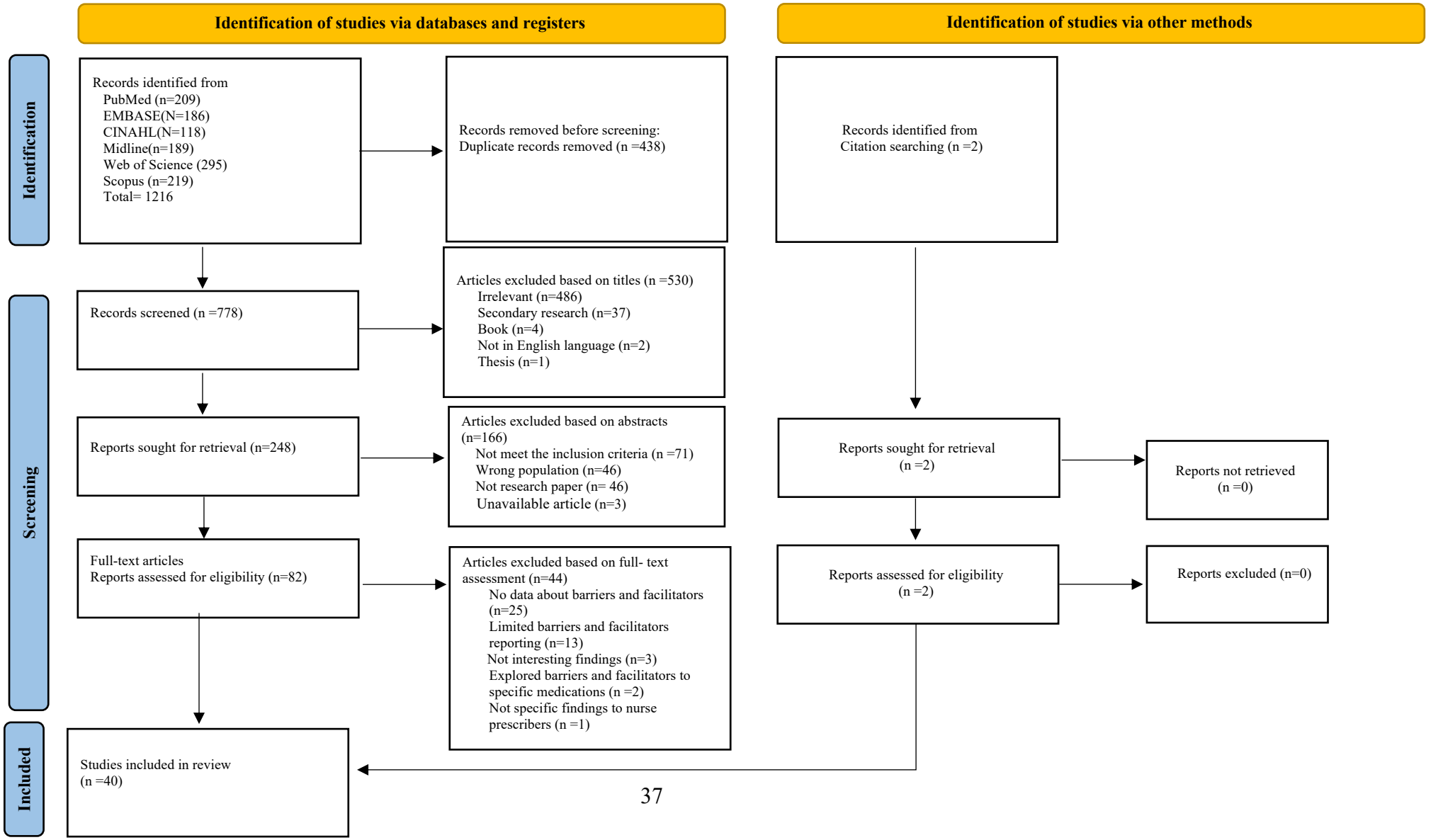
The researcher extracted the relevant data from each included study. This data was organised within a Microsoft Word table, which included the following details for each study: author name(s), publication year, study location, research aims, study design, settings, sample, data collection method and key findings. Supervisors (two independent reviewers) evaluated the data extraction table (please see Table 1).

2.3 Results

2.3.1 Included studies

A total of 1216 articles were initially identified, which was reduced to 778 after the removal of duplicates (n = 438). Figure 1 presents the PRISMA flow diagram outlining the screening and selection process. Based on title screening, 530 papers that did not meet the inclusion criteria were excluded. A total of 248 papers were retrieved for their abstracts and a further 166 papers were excluded. The researcher conducted a full-text review of the remaining 82 papers, leaving 38 studies that met the inclusion criteria. The citations of the included studies were reviewed to identify further papers, which led to the inclusion of two additional papers that met the inclusion criteria. Therefore, a total of 40 studies were included in this review.

Figure 1: PRISMA 2020 flow diagram for updated systematic reviews which included searches of database



2.3.2. Characteristics of the included studies

The key characteristics and findings from the included studies can be found in Table 1. Among the studies included in the review, 16 were qualitative studies, 19 were quantitative studies, and five used a mixed-methods approach. Most of the qualitative studies used interviews without further clarifying their methodological approaches (n = 10), while three employed a case study design, two adopted a phenomenological approach, and one was a descriptive qualitative study. The sample sizes for the qualitative studies ranged from 6 to 31 participants. All quantitative studies were cross-sectional surveys (n = 19), and the sample sizes ranged from 36 to 4,424 participants.

The participants in these studies were nurse prescribers working in primary care (n = 10), secondary care (n = 8), or both settings (n = 10). A smaller number of participants worked in community settings (n = 8). In studies that included non-prescribing nurses (n = 6), they worked in different settings: primary care (n = 1), secondary care (n = 2), or both settings (n = 3). Also, one study included policymakers, and one study included mental healthcare workers. The majority of the included studies were conducted in the UK (n = 20), with the remaining studies taking place in New Zealand (n = 4), Australia (n = 4), Ireland (n = 4), Iran (n = 3), Spain (n = 2), Saudi Arabia (n = 1), Poland (n = 1), and Finland (n = 1).

Table 1 (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Almotairy et al. (2023) Saudi Arabia	To explore nurses' readiness to prescribe medication under supervision. To investigate the relationship between supervised prescribing practices and demographic variables in Saudi Arabia.	Quantitative study (cross-sectional study)	Across all healthcare and non-healthcare contexts, including academic institutions.	379 nurses	Online questionnaire.	The participants demonstrated considerable consensus (strongly agree and agree) regarding several factors that could potentially influence the implementation of nurse prescribing under supervision. These factors included the availability of appropriate mentors or supervisors to assist in facilitating the growth of roles, skills, and knowledge (72.9%, n = 276), and the recognition of the influence of prescribing on nurses' workload (72.5%, n = 275). The majority of nurses (72%, n = 273) reported the need for support from their nursing colleagues. Nurses also reported support from their medical colleagues (70.4%, n = 267) and pharmacy colleagues (69.9%, n = 265). Moreover, a large majority of nurses (71.3%, n = 270) reported having supportive legislation, regulations, and relevant health policies. More than half of the nurses (68.6%, n = 260) agreed that organisational commitment is necessary.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Boreham et al. (2013) UK	To assess various approaches to nurse prescribing training and determine their suitability for preparing participants for prescribing practice.	Mixed methods	The study involved ten different centres providing nurse prescribing training in Scotland.	A total of 192 nurses, midwives, and health visitors began nurse prescribing programmes, with a high participation rate of 97% (n =186) in the questionnaire survey. 47% of the respondents were involved in the focus groups. Educato rs (n = 10).	Multiple data collection methods, including a questionnaire administered to all course members enrolled in prescribing programmes, followed by focus groups and interviews with programme providers.	One of the main positive features of the nurse prescribing programme was its ability to provide students with a systematic understanding of pharmacology, which served as a strong foundation for their practice. Feedback from focus groups emphasised the significance of this knowledge in comprehending the actions and interactions of drugs encountered in their clinical settings. Participants particularly valued the increased awareness of adverse drug reactions and contraindications that the programme facilitated.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Bowskill et al. (2012) UK	To investigate how nurses incorporate prescribing into their clinical practice.	Qualitative study (case studies)	Primary and secondary care settings.	26 nurse prescribers.	Semi-structured interviews.	This study found that there are many medications that are restricted in care settings by employers or organisation formularies, which causes significant differences in how prescription agreements are fulfilled in both primary and secondary care settings. Moreover, this makes it very difficult for new prescribers to find a balance between sticking to prescribing budgets and ordering prescription pads. Additionally, a further barrier to medicine prescription is the lack of peer support. Finally, professional relationships can be used to define prescribing and to enhance nurse prescribers' competence in prescribing medications.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Canet-Vélez et al. (2023) Spain	To describe nurses' experiences with the introduction and implementation of nursing prescriptions.	Qualitative study (interviews)	Nurses who worked in primary care centres, urgent primary care services, and nursing homes.	The study included 28 nurses (24 female and 4 male). 19 approved nurse prescribers took part in the two discussion groups.	Semi-structured individual interviews and discussion groups.	Some nurses struggle with recognising themselves as prescribers due to inadequate training in pharmacology or a lack of confidence in their skills. The list of medicines and devices they can prescribe is restrictive and incomplete, and in emergencies, home care, or chronic patient care, physicians must approve prescriptions. The study participants identified a lack of confidence in their abilities and responsibilities among certain healthcare professionals and a portion of the population. This lack of confidence reflects the presence of misinformation about nurse prescribing. The participants emphasised the importance of normalising nurse prescribing among the general public and empowering nurses to engage in prescribing activities. This would involve nurses taking part in the entire care process, from identifying patients' needs to implementing actions to address the identified problems.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Carey et al. (2007) UK	To examine the prescribing practices of supplementary nurse prescribers who administer medications to patients with skin conditions in both primary and secondary care settings. The study also aimed to identify the factors that either facilitate or hinder this mode of prescribing.	Quantitative study (national questionnaire survey)	Primary and secondary care.	The participants included 580 qualified supplementary nurse prescribers located throughout the UK.	National questionnaire survey.	The findings of the study revealed that all participating supplementary nurse prescribers (100%) reported feeling confident in their prescribing abilities for patients with skin conditions. However, several implementation problems were identified. The most commonly cited challenge, highlighted by 22.1% of respondents, was difficulties in implementing the Clinical Management Plans (CMPs), such as the lack of computer-generated prescriptions and the application of CMPs to electronic patient records. Lack of understanding of supplementary prescribing by doctors and pharmacists was reported by 13.5% of participants, while 8.6% felt there was a lack of peer support. A small percentage (2.1%) mentioned their own clinical knowledge gaps as a hindrance to prescribing practices.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Carey et al. (2010 a) UK	To explore the perceptions of relevant stakeholders regarding the impacts that nurse prescribing has on dermatology services.	Qualitative study (case study)	Primary and secondary care.	Nurse prescribers (n = 11), doctors (n =12), admin staff (n =11), non-nurse prescribers (n = 6).	Multiple methods of data collection (interviews, questionnaires).	In this study, insufficient access to continuing professional development (CPD) and a lack of support for nurse prescribers were identified as key barriers, alongside the skills of the workforce and organisational restrictions.
Carey et al. (2010b) UK	To explore the CPD needs of nurses who prescribe medicines for patients with diabetes.	Quantitative study (questionnaire survey)	Primary and secondary care.	The participant pool consisted of 439 qualified Nurse Independent Prescribers (NIPs) and Nurse Supplementary Prescribers (NSPs) located throughout the UK.	Questionnaire.	The respondents indicated their CPD needs within or after the following 12 months. The highest demand for CPD was in the category of "update on prescribing policy," with 42.5% (n = 184) requiring it within the next 12 months and 30.7% (n = 133) requiring it after 12 months. On the other hand, the least required areas of CPD were "assessment and diagnosis of diabetes" and "diabetes knowledge," with 59.1% (n = 256) and 43.9% (n = 190), respectively, reporting no CPD needs in these areas.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Casey et al. (2020) Ireland	To outline the prescribing behaviours and practices of nurse prescribers. To investigate the factors enabling and hindering prescribing practice.	Quantitative study (cross-sectional national survey)	Hospital/community.	84 nurse and midwife prescribers (77 were registered nurses and 6 were registered midwives, with 1 dual registered).	Questionnaires.	The key barriers affecting nurse prescribers were identified, and these included extensive workloads, insufficient support, a lack of CPD, and rules/policies that were too restrictive. However, a number of enabling factors were also highlighted, such as confidence in knowledge and decision-making skills, experience, education, supportive colleagues, access to information and continuous professional development, and adequate clinical supervision.
Cashin et al. (2014) Australia	To assess nurse prescribers' confidence in managing medications.	Quantitative study (online survey)	Emergency care, chronic disease non-emergency care.	209 nurse practitioners.	Questionnaires.	The findings of this study revealed that nurses tend to have confidence in some areas of prescribing practice, such as educating clients and monitoring reactions to medicines administered. However, they are less confident when it comes to areas such as adjusting dosages or discontinuing medicines prescribed by other healthcare practitioners.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Coull et al. (2013) UK	Describe and evaluate the implementation of nurse prescribing in Scotland from 2001. Describe and evaluate various approaches to nurse prescribing training with regard to educational experiences for practice.	Mixed methods	Nurse prescribers working in primary, secondary or community care.	The response rate was 26% nurse prescribers (n = 948)/general public (n =1,016 in 2004, n =1,007 in 2007). Six case studies with nurse prescribers.	Questionnaire and semi-structured interviews.	This study found that CPD, support and time issues (such as time allocated time for studying, training and education), and budgetary resources were the key factors facilitating the roles of nurse prescribers. Moreover, it was revealed that the implementation of nurse prescribers positively impacts relationships between professionals, particularly those between prescribers and pharmacists. However, several barriers were also reported, including a general lack of diagnostic expertise and delays in prescription pads, which also appeared to impact nurses' prescribing skills, knowledge and confidence, primarily due to the gap between qualification and practice.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Courtenay et al. (2006) UK	To assess the level of preparedness among independent extended supplementary nurse prescribers in prescribing medications for patients with dermatological conditions.	Quantitative study (questionnaires)	Primary and secondary care settings.	A total of 868 completed questionnaires, with 638 of these nurses actively prescribing medicines for skin conditions.	Questionnaires.	In general, the prescribing programme met the needs of the participants when it came to prescribing medications for patients with dermatological conditions. Those who had undertaken a diploma-level module in dermatology and/or attended dermatology study days, as well as those working in both primary and secondary care, reported a significantly higher level of preparedness during the programme compared to nurses without this specific preparation in dermatology.
Courtenay et al. (2007) UK	To outline prescribing practices and investigate the factors that facilitate or hinder prescribing practice.	Quantitative study (national questionnaire Survey)	Primary and secondary care settings.	868 qualified independent extended/ supplementary nurses.	Questionnaires.	The most prevalent obstacles included the inability to generate prescriptions using computers, inadequate formularies, a lack of established arrangements or guidelines by employers upon entering the profession, insufficient guidance for budgeting and distributing prescription pads, and the implementation of CMPs. Additionally, nurses in primary care settings reported greater CPD needs than their counterparts in other settings.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Courtenay et al. (2008 a) UK	To examine Nurse Independent and Nurse Supplementary Prescribing, specifically in the context of diabetes care, and assess the level of preparedness felt by nurses in these roles.	Quantitative study (national questionnaire survey).	Primary care/general practice.	The study included 439 nurses from across England.	Questionnaires.	A small portion of nurses (7.6%) reported that the prescribing programme did not adequately meet their needs. Notably, nurses who had undergone specialised training in diabetes reported a significantly higher level of preparedness compared to those without such training. Overall, nurse prescribing for people with diabetes was viewed positively by the nurses involved in the study.
Courtenay et al. (2008b) UK	To provide an overview of nurse independent and supplemental prescribing in the UK.	Quantitative study (national questionnaire survey).	General practice/ primary care.	A total of 1,400 (70%) questionnaires were returned, with 1,377 completed.	Questionnaires.	Out of the participants, 699 nurses (53.0%) expressed confidence in adopting the nurse prescribing role. However, several challenges included local restrictions, difficulties with electronic prescriptions, objections from medical staff or pharmacists, and challenges in accessing doctors. Approximately 15% of the nurses reported problems related to clinical expertise, peer support, and objections.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Cousins et al. (2012) UK	To explore an overview of the prescribing practices and the factors that facilitate or inhibit prescribing practice.	Qualitative study (interviews).	Clinics.	Six independent nurse prescribers.	Individual semi-structured interviews.	All participants in this study demonstrated positive attitudes towards prescribing medications. Moreover, they highlighted its many advantages and stated that they would no longer be willing to go back to a non-prescribing clinical role. Participants reported feeling satisfaction from being able to carry out their jobs autonomously and holistically. On the other hand, participants also reported higher stress levels resulting from work overload, a lack of support with their professional development, and insufficient pay for the increased clinical responsibility, which they perceived to be somewhat unfair.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Currie et al. (2018) New Zealand	To briefly outline prescribing practices and investigate the factors facilitating or hindering prescribing practice.	Quantitative study (electronic cross-sectional survey).	Primary care and Specialty Teams scope of practice.	Registered nurse prescribers (n = 36).	Questionnaires.	Most participants reported having been given support/supervision/mentorship when becoming a registered nurse with the authority to prescribe medications in general practice. However, they highlighted a number of potential disadvantages with regard to the implementation of registered nurse prescribing in general practice in New Zealand. The most frequently reported issue was found to be confusion regarding the role/scope of nursing practice. This was found to be the greatest barrier and thus requires significant attention. These research findings raise important issues that must be considered in future, including the importance of training, supervision, and ongoing professional development. It is also crucial to develop strategic and organisational multi-level action plans and guidelines, as well as to assess processes collaboratively with relevant stakeholders.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Darvishpour et al. (2016) Iran	To assess policymakers' opinions regarding the factors facilitating and impeding nurse prescribing in Iran.	Qualitative study (interviews).	N/A	14 participants were recruited, including 6 members of the Nursing Board, 6 members of the Iranian Nursing Organization, and 2 senior employees of Iran's Ministry of Health and Medical Education.	Semi-structured interviews, face-to-face in-depth interviews	Several factors are involved in facilitating the roles of nurse prescribers, including positive views of health policymakers, the nurse's individual ability to undertake the role, governmental and non-governmental organisational activities, suitable pharmacological education, and priority of law. However, the key barriers affecting nurse prescribing were highlighted as insufficient knowledge and experience amongst nurses, poor understanding and use of skills and cost-effectiveness in healthcare systems, legal concerns, and a general lack of self-confidence amongst nurses.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Fox et al. (2022) Australia	To investigate the readiness of nurses to expand their practice to include prescribing medications under a model of supervision.	Quantitative study (cross-sectional study).	A wide variety of practice settings including medical, surgical, community, primary health, and emergency settings.	4,424 nurses	Online survey.	The majority of participants (2,812, 64.7%) agreed that supporting legislation, regulations, and appropriate health policy facilitated registered nurse prescribing. The presence of appropriate mentors and supervisors who could support the development of roles, skills, and knowledge was reported by 2,696 participants (61.7%). A significant proportion of 50.7% (n = 2,213) participants identified remuneration as a primary enabling factor for prescribing practice.
Fox et al. (2023) Australia	To investigate nurses' preferences for educational preparation.	Quantitative study (cross-sectional study)	Not mentioned	4,424 nurses	Survey.	The study found that 67.1% (n = 2,970) of participants preferred a nurse prescribing course to align with a postgraduate certificate or higher qualification, while 25.4% (n =1,125) preferred a certificate from a workplace or tertiary institution. The course, recognised at an Australian Qualification Framework Level, was the most frequently reported contributing factor among 79.6% (n = 3,523) of the respondents.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Hopia et al. (2017) Finland	To define facilitators and barriers that influence nurse prescribing competence from the perspective of the nurses who study in a prescribing programme.	Qualitative study (descriptive qualitative study)	Primary care	31 registered nurses, including public health nurses (n = 8) and midwives (n = 2).	The study used the text of student online learning diaries as data during a 14-month prescribing programme.	This study revealed that nurses' confidence in prescribing medications can be enhanced through peer networking, support from the work community and supervisors, positive attitudes of doctors towards nurse prescribing, and using skills learned during training. However, factors such as unclear job descriptions, inadequate care plans, and concerns regarding the organisation and implementation of consultation significantly impacted nurses' roles as prescribers.
Jodaki et al. (2024) Iran	To explain the challenges to nurse prescribing role.	Qualitative study (interviews)	Secondary care	13 nurses.	Semi-structured interviews.	The study found that legal difficulties act as a hindrance to nurse prescribing. Also, education curricula for nurses do not place an emphasis on diagnosis and prescribing at all levels of education and therefore fail to adequately prepare nurses to prescribe medication. The study found that patients' lack of acceptance, mistrust between medical and nursing teams, and a lack of support from doctors also act as barriers.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Jones et al. (2010) UK	To assess the effectiveness of pharmacology training programmes for improving the knowledge of mental health nurse prescribers. To investigate individual participants' positive and negative experiences of prescribing training.	Mixed methods	Acute inpatient Community Addictions	13 mental health nurse prescribers.	Questionnaire and interviews.	Several barriers were identified during this study, including colleagues' negative attitudes, lack of enthusiasm amongst employees, and poor financial rewards. Some participants reported being concerned about additional responsibilities involved in managing patient health safety, which they believed made their professional life more difficult.
Kelly et al. (2010) UK	To outline the key factors hindering the nurse prescriber's role.	Quantitative study (survey).	Primary care.	251 practice nurses were invited to participate and 151 were returned completed.	Posted questionnaires.	This research identified the key reasons for not taking a prescribing course. These included age, lack of support, poor financial incentives, lack of confidence, intense nature of prescribing course, lack of interest by general practitioners (GPs), and poor managerial support (especially when it comes to covering the course fees and allowing study time).

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Latter et al. (2007) UK	To assess the efficacy and adequacy of training programmes used to prepare nurses for independent prescribing roles and to discuss nurses' perceptions of the CPD offered to them as prescribers in practice.	Quantitative study (National survey)	General practice/primary care. Other clinical areas included Accident and Emergency and palliative care.	Random sample of 246 independent nurse prescribers	Postal questionnaire survey	This study found that the majority of nurse practitioners received at least 12 days of supervision from a designated supervising medical practitioner during their educational preparation, and the participants seemed satisfied with this. Many also reported that they had received support and supervision from doctors once they had qualified as prescribers. These findings indicate that most nurse prescribers felt comfortable diagnosing patients and informing them of their treatment options. They also felt sufficiently confident to accept personal responsibility for prescribing decisions. However, a few participants did report feeling slightly anxious about making an incorrect diagnosis. For the most part, the participants indicated that they felt confident and capable of carrying out a range of prescribing duties through CPD.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Lennon et al. (2018) Ireland	To investigate the experience of nurse prescribers in acute service settings.	Qualitative study (descriptive phenomenological design)	Secondary care.	11 registered nurse prescribers	Semi-structured, face-to-face individual interviews	This study revealed a number of issues impacting nurse prescribing practices, including increased workloads and the length of time needed to adhere to practice standards. Moreover, colleagues' unfamiliarity with nurse prescribing practice was also highlighted as a significant issue, in addition to governance structures, lack of resources, support and access to CPD, and poor financial rewards.
Lim et al. (2017) New Zealand	To gain a wide understanding of learning and practising prescribing.	Qualitative study (interviews)	Primary and secondary care.	10 nurse practitioners	Semi-structured individual interviews	In this study, most participants felt that they had collaborative but dependent relationships with doctors before being certified as nurse practitioners. However, their new role ultimately destabilised these relationships and blurred the boundaries of the roles. It was also found that healthcare practitioners who worked closely with nurses tended to be more accepting of their ability to prescribe medications, whilst those who were not familiar with their clinical strengths were more likely to display criticism.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Lockwood et al. (2008) Ireland	To assess the opinions of clinical nurse specialists (CNSs) in Ireland regarding nurse prescribing. To understand the factors preventing them from expanding into this role in future.	Quantitative study (questionnaire)	Primary and tertiary care settings.	A total of 173 completed questionnaires were returned from the respondents, representing a response rate of 64%.	Self-administered questionnaires	Most participants felt that future role expansion was a major barrier to nurse prescribing, as well as a fear of legal consequences, poor knowledge of nurse prescribing, and insufficient education and training. Less than 50% of participants felt that poor financial support was a major barrier to nurse prescribing.
Maddox et al. (2016) UK	To investigate the factors influencing the decision of nurse and pharmacist Non-Medical Prescribers (NMPs) in community and primary care settings to assume responsibility for prescribing.	Qualitative study (interviews)	The study comprised participants working in diverse settings, with nurse NMPs practising in the community, GP practices, nursing homes, and various other settings.	20 NMPs, consisting of 15 nurses and 5 pharmacists. Three focus groups with 10 nurses	Semi-structured interviews and focus groups	The findings revealed that nurses often fear professional consequences and criticism in the event of prescribing errors. Concerns about receiving the same level of support as doctors also contributed to their reluctance to take on prescribing responsibilities. However, some participants felt adequately supported by their regulatory bodies. The study also highlighted the participants' discussions on the boundaries of their roles as NMPs, with some being unwilling to assume responsibility for decisions outside their competencies.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Muyambi et al. (2019) Australia	To gain insights into the perspectives of mental health workers (MHW) in metropolitan and regional areas regarding MHN prescribing.	Qualitative study (interviews)	Mental health service.	17 mental healthcare workers Rural (n = 11) Metropolitan (n = 6)	Focus groups	The importance of providing MHNs with the necessary educational preparation to prescribe was emphasised by the participants. All those who participated in the focus groups emphasised the significance of strong governance, supervision, and support strategies needed for MHNs to prescribe. Strong emphasis was placed on the limited prescribing authority of the governance framework in the metropolitan setting. The regional focus group, in contrast, supported flexible governance alongside outstanding oversight.
Naderi et al. (2021) Iran	To explore ICU nurses' attitudes towards the necessity of nursing prescribing and the barriers to its implementation.	Quantitative study (cross-sectional survey)	ICU	136 nurses	Questionnaire	The majority of nurses (86%, n = 98) agreed it was feasible to fulfil this role in the ICU. The most significant possible barriers to adoption were a lack of legitimacy, lack of acceptance from doctors, and the reluctance of nursing managers.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Pearson et al. (2020) New Zealand	To understand registered nurse prescribers' experiences To understand opinions regarding the factors enabling and hindering nurse prescribing.	Qualitative study (interviews)	Varied settings	16 registered nurse prescribers	Semi-structured interviews were conducted either over the telephone or in person	The participants involved in this study felt that the ability to prescribe medications largely expanded their practice. They also reported that this new role increased their levels of responsibility. They also reported feeling frustrated with the restrictions on what they were permitted to prescribe from the formulary. Some participants felt that they deserved more recognition for their new role.
Ross et al. (2012) UK	To uncover the opinions of mental health nurse prescribers regarding the factors hindering independent prescribing.	Mixed methods	Community hospital	33 completed the questionnaire and 12 were nurse prescribers who participated in a focus group.	Questionnaire and focus group.	This study revealed an ongoing issue with the implementation of nurse prescribing. This was primarily due to nurses receiving insufficient support and a general lack of recognition for the added responsibility that comes with the role of prescribing. Additionally, this research found that current prescribing courses were generic and failed to meet the prescribing needs of mental health nurses.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Scrafton et al. (2012) UK	To explore secondary care nurses' experiences of nurse prescribing. To investigate the advantages and disadvantages of nurse prescribing.	Qualitative study (cross-sectional qualitative study).	Secondary care	6 nurse prescribers	In-depth interviews.	All participants in this study reported problems with the educational courses provided to them. The nature of the course and the heavy focus on primary care were the most significant of these concerns. Moreover, pharmacological education level was reported by most participants as being extremely low, lacking depth and generally not relevant to secondary care nurses. For this reason, the participants considered the courses to be unsatisfactory. Negative opinions were also given regarding the poor formal national infrastructure used as guidance for CPD activity, which seemed to generate significant frustration. However, one benefit of educational courses highlighted by the participants of this study was the inclusion of clinical mentorship.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Seck et al. (2023) Spain	To reach a consensus regarding the facilitators and obstacles to nurse prescribing in Spain.	Mixed methods study (Online Delphi survey and focus group).	Health centres in Lleida, including 6 primary care centres, 2 provincial hospitals, 2 nursing homes and a long-stay centre.	Online Delphi survey/19 nurses from a range of practice settings. Focus group/ 5 participants.	A three-round online Delphi survey and focus group.	The obstacles that generated the lowest agreement were as follows: "nursing being subordinate to the physician" (64%); "collaboration problems in health teams due to competency tensions" (58%); "resistance to change from other health care groups"; "not enough information being shared"; and "hurried promotion of NP through non-specific online courses" (57%).The facilitators that elicited the smallest degree of agreement from the participants were as follows: "professional associations should promote and motivate training and collective progress" (64%); and "NP was already a routine occurrence in the nursing profession" (58%). Participants highlighted the need for an adequate educational foundation in NP at the university level, with an emphasis on applied pharmacology as the primary facilitator.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Smith et al. (2014) UK	To assess the usefulness of the initial NIP training and identify regular continuing education, and governance systems for non-medical prescribing.	Quantitative study (national questionnaire survey).	Nurse participants represented a range of settings where nurses prescribed medications for various medical conditions, including primary and secondary care.	The participants included 976 nurse prescribers and 87 leaders.	A cross-sectional national survey.	NIPs generally found their initial prescribing courses to be relevant and effective, with 87% indicating that the courses fulfilled their learning needs and met the specified outcomes. Support from experienced prescribers or access to a network of NMPs was reported by 77% of the participants, though 28% did not have a specific appraisal process addressing their prescribing role.
Stenner et al. (2008) UK	To examine the opinions of nurse prescribers regarding the importance of interprofessional relationships.	Qualitative study (interviews).	Varied settings	26 CNSs in pain.	Semi-structured interviews.	The nurses involved in this study felt that prescribing enabled collaborative working and knowledge sharing between different medical professionals However, a number of barriers were also highlighted, including poor understanding of the role amongst other healthcare professionals and insufficient support. The participants felt that formal support structures (regular clinical supervision) were essential in facilitating ongoing learning for nurses.

Table 1 Continued (Included studies)

Author **Study location**	**Aim**	**Design**	**Setting**	**Sample**	**Method of collecting data**	**Findings**
Stenner et al. (2010) UK.	To investigate the opinions of nurses and team members regarding the implementation of nurse prescribing in diabetes services.	Qualitative study (case study).	Nine sites were purposefully selected to represent a range of acute and community settings, including general practice, where nurses prescribe medications for patients with diabetes.	31 including nurse prescribers, administrative staff, physicians, and non-nurse prescribers.	Semi-structured interviews. The study employed a mixed-methods approach, incorporating various data sources such as video-recorded patient consultations, patient questionnaires, and prescriptions to address different research inquiries.	Nurses recalled encountering challenges during the initial stages of implementation, including issues with inadequate computer systems for prescribing and difficulties accessing prescribing pads. However, these problems have since been resolved. Nurses utilised a variety of resources to meet their CPD and training needs. These resources included workplace support from clinicians, participation in journal clubs, engagement with local prescribing groups, involvement in the Diabetes Prescriber Network, and participation in local forums. Local-level training opportunities were available, with several nurses expressing satisfaction with the quality of training provided.

Table 1 Continued (Included studies)

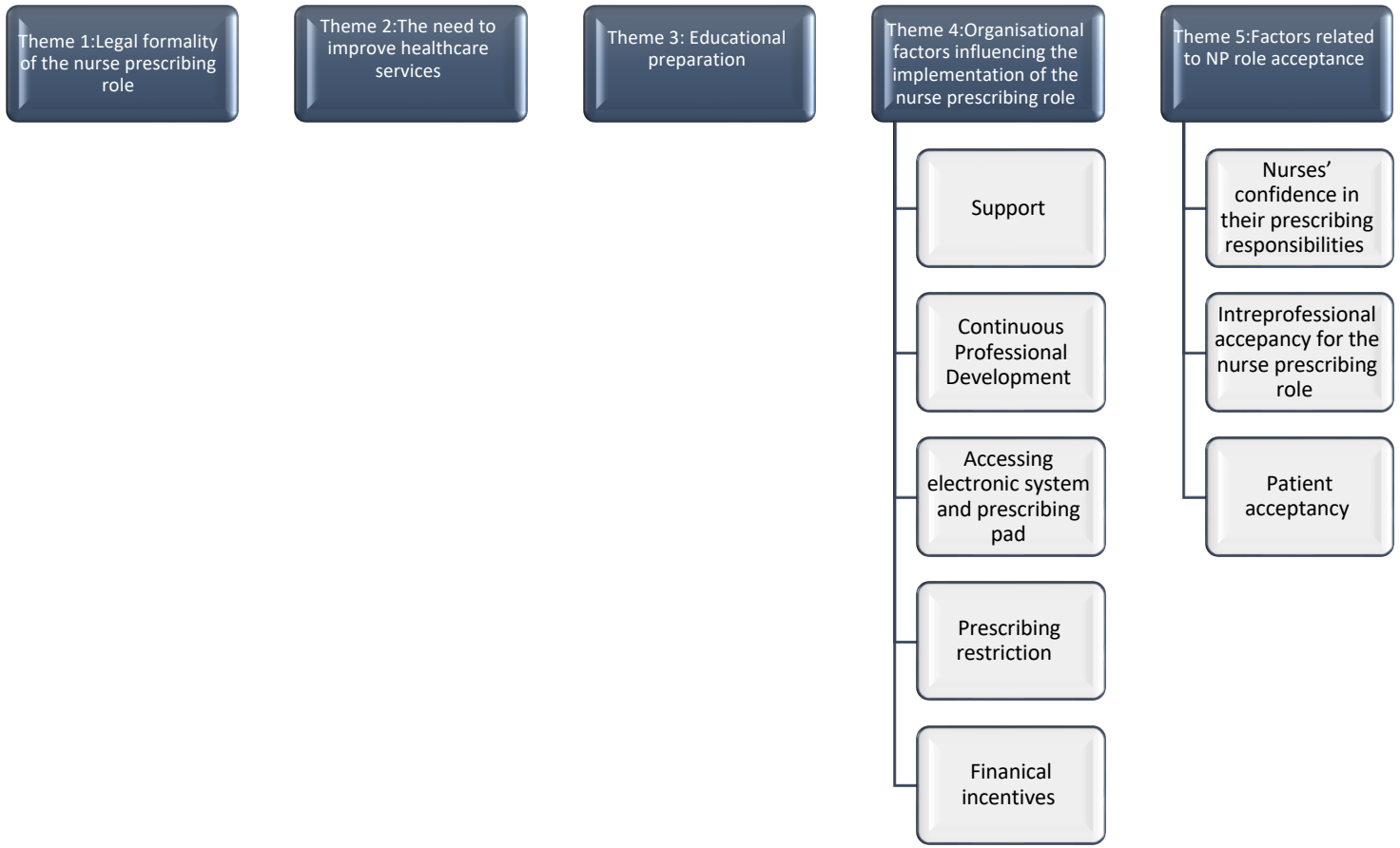
Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Watson et al. (2021) Ireland	To explore the perceptions of nurse and midwife prescribers regarding their educational preparation and identify their CPD requirements.	Qualitative study (hermeneutic phenomenological approach)	Maternity setting.	16 registered nurse prescribers.	Semi-structured interviews.	Participants revealed mixed opinions regarding the pharmacology module provided to them. Some participants felt that the six-month timeframe was insufficient, while others believed it covered a broad range of topics. Additionally, the module was deemed by some to be overly focussed on adult prescribing or the general adult population. Mentorship experiences varied, with some considering it a valuable learning experience, while others viewed it as a mere formality. Importantly, one mentor did not engage in prescribing practice during the mentorship period, leading to reduced learning opportunities. In terms of CPD, the majority of NIPs reported receiving support from their practice, directorate, or department.

Table 1 Continued (Included studies)

Author Study location	Aim	Design	Setting	Sample	Method of collecting data	Findings
Wilkinson et al. (2015) New Zealand	To understand the opinions and intentions of nurses working in primary health care (PHC) settings regarding the two proposed levels of nurse prescribing.	Quantitative study (cross-sectional survey)	Primary health care.	305 nurses	Questionnaires.	In this study, nurses displayed positive attitudes regarding the proposals, which they believed had significant potential to meet unmet health needs. However, efforts would need to be made to ensure that nurses who already provided medications to patients were suitably trained to carry out these tasks. Moreover, to implement the new plans for RN prescribing effectively, a clear policy platform is required to share knowledge.
Zimmermann et al. (2020) Poland	To explore nurses' attitudinal influences during the early stages of nurse prescribing in Poland.	Quantitative study (national cross-sectional survey)	Primary and secondary settings.	N = 819 (nurses and midwifes who were preparing to practise as nurse independent and supplementary prescribers).	Questionnaires and retrospective research based on a secondary analysis of the data.	Despite nurses undertaking nurse prescribing courses (a prerequisite to prescribe), nurses did not feel confident or comfortable prescribing medications during this preparation time. 47% of nurses felt insufficiently prepared to prescribe medications, whilst 77.3% believed that the role involved greater legal responsibility.

2.4 Findings

Figure 2: There were five themes and eight sub-themes that emerged from the literature which are summarised.



2.4.1 Legal formality of the nurse prescribing role

This theme focused on the factors that might either facilitate or impede the legalisation of the nurse prescribing role and its implementation.

Eight studies explored perspectives regarding the legislation and regulation of the nurse prescribing role. Four of the eight studies were quantitative studies (Lockwood et al., 2008; Naderi et al., 2021; Fox et al., 2022; Almotairy et al., 2023), while the remaining three were qualitative studies (Darvishpour et al., 2016; Canet-Vélez et al., 2023; Jodaki et al., 2024). Additionally, one study was a mixed-methods study (Seck et al., 2023). Most of these studies were conducted in Iran (n = 3), and others were in Ireland (n = 1), Spain (n = 2), Australia (n = 1), and Saudi Arabia (n = 1).

Two studies investigated the factors that facilitate the legalisation of nurse prescribing practice under supervision (Fox et al., 2022; Almotairy et al., 2023). Four studies examined related barriers to legalising nurse prescribing practice (Lockwood et al., 2008; Darvishpour et al., 2016; Naderi et al., 2021; Jodaki et al., 2024). Two studies focused on barriers associated with the legal framework in the early stages of implementing nurse prescribing authority (Seck et al., 2023; Canet-Vélez et al., 2023).

A cross-sectional study conducted in Saudi Arabia by Almotairy et al. (2023) focused on investigating registered nurses' readiness to prescribe medications under supervision. Their study recruited a total of 379 nurses from a variety of healthcare and non-healthcare contexts, including educational institutions. Although the results of this study revealed that a total of 30 participants (7.3%) were already prescribing independently, the need for supportive legislation, regulations and relevant policies

for the nurse prescribing role in Saudi Arabia was agreed or strongly agreed upon by 161 (42.5%) and 109 (28.8%) nurses, respectively. This study emphasised the necessity of legislation and regulation to enable nurses to prescribe medications under medical professionals' supervision in Saudi Arabia. However, the utilisation of convenience sampling and small sample size may restrict the generalisability of the results. Therefore, caution should be used when interpreting these results.

Likewise, a cross-sectional study was conducted by Fox et al. (2022) in Australia. Fox (2022) investigated registered nurses' readiness to prescribe medications under supervision. A total of 4,424 registered nurses participated across different healthcare settings. A total of 1,172 nurses (27.0%) agreed, and a further 2,812 nurses (64.7%) strongly agreed that having supportive legislation and regulations and developing appropriate health policies to regulate prescribing practice are important factors to facilitate the implementation of nurse prescribing under supervision.

Both Almotairy et al. (2023) and Fox et al. (2022) conducted studies in countries where legislation and regulations to allow nurses to prescribe medication to their patients are lacking, emphasising the current barrier associated with the legality of nurse prescribing practice in those countries. In contrast to Almotairy et al. (2023), Fox et al. (2022) had a considerably larger sample size. However, Fox et al. (2022) also used a convenience sample approach, which may have limited the generalisability of their results, requiring caution to be used in their interpretation.

A cross-sectional study carried out by Naderi et al. (2021) investigated the barriers to implementing the nurse-prescribing role in Iran. A total of 136 nurses working in the intensive care unit (ICU) participated. This study's results indicated that the lack of supportive legal frameworks proved challenging for nurses wishing to prescribe

medications. A total of 132 participants (96.5%) agreed that nurse prescribing is illegal, and 128 participants (93.8%) agreed that the fear of facing legal penalties was a barrier to prescribing medications. These results support the evidence from the early quantitative study carried out by Lockwood et al. (2008), which aimed to investigate perceived barriers to implementing nurse prescribing among clinical nurse specialists (CNSs) in Ireland. A total of 173 clinical nurse specialists (CNSs) in primary and tertiary care settings were surveyed. This study also found that a total of 153 participants (89%) agreed that the fear of legal penalties, along with the lack of established nurse prescribing practice in Ireland, were significant obstacles to implementing the prescribing role in their practice. In both studies, effective sampling strategies were used. Naderi et al. (2021) used a stratified random sampling approach, while in the study carried out by Lockwood et al. (2008), random sampling was utilised. Random sampling and stratified random sampling in quantitative studies yield results that are generalisable to the population (Rahman et al., 2022). Therefore, these sampling strategies significantly improved the representativeness and reliability of the results in both studies. However, both studies focused on specific clinical settings, requiring their results to be interpreted with caution in the wider context.

A qualitative study was undertaken by Jodaki et al. (2024) explored the barriers to implementing nurse prescribing in Iran. A total of 13 semi-structured interviews were conducted with registered nurses who work in secondary care settings. This study found that the lack of a legal framework is a significant barrier, as the right to prescribe medications was not clearly defined. Nurses stated that they did not prescribe medicines, even though they had the knowledge and experience necessary to prescribe in certain situations. The fear of potential penalties hinders nurses from prescribing medications in many situations. These findings support the evidence from

the early qualitative study carried out by Darvishpour et al. (2016) to explore the factors that facilitate or hinder the introduction of the nurse prescribing role in Iran. A total of 14 semi-structured interviews were conducted with policymakers. This study also revealed that the primary concern among the participants was the need for legislation to facilitate the adoption of the nurse prescribing practices. This was driven by the lack of a well-defined legislative framework that provides nurses the right to prescribe medications. Both Darvishpour et al. (2016) and Jodaki et al. (2024) emphasised the importance of establishing explicit legalisation to facilitate the initiation of the nurse prescribing role in Iran. Although both studies highlighted a lack of legality as a hindrance, however, neither study proposed any specific means or approaches for overcoming the obstacles associated with a lack of legitimacy.

A qualitative study undertaken by Canet-Vélez et al. (2023) explored nurse prescribers' experiences in the early phases of their prescribing roles in Spain. A total of 28 semi-structured interviews were conducted with nurses who were working in primary healthcare services and had a maximum of 12 months of prescribing experience. Two discussion groups were also conducted with accredited nurse prescribers (n = 19) and nursing experts (n = 5) who had been key figures in the regulation and rollout of nurse prescribing practice. Participants viewed that the process of creating a legislative framework that regulates the nurse prescribing practice was challenging. The participants in discussion groups identified the lengthy legislative process for building a legal framework that officially recognises the nurse prescribing practice as the most significant obstacle. They emphasised that only with diligent effort and devotion could the legislative process be an effective undertaking. Their findings do imply that a lack of persistent effort during the legislative process can result in an expanded legislative process. This makes it imperative to encourage

collaboration across various stakeholders to improve the definition of the ways in which this role operates, thus guaranteeing legal recognition within a reasonable timeframe. In qualitative studies, triangulation can be employed to ensure the validity of the data and findings (Fusch et al., 2018). This study's key strengths lie in the involvement of various participant groups, such as regulatory experts and nurse prescribers. Additionally, it utilised various data collection methods, including semi-structured interviews and group discussions to triangulate the data, which enhanced the validity of the study findings.

In Spain, Seck et al. (2023) conducted a mixed-methods study seeking consensus regarding the barriers and facilitators to nurse prescribing practice. A total of 19 nurses from a variety of clinical settings participated in a three-round online Delphi survey, and five nurses participated in a focus group. Participants in the first round of the Delphi survey confirmed awareness that nurses now have legal authority to prescribe medications in Spain, and that establishing this legal framework was critical in terms of granting nurses the authority and ability to fulfil their new responsibilities. The participants nevertheless emphasised the legal limits to their authority, depending on the care settings in which they worked, which complicate the ability of nurses to effectively prescribe medication in a variety of clinical contexts. The focus group data also revealed that although distinct legislative frameworks explicitly authorised nurses to prescribe medication, they perceived the legislation and policies implemented by health authorities as a substantial impediment, hindering their ability to fulfil their prescribing responsibilities. Participants highlighted that these legislative constraints arise from a lack of understanding of nurses' competencies and responsibilities. The participant emphasised that nursing organisations and colleges must actively participate in policy formulation of nurse prescribing practice in order to ensure that

regulations accurately align with the realities of nursing practice. Furthermore, the findings emphasise the need to include nurses in the formulation of health policies, as this could lead to more well-informed and applicable regulations that promote nursing professional growth in the prescribing role. This study's primary strength was the triangulation of data collection methods, including the Delphi survey and the focus groups. Thus, it presented robust evidence to enhance the validity of this study's conclusions (Fusch et al., 2018).

2.4.1.1 Summary

To facilitate the smooth implementation of nurse prescribing practice, it is necessary to have clear legislation and regulations. Recent studies conducted in Australia, Saudi Arabia, and Iran have highlighted the current challenges stemming from the absence of a legislative and regulatory framework, with legislation playing a crucial role in the implementation of nurse prescribing within nursing practice. However, no studies have explicitly provided strategies to facilitate the establishment of legislative authorisation for the nurse prescribing roles in countries where it remains unestablished. The challenges of legalising the nurse prescribing role continue to persist even in the early stages of its adoption in nursing practice. The lengthy regulatory processes and restrictive legislation associated with the nurse prescribing role highlight the difficulties involved.

2.4.2 The need to improve healthcare services

This theme focused on the factors that can facilitate the implementation of nurse prescribing roles in response to the need to improve services within the healthcare system. It highlighted the benefits that the nurse prescribing roles may provide in accordance with the specific demands of the healthcare system.

Seven studies explored the positive impacts of the nurse prescribing role in terms of improving healthcare services, which served as a facilitating factor. Five studies were quantitative (Lockwood et al., 2008; Wilkinson et al., 2015; Naderi et al., 2021; Fox et al., 2022; Almotairy et al., 2023), while two studies were qualitative (Darvishpour et al., 2016; Muyambi et al., 2019). The studies were carried out in Australia (n = 2), Iran (n = 2), Ireland (n = 1), New Zealand (n = 1), and Saudi Arabia (n = 1).

Almotairy et al. (2023) conducted a cross-sectional survey to investigate the factors that facilitate the implementation of nurse prescribing under supervision in Saudi Arabia. A total of 119 participants (31.4%) agreed that nurse prescribing would enhance healthcare provision, and a further 120 participants (31.7%) strongly agreed with this claim. A total of 180 participants (47.5%) reported agreeing, while a further 108 participants (28.5%) reported strongly agreeing that nurse prescribing would improve access to nurse-led care models. In terms of improving patient healthcare experiences, a total of 161 participants (42.5%) agreed that nurse prescribing role would help, while 107 participants (28.2%) strongly agreed. Additionally, a total of 144 participants (38%) agreed, and 83 participants (21.9%) strongly agreed that nurse prescribing has the potential to improve patient access to medications.

The quantitative study carried out by Fox et al. (2022) also investigated those factors that might facilitate the implementation of nurse prescribing under supervision. Fox et al. (2022) used a cross-sectional survey to query a total of 4,424 registered nurses from various healthcare settings. The results again highlighted the potential impact of nurse prescribing under supervision, thus facilitating the implementation of the nurse prescribing role. A total of 1,691 participants (38.4%) agreed, and 2,058 (46.8%) strongly agreed that nurse prescribing role would improve healthcare provision.

Additionally, 1,641 participants (37.4%) agreed, and 2,330 participants (52.7%) strongly agreed, that nurse prescribing role would increase access to nurse-led models of care. Regarding patient healthcare experiences, 1,588 (36.3%) agreed, and 2,183 participants (49.9%) strongly agreed that nurse prescribing would enhance patient experience with healthcare services. Finally, 1,608 participants (36.7%) agreed, and 1,914 participants (43.6%) strongly agreed that nurse prescribing would improve patient access to medications.

Both Fox et al. (2022) and Almotairy et al. (2023) found that the majority of participants agreed on the potential positive impacts of the nurse prescribing role under supervision. This demonstrates robust evidence of registered nurses' common recognition of the potential benefits of integrating nurse prescribing roles into healthcare systems, suggesting that the nurse prescribing role can serve as an approach to tackle the growing demands of the healthcare system.

Naderi et al. (2021) conducted a quantitative study to explore Iranian attitudes toward the necessity of nurse prescribing roles. The study surveyed 136 nurses working in critical care units, whose average ICU work experience ranged from 6 to 10 years. A total of 104 participants (91.2%) agreed that the nurse prescribing role has potential to enhance patients' accessibility to healthcare services and improve healthcare provision. This result is in line with an earlier quantitative study carried out by Lockwood et al. (2008), which aimed to explore attitudes toward implementing the nurse prescribing role in Ireland. The survey examined a total of 173 clinical nurse specialists (CNSs) in primary and tertiary care settings. A total of 145 participants (84%) also agreed that nurse prescribing can enhance the overall effectiveness and quality of healthcare service.

In the two studies undertaken by Lockwood et al. (2008) and Naderi et al. (2021), participants showed a high degree of agreement regarding the advantages of nurse prescribing, indicating a consistent positive attitude toward the role in a variety of settings across two different countries. However, Lockwood et al. (2008) included nurses from different clinical settings and specialties, leading to sample heterogeneity that might complicate interpretation without further investigation of the relevant subgroups. Naderi et al.'s (2021) study only included nurses who work in the ICU, limiting the study's generalisability to other clinical settings. Caution should thus be taken when interpreting and comparing the results from these two studies.

The qualitative studies also reported the positive perceptions toward the nurse prescribing role. Darvishpour et al. (2016) carried out a qualitative study to identify the obstacles and enablers of the nurse prescribing role. A total of 14 semi-structured interviews were conducted with Iranian policymakers. The findings showed that all policymakers who took part in the study believed that nurse prescribing is necessary to fulfil both clinical and patient needs. This seems to present a strongly positive view toward the implementation of the nurse prescribing role. The findings indicate that nurse prescribing is viewed positively; however, the specific benefits or outcomes that are anticipated may not be explicitly highlighted. This means that the interpretation of these findings must be approached with caution.

A more recent qualitative study conducted by Muyambi et al. (2019) explored the perceptions of mental health workers (MHWs) regarding nurse prescribing practice in Australia. A total of 17 MHWs participated in focus groups, with 11 working in rural areas and 9 in urban regions. The focus group participants who worked in remote areas highlighted the difficulties patients in rural areas face in obtaining mental health

medications. The urban focus group also acknowledged the challenges associated with accessing psychiatrists and medication, although to a significantly lower extent compared to remote areas. This highlights the potential benefits to such patients by authorising nurses to prescribe medication. The early quantitative study in New Zealand by Wilkinson et al. (2015) reported similar findings. Wilkinson et al. (2015) aimed to describe the views and intentions of nurses working in primary health care (PHC) settings about registered nurse prescribing. The study surveyed a total of 305 registered nurses working in PHC settings in urban, rural, and semirural areas. In qualitative data, the participants highlighted the need to improve access to medications, considering a variety of problems that could be addressed by nurse prescribing. This included a shortage of doctors, particularly for those living in rural regions who were more likely to experience this problem. The participants emphasised that nurse prescribing practice might also enhance the availability of specialist treatments, especially for patients with chronic conditions such as diabetes and respiratory diseases, in rural and remote areas.

The diversity of participant groups in the studies by Muyambi et al. (2019) and Wilkinson et al. (2015) can be seen as a strength that enhances the credibility of their findings through consensus among various groups across different countries. However, the contextual factors shaping the perspectives of mental health workers and primary healthcare nurses may differ significantly, making direct comparisons challenging. Therefore, the interpretation of the data should be approached with caution.

2.4.2.1 Summary

Studies conducted in countries where the nurse prescribing role has not yet established suggested that the nurse prescribing role could enhance services by addressing the needs of the healthcare system and potentially serving as a facilitator. The primary facilitative factors for introducing nurse prescribing were improving healthcare service provision, increasing patient access to medications, and improving the patient experience (Fox et al., 2022; Almotairy et al., 2023). A restricted number of studies have emphasised the importance of nurse prescribing in specific clinical domains, such as the ICU, mental healthcare, and primary healthcare services (Wilkinson et al., 2015; Muyambi et al., 2019; Naderi et al., 2021). It is thus evident that the need to enhance healthcare services drives the implementation of the nurse prescribing role within the healthcare system.

2.4.3 Educational preparation

This theme focuses on the factors that affect nurses' intentions to engage in appropriate educational preparation for the prescribing role. Furthermore, this theme includes factors that might influence nurse prescribers' experiences in relation to their educational preparation for the prescribing role.

Twelve studies investigated the perspectives on the educational training needed for nurse prescribing practice. These twelve studies comprised six quantitative studies (Courtenay et al., 2006; Latter et al., 2007; Courtenay et al., 2008a; Kelly et al., 2010; Smith et al., 2014; Fox et al., 2023), four qualitative studies (Scrafton et al., 2012; Hopia et al., 2017; Lennon et al., 2018; Watson et al., 2021), and two mixed methods studies (Boreham et al., 2013; Seck et al., 2023). The majority of the studies were conducted in the United Kingdom (n = 7), with the remaining studies being conducted

in a variety of countries, including Ireland (n = 2), Finland (n = 1), Australia (n = 1), and Spain (n = 1).

Three studies investigated the inclination of registered nurses to take part in educational preparation for the nurse prescribing role (Kelly et al., 2010; Fox et al., 2023; Seck et al., 2023). Two studies assessed the extent to which independent extended supplementary nurse prescribers were educationally prepared to prescribe medications for patients suffering from diabetic and dermatological conditions (Courtenay et al., 2006; Courtenay et al., 2008a). Two studies investigated nurse prescribers' perspectives on the appropriateness and efficacy of nurse prescribing education in preparing nurses for their role (Latter et al., 2007; Smith et al., 2014). Three studies investigated nurse prescribers' perspectives about the relevance of pharmacological knowledge acquired during educational preparation to the specific areas of prescribing (Scrafton et al., 2012; Boreham et al., 2013; Lennon et al., 2018). Two studies explored nurse prescribers' perspectives about mentoring throughout their training (Hopia et al., 2017; Watson et al., 2021).

In Australia, a cross-sectional study carried out by Fox et al. (2023) aimed to investigate nurses' preferences for the educational preparation required to maximise uptake of expanding nursing practice to include prescribing according to a supervised model. A total of 4,424 participants from a wide variety of clinical settings, including medical, surgical, community, primary health, and emergency settings, were surveyed. The study's results revealed that a high proportion of the participants agreed that certain factors would influence their intentions to enroll in prescribing programs: 3,523 participants (79.6%) agreed that this was the case where an educational programme had accreditation at a national level and would contribute

towards them obtaining a formal degree, while 2,958 participants (66.9%) agreed that education providers must have institutional recognition, and 2,894 participants (65.4%) agreed that courses should have flexible methods of delivery. In addition, 2,773 participants (62.7%) agreed that the course needed to be free or available at a discounted rate. Another factor affecting engagement with prescribing programmes was receiving paid time off work to finish the course, which 2,350 of participants (53.1%) agreed upon. The least mentioned factor was a recommendation for participation from their workplaces, which was noted by only 1,700 participants (38.4%).

In Fox et al.'s (2023) study, the Chi-square analysis also showed strong correlations between various participant characteristics, such as age group ($p < 0.001$), nursing qualification level ($p < 0.001$), and years of nursing experience ($p < 0.001$). Course recognition at an Australian Qualification Level and accessibility through flexible delivery methods were the main subjects of these associations. Age group was also significantly associated with factors such as the availability of paid leave to complete the course ($p < 0.001$), and the course being free or available at an affordable price ($p < 0.001$). Nevertheless, the logistic regression analysis revealed that the clinical and personal characteristics of the participants had no significant predictive effect on their choice to enrol in a prescribing course, despite the other notable results.

In general, Fox et al.'s (2023) study indicates that the nurses' tendencies to take part in nurse prescribing education may be influenced by a variety of factors not solely dictated by their individual preferences. However, the utilisation of intentional sampling (non-probability sampling) may limit the generalisability of results to a larger population (Asiamah et al., 2022).

An early quantitative study carried out by Kelly et al. (2010) examined the barriers that may exist among registered nurses to pursuing the nurse independent prescribing qualification in the United Kingdom. A total of 151 nurses working in primary healthcare settings completed a questionnaire. Like Fox et al.'s (2023) study, Kelly et al. (2010) also investigated the correlation between the age of the participants and their intention to take part in prescribing training. Among the 151 participants, 5 participants (3%) were under the age of 29, of whom 4 participants (80%) indicated their desire to engage in training. Of the participants aged between 30 and 39, 24 (16% of the total) responded, with 8 participants (33%) indicating their intention to pursue training. The most common age group was between 40 and 49 years old, which featured 72 participants (48% of the total), of whom 31 participants (43%) reported an intention to undergo training. Of the participants aged between 50 and 59, who numbered 43 (28% of the total), only 7 participants (16%) had an intention to undergo training; in contrast, 27 participants (63%) specifically chose not to engage in training. Among the participants, only 7 participants (5%) were aged 60 years or older. Interestingly, none of these participants showed any inclination for taking part in prescribing training. Overall, this suggests that age has a substantial impact on intention to train to be nurse prescribers, with younger nurses demonstrating a greater interest in obtaining the nurse prescribing qualification. The good response rate of 60% highlights the strength of this study. A response rate of 44% is considered satisfactory for quantitative studies with a small sample size (Wu et al., 2022). The favourable response in Kelly et al.'s (2010) study indicates that the data collected is likely representative of the target population, although the sample size was small.

In a recent mixed-methods study carried out by Seck et al. (2023) in Spain to reach a consensus regarding the facilitators and obstacles to nurse prescribing practice. A

three-round online Delphi survey involving 19 nurses and a focus group including 5 nurses was undertaken to gather the study data. The participants in the first round of the online Delphi survey emphasised the necessity of training, including proposing that health centres could offer nurse prescribing training themselves to facilitate the implementation of nurse prescribing (78% consensus). The focus group data, however, revealed that the main facilitator highlighted by participants was the requirement for a strong educational foundation in nurse prescribing at the university level. This foundation had to be comprised of high-quality, inclusive, and forward-thinking education, with a particular focus on applied pharmacology. The participants shared the view that a lack of education might lead to substantial mistakes and adverse effects for the patient. Furthermore, it would promote a feeling of uncertainty and reduce the professional's credibility in prescribing. This suggests that the study participants believe that a combined training model is important for nurses preparing to take on prescribing responsibilities.

The participants thus advocated for the establishment of a rigorous educational foundation in nurse prescribing at the undergraduate level, in conjunction with practical training at centre level. This integrated approach was seen as essential for equipping nurses with the necessary skills, knowledge and experience to carry out their prescribing responsibilities safely and effectively. Both the online Delphi survey and the focus group data demonstrated agreement regarding the need to provide training to nurses to prescribe medications, further strengthening the study's conclusion.

A quantitative study undertaken by Smith et al. (2014) aimed to assess the adequacy of educational preparation among independent nurse prescribers. The survey involved

independent nurse prescribers (n = 976) and leaders (n = 87). A total of 730 independent nurse prescribers (74%) reported that satisfaction with their educational course either completely or mostly met their learning objectives and outcomes. Similarly, Latter et al. (2007) conducted an early quantitative study that evaluated the adequacy of nurses' educational preparation for independent prescribing. The study included independent nurse prescribers (n = 246) who completed questionnaires. The study results indicated that a total of 151 independent nurse prescribers (61%) agreed that their educational programmes were generally satisfactory in meeting their learning needs. This result aligns with Smith et al. (2014); the majority of the participants claimed that the taught programme satisfied their requirements, either to a certain extent, which was agreed upon by a total of 151 participants (61%), or completely, which was agreed upon by a total of 54 participants (22%). However, the level of satisfaction with the prescribing training's ability to equip participants with all necessary prescribing skills varied between Smith et al. (2014) study and Latter et al. (2007). While a total of 650 participants (66%) in Smith et al.'s (2014) study reported satisfaction with their prescribing educational programme, only 54 participants (22%) in Latter et al.'s (2007) study conveyed complete satisfaction with their programme's ability to equip them with all necessary prescribing skills. Although Smith et al. (2014) used stratified sampling, the stratification criteria were unclear, potentially introducing bias in sampling. In addition, Latter et al.'s (2007) study only focused on independent nurse prescribers in England for a specific duration (2002–early 2003), so the results may not be directly applicable to other regions or periods.

A quantitative study undertaken by Courtenay et al. (2008a) aimed to evaluate the readiness of independent and supplementary nurse prescribers to prescribe

medications for diabetic patients. A questionnaire was used, and a total of 439 qualified nurse independent prescribers and nurse supplementary prescribers who prescribed medications for patients with diabetic diseases participated. A total of 409 participants (93.1%) reported that they had engaged in independent prescribing, whereas 214 participants (49.8%) reported participating in supplementary prescribing. The study thus showed a significant difference in satisfaction, dependent upon the level of specialised training. A total of 82 participants without specialist training responded, of whom a total of 65 participants (79.3%) reported that their needs were not met, while only 17 participants (20.7%) felt their needs were completely met. In contrast, among the 327 participants who undertook specialist training, a total of 178 participants (54.4%) indicated that their needs were fully met. Only 149 trained participants (45.6%) reported unmet needs, a considerably lower percentage than that in the group without specialist training. These results highlight the importance of specialist training in enhancing nurses' readiness to prescribe medications for diabetic patients. A random sample approach was employed to recruit nurse prescribers who prescribe medications for diabetic patients. This sampling strategy has the potential to enhance the generalisability of the results (Asiamah et al., 2022).

An early quantitative study by Courtenay et al. (2006) assessed the readiness of independent extended supplementary nurse prescribers to prescribe medications for dermatological patients. A total of 868 nurse prescribers completed questionnaires, and the total number of participants who reported prescribing as an extended nurse prescriber (independent prescribing) since qualifying to prescribe was 605 (94.8%), while 234 (36.7%) reported prescribing as a supplementary prescriber. The study revealed that a total of 122 of the participants (14%) revealed dissatisfaction with the prescribing program resulting from it being unable to meet their needs. However, a

total of 192 participants (22%) reported that the programme met all of their needs. Nurses who completed a diploma-level dermatology module also demonstrated an odds ratio of 0.396 (95% confidence interval: 0.191 to 0.817), indicating that nurses who had this qualification were significantly more inclined to believe that their demands were satisfied than those who did not. The p-value of 0.012 supported the statistical significance of this association, suggesting that nurses who effectively complete the programme have a significant advantage in fulfilling the demands of their prescribing practice in this clinical area, particularly for those with specialised training in dermatology. Although this study achieved a response rate of 73%, it employed a non-random sampling strategy. This indicates that the generalisability of the study's results may be limited (Asiamah et al., 2022).

Both studies by Courtenay et al. (2006; 2008a) emphasised that enrolling in specialised training in their areas of prescribing before completing a prescribing programme can be advantageous in addressing the clinical need for prescribing. This suggests that nurses who obtain specialised knowledge in a particular area may find it smoother to integrate prescribing knowledge with their pre-existing expertise and knowledge.

Qualitative studies also delved into the relevance of prescribing programms to prepare nurses for prescribing role. Lennon et al. (2018) conducted a qualitative study in Ireland to explore the experiences of nurse prescribers in secondary care. A total of 11 semi-structured interviews were conducted with nurse prescribers who worked in acute service. The participants highlighted the need for education programmes for nurses in a prescribing role to provide more relevant pharmacological knowledge that would effectively prepare them to prescribe in their areas of prescribing practice. The

participants emphasised the necessity of modifying prescribing education to address the specific demands of specialised practices.

The findings of Lennon et al.'s (2018) study support the earlier qualitative study findings of Scrafton et al. (2012). Scrafton et al. (2012) also explored the experiences of nurse prescribers in secondary care settings in the UK. A total of six in-depth interviews were carried out with nurse prescribers. The study found evidence that nurses were frustrated with the educational curriculum in pharmacological knowledge due to its overemphasis on primary healthcare settings. All the participants agreed that their educational experiences did not adequately equip them with the necessary pharmacological knowledge to meet the prescribing demand in secondary care.

The findings of the studies carried out by Lennon et al. (2018) and Scrafton et al. (2012) suggest that a review and revision of the educational curriculum for nurse prescribers is necessary to more closely align their pharmacological content and training with the realities and demands of prescribing in secondary care settings. It seems that there is a discrepancy between these educational programmes and the actual pharmacological knowledge and skills that nurse prescribers in secondary care settings require. These studies thus emphasise a major training gap that could potentially impede the effectiveness of nurse prescribers in secondary care.

However, the small sample sizes in Lennon et al. (2018), which included only 11 participants, and Scrafton et al. (2012), which only comprised six participants, may present limitations. Vasileiou et al. (2018) noted that qualitative studies with fewer than 12 participants often struggle to validate their findings. In addition, Boddy (2016) highlighted that small sample sizes may not achieve data saturation, which normally begins to emerge around 12 participants. This suggests that the findings

from these studies might not provide the necessary depth to address various aspects of the relevance of pharmacological knowledge in secondary clinical settings.

In contrast to Scrafton et al. (2012) and Lennon et al. (2018), Boreham et al. (2013) reported positive findings related to the educational preparation for the nurse prescribing role. Boreham et al. (2013) conducted a mixed-methods study in Scotland to evaluate different approaches to nurse prescribing training and the effectiveness of this training in preparing participants for prescribing practice. Multiple methods were used to collect the research data, including an initial survey for training programme participants to identify their age, professional and educational background, and the clinical situations in which they would apply the training. Interviews were conducted with 10 programme leaders or associate leaders. Additionally, focus-group interviews were conducted with nursing students at the end of the training programme. The nursing student participants enrolled in prescribing programmes worked in primary and secondary healthcare settings. The findings from focus groups conducted with nursing students revealed that the programmes were characterised as offering more professional confidence, enabling the provision of greater patient care, broadening the scope of their nursing responsibilities, and promoting improved collaboration with other healthcare professionals, such as general medical practitioners and pharmacists, while other advantages related to the programmes included comprehensiveness and relevance to specific areas of prescribing, and to the incorporation of the context and constraints of nurse prescribing. Furthermore, they acknowledged the program's proficiency in utilising the British National Formulary (BNF), clinical management plans, and other tools available to prescribers. Boreham et al. (2013) also found that programme leaders agreed that the provision of comprehensive pharmacological knowledge was beneficial in enabling nurse prescribers to manage co-morbidities and

interactions with medications that they do not prescribe medications. Comprehensive pharmacological knowledge helped nurse prescribers to utilise their knowledge to offer an improved explanation regarding the different treatment options to patients. However, it is important to note that focus groups may introduce biases since certain individuals may dominate the discussion, potentially influencing outcomes (Gundumogula, 2020). The study attempted to mitigate these limitations by incorporating elements of the nominal group technique, but some biases may still be present.

However, Boreham et al.'s (2013) study included nursing students, and it may thus reflect a more idealised perspective on education, as these students have not yet encountered the practical realities of prescribing in a clinical setting. In contrast, the studies by Scrafton et al. (2012) and Lennon et al. (2018) involved nurse prescribers, who are likely to be more critical and aware of the discrepancies between their educational preparation and the actual demands they face in their prescribing roles. Interpretation of these findings thus necessitates acknowledging the difference between the perspectives of nursing students and those of experienced nurse prescribers.

Watson et al. (2021) conducted a qualitative study to explore the perspectives of nurse prescribers on their educational preparation for the prescribing role. A total of 16 semi-structured interviews with nurse and midwife prescribers. This study found that there were divergent perspectives on whether nurse students should be required to attend a comprehensive pharmacology module or whether their attention should be limited to their specific area of prescribing. Several participants suggested a need to have in-depth knowledge of the pharmacology pertaining to their specific area of

prescribing, while others suggested that pharmacology studies should be sufficiently comprehensive to include all aspects of pharmacological knowledge. The latter acknowledged that the populations they are tending to have undergone changes in their clinical needs and conditions, necessitating various forms of knowledge to meet their prescribing requirements. This suggests that participants' diverse viewpoints in the studies by Scrafton et al. (2012), Boreham et al. (2013), Watson et al. (2021), and Lennon et al. (2018) were influenced by their individual educational preferences, practical experience, and the impact of the clinical setting.

Watson et al. (2021) also investigated the mentorship experiences of nurse prescribers during their prescribing training programmes. Participants were exposed to a diverse range of mentoring experiences, and a number of participants had favourable perceptions of the mentoring process, particularly recognising the support and motivation provided by their mentors. However, several other individuals reported that their mentors saw the process as a routine prerequisite. The study also found that several mentors chose not to participate in any prescribing activities throughout the mentorship period, which participants recognised as a limitation on their learning opportunities. There was also evidence of limited engagement, as some participants noted that some mentors were more approachable than others, and several participants had challenges in even finding appropriate medical mentors.

In contrast, earlier studies carried out by Scrafton et al. (2012) and Hopia et al. (2017) showed positive mentorship experiences. The descriptive qualitative study in Finland carried out by Hopia et al. (2017) explored the facilitators and barriers related to the development of nurse prescribing competence from the perspective of nurses enrolled in a 14-month prescribing programme. To gather the data for the study, online

learning diaries were used. This study found that the nurses reported satisfaction with their mentorship experience, highlighting the valuable role played by doctors who served as mentors during their training. This mentorship was found to enhance the competence of nurse prescribers and instil a sense of confidence in managing patients' healthcare needs. In Hopia et al.'s (2017) study, the main benefit of diary studies is that participants can provide authentic data by documenting their experiences in their own language. This direct reflection strengthens the credibility and dependability of the findings (Olorunfemi, 2024). However, a related major weakness is the potential for incomplete data, as participants may not consistently record all relevant events or reflections, leading to gaps that can skew the findings and limit the accuracy of analysis (Olorunfemi, 2024).

Scrafton et al. (2012) further found that the inclusion of clinical mentorship in prescribing programmes had a positive effect. Scrafton et al.'s (2012) study also emphasised that mentors were supportive, not only in terms of cultivating their prescribing expertise but also in teaching them to effectively implement their learned knowledge and skills in practical situations.

2.4.3.1 Summary

Educational preparation for nurses for the prescribing role is an efficient means to provide them with the expertise they need. The intention of registered nurses to take part in prescribing training is influenced by both contextual and personal factors, as explored by Kelly et al. (2010) and Fox et al. (2023). Courtenay et al. (2006) and Courtenay et al. (2008) that found positive results related to the effectiveness of education among nurses who had trained in certain specialties before undertaking educational preparation for prescribing roles. However, some concerns have been

raised about the relevance of pharmacological knowledge to nurse prescribing areas, and certain challenges were identified in qualitative studies (Scrafton et al., 2012; Lennon et al., 2018). However, the small sample size of these studies necessitates a cautious approach to their findings. It is pertinent to point out that these studies mostly focus on the perspectives and experiences of nurse prescribers, with limited exploration of the perspective of educators on the efficacy of educational programmes in prescribing for preparing nurses to prescribe medications. Nevertheless, there is a dearth of studies that have investigated the influence of the number of years of experience as a registered nurse on nurses' perceptions of the efficacy of prescribing educational programmes and tendency towards taking on educational preparation for the prescribing role.

2.4.4 Organisational factors influencing the implementation of the NP role

This theme highlighted various organisational factors that may act as barriers or facilitators in the implementation of the nurse prescribing role within healthcare settings. This theme can be broken into five sub-themes: 1) support; 2) continuous professional development; 3) accessing electronic systems and prescribing pads; 4) prescribing restrictions; and 5) financial incentives.

2.4.4.1 Support

Thirteen studies examined perspectives on the importance of support in implementing nurse prescribing roles. Out of these studies, eight were quantitative (Courteney et al., 2008b; Lockwood et al., 2008; Naderi et al., 2017; Currie et al., 2018; Zimmermann et al., 2020; Snell et al., 2022; Fox et al., 2022; Almotairy et al., 2023), while four others were qualitative (Stenner et al., 2008; Carey et al., 2010a; Bowskill et al., 2013; Pearson et al., 2020), and one was a mixed methods study (Ross et al., 2012). The

majority of the studies were conducted in the United Kingdom (n = 5), New Zealand (n = 2), with both countries represented (n = 1), along with other studies in Poland (n = 1), Australia (n = 1), Saudi Arabia (n = 1), Iran (n = 1), and Ireland (n = 1).

Three studies have investigated the potential support from leadership to facilitate the implementation of the nurse prescribing role (Lockwood et al., 2008; Ross et al., 2012; Naderi et al., 2017). Two studies examined the necessity of peer support in facilitating the implementation of the nurse prescribing role (Fox et al., 2022; Almotairy et al., 2023). Four studies investigated nurse prescribers' experiences with peer support (Courteney et al., 2008b; Snell et al., 2022; Currie et al., 2018; Zimmermann et al., 2020). Finally, four studies explored nurse prescribers' experiences with clinical supervision as a means of support for their prescribing practice and the factors that facilitate clinical supervision from doctors (Stenner et al., 2008; Carey et al., 2010a; Bowskill et al., 2013; Pearson et al., 2020).

A cross-sectional study by Naderi et al. (2021) investigated nurses' attitudes toward the necessity of nurse prescribing roles in the ICU in Iran. The study surveyed a total of 136 nurses. The results showed that insufficient support from nursing management poses a substantial obstacle to the adoption of the nurse prescribing role. The survey revealed that a total of 109 participants (95.6%) agreed that the reluctance of nursing supervisors can impede nurse prescribing roles. Conversely, only 5 participants (4.4%) indicated disagreement with this statement. An early quantitative study in Ireland conducted by Lockwood et al. (2008) also provided evidence of the need for leadership support. Lockwood et al. (2008) intended to investigate clinical nurse specialists' attitudes toward obstacles to the implementation of nurse prescribing roles. A total of 173 clinical nurse specialists from both primary and secondary care

facilities were surveyed. This study also found that a total of 94 participants (54.4%) agreed that lack of support from nursing leadership was a significant barrier to becoming a nurse prescriber. Although there are contexts and healthcare system distinctions between Iran and Ireland, the results of Lockwood et al.'s (2008) study and Naderi et al.'s (2021) study share similarities in terms of their emphasis on the importance of leadership support in nurse prescribing implementation. However, the results still require cautious interpretation due to differences across the different clinical settings.

Two studies, carried out by Currie et al. (2018) and Ross et al. (2012), expand upon the results of Naderi et al. (2021) and Lockwood et al. (2008) by investigating the actual experiences of nurse prescribers in relation to leadership support. Currie et al. (2018) conducted a quantitative study that explored the factors that both facilitate and impede nurse prescribing among nurses who initiate their prescribing practice. A total of 36 nurse prescribers in general practice participated in the survey. This study found that only 5 participants (16.6%) identified inadequate employer support as an additional significant impediment to the successful implementation of nurse prescribing practice. However, this study utilised a non-validated electronic survey tool and relied on a non-random sampling strategy. Therefore, it is difficult to indicate that these results are reliable or generalisable to other populations and contexts.

Ross et al. (2012) conducted a mixed-methods study in the UK aimed to explore mental health nurse prescribers' views of the barriers to prescribing independently. The study collected data using surveys filled out by 33 individuals combined with interviews with 12 nurse prescribers. The quantitative data thus gathered revealed that a total of 24 participants (72.7%) reported having irregular meetings with their

managers and lead nurse, indicating a lack of support from these individuals in implementing their prescribing practices. A total of 15 participants (62.5%) agreed that the leadership team' support was insufficient to facilitate the implementation of their prescribing practices. These quantitative results align with the qualitative findings, as nurse prescribers revealed frustration with the insufficient support provided by administration teams. Ross et al. (2012) also discovered that nurse prescribers were apprehensive about a lack of awareness of their prescribing responsibilities among lead nurses, which was seen as resulting in an ongoing lack of support for their prescribing practices. This highlights the importance of having administrative support for nurses to allow them to effectively prescribe medications. Without such support, prescribing medications could be difficult for nurses. A key strength of the study was its use of multiple data collection methods. The consistency observed in both quantitative and qualitative data enhances the validity of the findings and supports their robustness and reliability (Creswell et al., 2017).

Almotairy et al.'s (2023) cross-sectional study investigated nurses' readiness to prescribe medications under supervision among nurses in different settings in Saudi Arabia. A total of 379 nurses from various healthcare and non-healthcare contexts participated. The study revealed that 160 participants (42.2%) agreed that support from medical professionals is a crucial facilitator for implementing nurse prescribing roles, with 107 participants (28.2%) strongly agreeing. Support from pharmacy colleagues was similarly agreed as a crucial facilitator by 164 participants (43.3%), with 101 participants (26.6%) strongly agreeing. Support from nursing colleagues was also agreed as a vital facilitator by 171 participants (45.1%), with 101 participants (26.9%) strongly agreeing.

A cross-sectional study carried out by Fox et al. (2022) also investigated nurses' readiness to prescribe medications under supervision. The study data was collected through an online survey, in which 4,424 registered nurses participated. This study found that 1,159 out of 4,424 participants (26.4%) agreed that support from the medical profession is an important facilitator for nurse prescribing practice, with 2,693 participants (61.4%) strongly agreeing. Support from colleagues in pharmacy was agreed upon by 1,237 participants (28.3%) and strongly agreed upon by 2,631 participants (60.2%). Support from the nursing profession was similarly agreed upon by 1,687 out of 4,424 participants (38.6%) and strongly agreed upon by 2,272 participants (52%).

In both Almotairy et al. (2023) and Fox et al. (2022), participants suggested that support from all colleagues across the medical professionals, pharmacy, and nursing professions was widely recognised as an important facilitative factor. However, the differences in levels of agreement emphasise the existence of various perceptions regarding necessity for support. This variation suggests that nurses in these two countries may have differing views of the necessity of support from medical professionals and other healthcare providers when implementing their prescribing role. However, Almotairy et al. (2023) and Fox et al. (2022) used convenience sampling (non-probability sampling). Participants may self-select based on their availability or willingness, which can lead to selection bias (Etikan et al., 2016). This may in turn impact the validity of conclusions derived from studies, making it imperative to exercise caution when interpreting the results of such studies.

A quantitative study carried out by Snell et al. (2022) compared diabetes-related prescribing practices, barriers and facilitators among nurse prescribers in New

Zealand and the UK. Snell et al. (2022) surveyed 250 nurses prescribing within diabetes care, with 111 from New Zealand and 139 from the UK. The study showed that 21 (19.8%) and 14 (15.1%) of nurse prescribers agreed that inadequate peer support was a barrier to their prescribing role in the United Kingdom and New Zealand, respectively. However, this study used an opportunistic sampling approach, which is dependent on the availability of participants (Prayudi et al., 2019). Consequently, the results of this study may not accurately reflect the entire population of nurse prescribers in both countries, thus restricting their generalisability.

However, quantitative study conducted by Courtenay et al. (2008b), which aimed to provide an overview of nurse independent prescribing and supplementary prescribing in the UK. A total of 1,400 (70%) questionnaires were returned, with 1,377 completed. The study also revealed that 126 independent nurse prescribers (13.4%) and 92 supplementary nurse prescribers (14.2%) agreed that a lack of peer support was a barrier to engaging in prescribing practice. This study's strength was its robust sampling approach, which used random sampling with a 70% response rate, which may enhance the generalisation of these results. Snell et al. (2022) and Courtenay et al. (2008b) saw nurse prescribers cite a dearth of peer support as an obstacle at a rate of around 15% to 20%. This indicates that, although nurse prescribers mentioned a lack of peer support as an obstacle, this may not be the primary factor limiting them from implementing their prescribing responsibilities.

A national cross-sectional study by Zimmermann et al. (2020) aimed to assess the current situation of nurse prescribers in Poland. A total of 819 nurses and midwives who were training to become independent prescribers participated in a survey in Poland. In this study, a total of 227 participants (27.7%) reported that a lack of

continuous support significantly hindered their ability to prescribe, particularly for newly qualified nurse prescribers. This study found that newly qualified nurse prescribers appear especially exposed to the difficulties posed by inadequate ongoing support. However, Zimmermann et al.'s (2020) study had a response rate of 54.6%, which is considered satisfactory. Quantitative studies with a limited sample size generally consider a response rate of 44% acceptable (Wu et al., 2022). This indicates that the results of Zimmermann et al.'s (2020) study can be reliable and presentative for the study population.

Also, qualitative studies explored nurse prescribers' experiences with continuous support. Carey et al. (2010a) conducted a qualitative study that explored the perspectives of nurse prescribers and other stakeholders regarding the impact of the nurse prescribing role on dermatology services. The interviews included nurse prescribers (n = 11), physicians (n = 12), administrative staff (n = 11), and non-nurse prescribers (n = 6). The study revealed that a small number of nurse prescribers had the opportunity to engage in clinical supervision regularly. However, other nurse prescribers reported that they were unable to arrange or suspend clinical supervision. This study further highlighted the significance of ongoing clinical supervision for supporting nurse prescribers' prescriptive practices. However, the study involved nurses who prescribe medications in dermatology clinics. In qualitative research, the selection of specific participant groups could generate findings that are not transferable to other groups in various contexts (Drisko, 2024). Therefore, the findings of Carey et al.'s (2010a) study may not be entirely transferable to other healthcare contexts.

Similar findings were also reported by a qualitative study conducted by Stenner et al. (2008), which explored nurse prescribers' perspectives on the role of inter-professional relationships and other means of support for nurse prescribers who prescribe medications for patients in acute and chronic pain. A total of 26 semi-structured interviews were conducted with nurse prescribers. These nurse prescribers indicated that regular clinical supervision sessions were essential in providing them with support to address challenging cases, update knowledge, and improve their confidence in prescribing. However, the organisation and structure of clinical supervision varied greatly, ranging from well-planned and consistent sessions to infrequent and unprepared arrangements. While certain nurses had the chance to discuss matters with a clinician as they arose, not all nurses had formal and regular clinical supervision sessions, indicating a potential gap in support for nurse prescribers. The study highlighted the potential lack of formal and regular clinical supervision for nurse prescribers, which could potentially hinder their ability to manage challenging patients. The strength of Stenner et al.'s (2008) study is largely due to the inclusion of 26 nurse prescribers, which potentially enhances the richness of their findings (Vasileiou et al., 2018). However, Stenner et al.'s (2008) study narrowed its focus to the experiences of nurses who prescribe pain medications. This may potentially limit the transferability of its findings to different clinical settings (Drisko, 2024).

Evidence from studies conducted by Stenner et al. (2008) and Carey et al. (2010a) indicates that a significant obstacle is the absence of regular clinical supervision from doctors and an organisational structure that guarantees the provision of consistent clinical supervision and support. This highlights the need for healthcare organisations to implement mechanisms that support regular and appropriate clinical supervision, as

this is a crucial facilitative factor in supporting the responsibilities of nurse prescribing.

A qualitative study carried out by Pearson et al. (2020) in New Zealand explored nurse prescribers' experiences. A total of 16 semi-structured interviews were conducted with nurse prescribers working in varied clinical settings. The participants highlighted the importance of establishing positive relationships among the multidisciplinary team (MDT) to facilitate clinical supervision support, especially from medical professionals. In addition, they revealed that the relationship with medical professionals often needed a considerable length to develop, and it also depended on trust among them. The main strength of this study is a sufficient sample size, which may improve both the depth and credibility of the findings (Boddy et al., 2016).

Bowskill et al. (2013) conducted a qualitative study to explore the factors that influenced the integration of the nurse prescribing role. A total of 26 interviews were conducted with nurse prescribers working in primary and secondary healthcare settings. Their findings are in line with those of Pearson et al. (2020); they also highlight that establishing strong, trusting relationships with medical professionals was a key factor in facilitating clinical supervision from medical professionals for their prescribing practice. This study highlighted the crucial importance of trust and a comfortable relationship between medical professionals and nurses as factors that supported the integration of their prescribing practice. Participants emphasised that without trust, nurses would not be able to prescribe medications. The study's strength lies in its large sample size, which ensured the inclusion of diverse cases representing

various characteristics related to the clinical role of nurse prescribers. This may enhance the credibility of these findings (Vasileiou et al., 2018).

It is evident that the results from quantitative studies necessitate support for the nurse prescribing role from administrative teams, medical professionals, and colleagues. A low percentage of nurse prescribers reported that the lack of peer support was an obstacle, indicating that it is not the primary factor hindering them from fulfilling their prescribing responsibilities. The findings of qualitative studies frequently demonstrate the critical importance of clinical supervision by medical professionals in supporting nurse prescribers. However, trust and positive relationships between medical professionals and nurses are essential for facilitating effective clinical supervision.

2.4.4.2 Continuous professional development

Nine studies explored nurse prescribers' experiences of accessing continuing professional development (CPD). Four of which were quantitative studies (Courteney et al., 2007; Carey et al., 2010b; Smith et al., 2014; Snell et al., 2021), and five were qualitative studies (Stenner et al., 2010; Carey et al., 2010a; Cousins et al., 2012; Scrafton et al., 2012; Watson et al., 2021). The majority of the studies took place in the UK (n = 7), in both the UK and New Zealand (n = 1), and in Ireland (n = 1).

Four studies investigated the accessibility of professional development opportunities for nurse prescribers (Courteney et al., 2007; Carey et al., 2010b; Smith et al., 2014; Snell et al., 2021). Two studies explored the challenges faced by nurse prescribers in accessing CPD related to their prescribing practice areas (Cousins et al., 2012;

Scrafton et al., 2012). Three studies focused on exploring the available CPD resources for nurse prescribers (Stenner et al., 2010; Carey et al., 2010a; Watson et al., 2021).

Snell et al. (2022) carried out a quantitative study to compare the diabetes-related prescribing practices, barriers, and facilitators among nurse prescribers in the UK and New Zealand. Of the 250 nurses surveyed, 111 were from New Zealand and 139 were from the United Kingdom. In the UK, 106 participants (96.5%) were able to access ongoing professional development, compared to 91 participants (96.8%) in New Zealand. The high rates of access to ongoing professional development among nurse prescribers both in the UK and New Zealand suggest that these healthcare systems have established robust mechanisms to support nurse prescribers' continuing education and skill development. However, a limitation of Snell et al.'s (2022) study was the lack of exact knowledge about the number of nurses authorised to prescribe medications for diabetic patients in both countries, which hindered the calculation of the overall response rate. This may make it difficult to determine whether the sample represents the broader population.

Courtenay et al. (2007) conducted a national survey study to investigate the factors that either facilitate or inhibit the prescribing practices of independent extended/supplementary nurse prescribers. The study involved 868 qualified independent extended/supplementary nurse prescribers across the UK. They found that 505 participants (58%) were able to engage in continuous learning (CPD); however, a further 277 nurse prescribers (32%) experienced difficulties in accessing continuous learning. The results also demonstrated the continuing professional development (CPD) needs of nurses working in a diverse array of care settings. Nurse prescribers in primary care needed to access CPD more than those working in

secondary care. A total of 398 nurse prescribers (24.3%) reported that they needed updates on prescribing policy. A total of 331 nurse prescribers (20.2%) reported that they needed updates on treatment and management of conditions. A total of 283 nurse prescribers (17.3%) indicated a need for updates in pharmacology. Furthermore, 288 nurse prescribers (17.6%) indicated a need for training in assessment and diagnostic competencies.

The study additionally provided a description of the average number of CPD needs that nurses report in relation to their practice setting. The mean CPD count needed by primary care nurse prescribers was 2.76, while those in both primary and secondary care reported a mean of 2.54. In contrast, nurses in secondary care reported notably lower CPD needs, with a mean of about 1.97, implying that nurses in primary care face greater demands for professional development to effectively support their prescribing practice. This implies that nurses in primary care face greater demands for professional development to effectively support their prescribing practices. However, this study did not report the reasons behind nurse prescribers' limited accessibility to CPD. Furthermore, the use of the convenience sampling approach (non-probability sampling) may have limited the representativeness of the study population (Andrade, 2021).

In a quantitative study carried out by Carey et al. (2010b), CPD needs among nurses who prescribed medications to patients with diabetes were investigated. A total of 439 independent nurse prescribers and supplementary nurse prescribers working in primary and secondary care participated in the survey. In contrast to the study conducted by Courtenay et al. (2007), Carey et al. (2010b) found that a total of 357 nurse prescribers (83.4%) were able to access CPD, with only 71 nurse prescribers

(16.2%) reporting restricted access to CPD. Nevertheless, it is crucial to analyse these results critically, especially in terms of the differences in the sizes of the samples. Courtenay et al. (2007) had a larger sample size, which means it is more likely to accurately reflect the availability of CPD among nurse prescribers. This suggests that the concerns noted in Courtenay et al.'s (2007) study may be more common in reality than suggested by the more positive results seen in Caray et al.'s (2010b) study. While the latter thus provides a positive perspective, it may not fully capture the challenges faced by the broader nurse prescriber regarding CPD access.

Carey et al. (2010b) also conducted a more thorough investigation into the reasons for the lack of access to CPD, an area that Courtenay et al. (2007) overlooked entirely. Participants were also requested to provide an explanation for the reasons they were unable to access CPD. There were fifty-seven responses; 48 participants (84%) reported no access due to a lack of funding or facilities, while only 9 participants (16%) attributed this to the workload or timing of the sessions.

Carey et al. (2010b) explored the relationship between participants recognising their CPD needs and their job title. For general practice nurses, 247 out of 271 nurses (91.1%) reported having access to CPD; only 24 general practice nurses (8.9%) indicated that they did not access CPD. Similarly, a total of 56 out of 63 community nurses (88.9%) had access; only 7 community nurses (11.1%) did not access CPD. For secondary care nurses, 66 out of 72 nurses (86.6%) reported that they were able to access CPD, and only 10 secondary care nurses (13.2%) experienced difficulties accessing CPD. A total of 18 senior nurses and managers (81.8%) were able to access CPD, and only 4 (18.2%) did not access CPD.

The relationship between participants recognising their CPD needs, their grade/band, and their areas of prescribing was also investigated. A total of 104 out of 115 nurse prescribers (90.4%) in the E/5, F/6/G, and G grades were able to access CPD. However, 24 out of 194 nurse prescribers (12.4%) in the H/7 grade required further access to CPD. A total of 10 out of 101 nurse prescribers (9.9%) in grades I/8 and 9 needed greater access to CPD. In primary care, a total of 330 out of 364 nurse prescribers (90.9%) reported engaging in CPD, and 34 out of 42 nurse prescribers (81.0%) in secondary care were able to engage in CPD. However, 23 out of 26 nurse prescribers (88.5%) who worked in both primary and secondary care indicated that they needed to participate in CPD.

The results indicated that there was insufficient evidence that the percentage of participants with CPD needs varied to a significant degree across all three variables (job title, grade/band, areas of prescribing) ($p = 0.428$, $p = 0.691$, $p = 0.147$, respectively). However, these results came from a sample of nurses who only prescribed medications for diabetic patients; therefore, it is essential to consider the context and sample characteristics to assess the applicability of the results to different groups or settings.

A cross-sectional survey conducted by Smith et al. (2014) investigated the availability of continuing professional development for non-medical prescribers. A total of independent nurse prescribers ($n = 976$) across primary and secondary care who prescribe medication for a wide range of health conditions participated in alongside leaders ($n = 87$). All independent nurse prescribers used different approaches to stay updated about their prescribing practices. The majority of 658 independent nurse prescribers (78%) concurred that their directorate or department supported their CPD.

This included study leave, in-house training courses, which were agreed upon by 599 independent nurse prescribers (71%), and access to a budget for external training courses, which was agreed upon by 492 independent nurse prescribers (58%).

Like the results from the study carried out by Carey et al. (2010b), there was no statistically significant correlation between the job title of independent nurse prescriber and the reported insufficient access to CPD. However, a collective group (n = 96) of district nurses, health visitors, and community matrons reported inadequate access to CPD. These results offer further evidence that the job title of independent nurse prescriber does not have a significant impact on whether the participant has adequate access to CPD. However, the study did not investigate the reasons for the differences in CPD access among subgroups. Overall, the primary strengths of the study were the use of random sampling and the response rate of 65%, which may contribute to increased generalisability of results (Asiamah et al., 2022; Wu et al., 2022).

The accessibility of CPD among nurse prescribers was also investigated by many qualitative studies. A qualitative study carried out by Watson et al. (2021) explored nurse and midwife prescribers' perceptions about their CPD. A total of 16 nurse prescribers working in the maternity setting were interviewed, including advanced practitioners (n = 8), clinical midwife specialists (n = 4), and those with clinical management roles (n = 4). The individuals interviewed had prescribing experience ranging from four months to nine years. The participants generally maintained active roles in their CPD by engaging in activities such as studying journal articles and actively participating in conferences, as evidenced by a considerable number of participants. They also generally considered prescribing to be a form of professional

growth that would enhance their competences in prescribing practice. However, several participants said that their engagement in formal CPD sessions was limited, attributing their lack of involvement to time limitations as well as poor guidance from their organisations. These findings suggest that, even though nurse prescribers' individual motivations to improve their knowledge and abilities are commonly strong, various organisational challenges may make it difficult for them to take advantage of CPD opportunities. A significant strength of the study was its inclusion of nurse prescribers with varying levels of prescribing experience, ranging from four months to nine years, which enabled the gathering of opinions from nurse prescribers at different stages of their prescribing practice development.

Cousins et al.'s (2012) qualitative study explored nurse prescribers' perspectives on the factors that facilitate or inhibit their prescribing practice. A total of six semi-structured interviews were conducted with nurse prescribers in general practice. These participants further highlighted the need for CPD and the need to stay updated in their respective areas of prescribing practice. However, the participants shared the idea that the lack of a formal system to keep them updated was a barrier that hindered their ability to expand their knowledge and competencies in the prescribing role. Similar findings were reported by Scrafton et al. (2012), who explored nurse prescribers' experiences in relation to their prescribing roles in secondary care. A total of 6 in-depth interviews were conducted. This study suggested that the absence of a formal national infrastructure to guide CPD activities resulted in frustration among nurse prescribers. Scrafton et al.'s (2012) study highlighted inadequate dissemination of information related to CPD. These findings also indicate that it is thus crucial to address the organisational gaps seen in supporting the ongoing professional

development of nurse prescribers to guarantee that nurse prescribers can maintain their skills and keep their knowledge up to date.

Stenner et al. (2010) conducted a qualitative study to explore perspectives on the implementation of nurse prescribing roles in diabetes services. The study involved conducting 31 semi-structured interviews with qualified nurse prescribers, administrative staff, physicians, and non-nurse prescribers. This study revealed that nurse prescribers had access to various facilities for CPD, including journal clubs and local prescribing groups. Training was also available at a local level, and several nurses reported that this was excellent. These findings are in line with a qualitative study carried out by Carey et al. (2010a) that explored perspectives on the impact of the nurse prescribing role on dermatology services. Semi-structured interviews were conducted with 11 nurse prescribers, 12 doctors, 11 administrative workers, and six non-nurse prescribers. This study found that nurse prescribers experienced access to a variety of supportive mechanisms for updating their knowledge, including specialist networks, internet services, journals and conferences.

The findings of Stenner et al. (2010) and Carey et al. (2010a) indicate that nurse prescribers do have access to structured and supportive CPD resources in certain contexts (diabetes and dermatology). This contrasts with the barriers and frustrations reported in the studies conducted by Cousins et al. (2012) and Scrafton et al. (2012). However, as Stenner et al. (2010) and Carey et al. (2010a) only interviewed nurse prescribers in particular services (diabetes and dermatology), a broader interpretation of the findings should be approached with caution, as they may not have captured CPD accessibility across different areas of nurse prescribing practice.

The evidence from quantitative studies revealed that nurse prescribers generally have high access to continuing professional development (CPD); however, some nurse prescribers in primary healthcare settings placed a greater emphasis on the necessity of enhanced access to CPD. Additionally, quantitative studies indicated that there was no statistically significant correlation between the job title of an independent nurse prescriber and the reported lack of access to CPD. A variety of qualitative studies have highlighted the different approaches to accessing CPD for nurse prescribers. Nevertheless, the lack of formal systems to facilitate access to CPD and organisational challenges present significant obstacles.

2.4.4.3 Access to electronic systems and prescribing pads

Seven studies investigated organisational factors related to the availability of electronic systems (generating electronic prescriptions and accessing patient records) and prescription pads. Four studies were quantitative studies (Courtenay et al., 2007; Courteney et al., 2008b; Snell et al., 2022; Casey et al., 2020); two were qualitative studies (Stenner et al., 2010; Maddox et al., 2016); and the remaining study employed a mixed methods study (Coull et al., 2013). The majority of the studies were conducted in the UK (n = 5), in both the UK and New Zealand (n = 1), and in Ireland (n = 1).

Six studies investigated nurse prescribers' experience with access to electronic systems and prescribing pads (Courtenay et al., 2007; Courteney et al., 2008b; Snell et al., 2022; Stenner et al., 2010; Maddox et al., 2016; Casey et al., 2020). One study explored the factors relating to the difficulties experienced by nurse prescribers in obtaining prescription pads and accessing patients' records (Coull et al., 2013).

Snell et al. (2022) conducted a quantitative study to investigate the impediments and facilitators among nurse prescribers who prescribe diabetic patients in New Zealand and the UK. The study surveyed a total of 250 nurse prescribers from New Zealand (n = 111) and the United Kingdom (n = 139). This study found that 10 nurse prescribers (9.3%) from the UK and 7 nurse prescribers (7.4%) from New Zealand had difficulty utilising computer-generated systems or obtaining prescription pads. Some nurse prescribers in the UK and New Zealand also experienced challenges in accessing patients' records, with a total of 22 participants (20.6%) and 15 participants (16.1%), respectively. The results overall suggest that the percentages of respondents experiencing such problems are comparatively low, particularly as difficulties with systems and prescribing pads, impacted less than 10% of nurse prescribers in both countries. However, the percentages of nurse prescribers who experienced significant obstacles in accessing patient records were higher in both countries; they remained below 25%. These results did indicate that prescribing-related challenges may be experienced to a comparable extent across the two healthcare systems.

A national survey study carried out by Courtenay et al. (2008b) aimed to provide an overview of nurse supplementary prescribing and nurse independent prescribing in the United Kingdom. A total of 1,377 nurse prescribers completed questionnaires. Courtenay et al. (2008b) found that 575 out of 938 independent nurse prescribers (61.30%) were unable to generate computer prescriptions, while a total of 619 independent nurse prescribers (66.0%) found restrictions on local arrangements (delays in receiving prescribing pads). The results also indicated that 227 out of 649 supplementary nurse prescribers (42.7%) experienced difficulty accessing computer prescriptions, while a total of 303 supplementary nurse prescribers (46.7%) experienced restrictions on local arrangements (delays in prescribing pads).

A quantitative study by Courtenay et al. (2007) aimed to identify factors that either facilitated or inhibited independent extended/supplementary nurse prescribers. This study included 868 qualified independent extended/supplementary nurse prescribers. In contrast to Courtenay et al. (2008b), Courtenay et al. (2007) investigated these obstacles, such as the ability to access electronic prescriptions and prescribing pads in accordance with job title. They found that a total of 615 general practice nurses faced obstacles, with 108 (17.6%) citing a lack of prescription pads and 128 (20.8%) dealing with difficulties with electronically generating prescriptions. Of the 113 senior nurses asked, 21 (18.6%) reported a lack of prescription pads, and 13 (11.5%) experienced challenges with electronic generation prescriptions. Similarly, of 314 specialist nurses, 56 (17.8%) experienced a lack of prescription pads, while 41 (13.1%) reported difficulties with electronic generation of prescriptions. Conversely, among the 65 community nurses surveyed, 16 (24.6%) experienced prescription pad shortages, and only 7 (10.8%) had difficulties with electronic prescription generation. This study revealed that 201 out of 1,107 participants (18.2%) reported being unable to access prescription pads, and 189 out of 1107 participants (17%) experienced difficulties generating computer prescriptions.

Courtenay et al. (2007) reported a relatively low percentage of challenges related to prescription pads and computer generation. Snell et al. (2022) also found a lower percentage of nurse prescribers reporting such barriers. In contrast, Courtenay et al. (2008b) indicated that a substantially higher percentage of nurse prescribers were experiencing difficulties associated with local arrangements (such as delays in obtaining prescribing pads) and computer prescriptions at that time. This suggests that the challenges faced by nurse prescribers have either gradually expanded or that the context in which they operate has become more difficult. However, a limitation of

Courtenay et al.'s (2007) study is its reliance on a convenience sampling strategy. In addition, Snell et al.'s (2022) study has certain limitations, including a smaller sample size and the use of an opportunistic sampling strategy. Courtenay et al.'s (2008b) study utilised a random sampling strategy, which could potentially enhance the study populations' representation.

A cross-sectional survey study conducted by Casey et al. (2020) investigated the factors enabling and hindering nurse prescribing practice. A total of 84 nurse and midwife prescribers participated. The qualitative data from the open-ended questions included in the survey revealed obstacles to accessing patient records among participants, particularly regarding patients' medication histories. This led to an inability to identify potential medication interactions. The absence of a comprehensive medication history, which exacerbated risk, emphasised the critical necessity of nurse prescribers having access to patient records in all prescribing contexts. This study emphasised the importance of using electronic systems to access patient records.

Qualitative studies by Maddox et al. (2016) and Stenner et al. (2010) reported similar findings. Maddox et al. (2016) explored the factors influencing the decisions of non-medical prescribers (NMPs) in community and primary care settings. A total of 20 semi-structured interviews were conducted with 15 nurses and five pharmacists. Three focus groups were also conducted with 10 nurses. This study identified the absence of access to patient records as an important obstacle to the effective decision-making of NMPs. This was a significant problem because elderly patients were frequently unaware of their own medical histories, which impeded the nurses' ability to make informed prescribing decisions. NMPs working in other healthcare settings

such as clinics, walk-in centres, and community practices faced this problem. Overall, NMPs in general practice (GP) settings reported fewer problems with accessing patient records. The main strength of the study was that it conducted three focus groups with ten additional nursing participants to validate the findings from the individual interviews. This is likely to have increased the credibility and dependability of the conclusions drawn from the study (Gundumogula, 2020).

Stenner et al. (2010) conducted a qualitative study that explored the perspectives of nurses and team members on the implementation of nurse prescribing in diabetes services. The study consisted of 31 semi-structured interviews with administrative staff, physicians, non-nurse prescribers, and nurse prescribers. In the early stages of their prescribing practice, nurse prescribers revealed challenges related to inadequate computer systems and difficulties in accessing prescribing pads; however, they reported that these challenges generally resolved over time. This suggests that the challenges faced by nurse prescribers were primarily an initial hurdle in the implementation of their prescribing role.

The similar findings of Stenner et al. (2010), Maddox et al. (2016), and Casey et al. (2020) strengthen their overall findings and offer strong evidence regarding the challenges experienced by nurse prescribers, particularly those related to accessing patient records. However, none of these three studies explored the fundamental causes of these barriers.

A mixed-methods study conducted by Coull et al. (2013) assessed the implementation and operation of nurse prescribing in Scotland between 2001 and 2006. The researchers conducted six case studies, involving in-depth interviews with nurse prescribers, patients, doctors, pharmacists, and other health professionals who

collaborated with nurse prescribers in various settings. The findings from Coull et al.'s (2013) study revealed that various administrative barriers, including challenges related to budgetary allocation, led to delays in obtaining prescription pads and accessing the computerised system to issue prescriptions.

In quantitative studies, it is evident that nurse prescribers encounter difficulties in obtaining essential resources, such as electronic systems for generating electronic prescriptions and accessing patient records, as well as prescription pads. However, only a small percentage of nurse prescribers reported facing these challenges. Qualitative studies emphasised that these difficulties often arise during the initial stages of implementation of the nurse prescribing roles. Additionally, qualitative findings highlighted the importance of overcoming these difficulties to prevent negative impacts on the quality of care and the informed decisions made by nurse prescribers.

2.4.4.4 Prescribing restriction

Nine studies explored the perspectives pertaining to the scope of nurse prescribing practice. Two of the studies were quantitative (Fox et al., 2022; Almotairy et al., 2023), while seven were qualitative (Stenner et al., 2008; Scrafton et al., 2012; Bowskill et al., 2012; Maddox et al., 2016; Lim et al., 2017; Pearson et al., 2020; Canet-Vélez et al., 2023). These studies were carried out in a variety of nations, including the United Kingdom (n = 4), New Zealand (n = 2), Spain (n = 1), Australia (n = 1), and Saudi Arabia (n = 1).

Two studies explored registered nurses' attitudes toward unrestricted prescribing practice (Fox et al., 2022; Almotairy et al., 2023). Seven studies investigated nurse prescribers' experiences with their scope of prescribing practice (Stenner et al., 2008;

Scrafton et al., 2012; Bowskill et al., 2012; Maddox et al., 2016; Lim et al., 2017; Pearson et al., 2020; Canet-Vélez et al., 2023).

Almotairy et al. (2023) conducted a cross-sectional study to investigate registered nurses' readiness to prescribe medications under supervision in Saudi Arabia. The study included 379 nurses from various settings, including non-healthcare settings. A total of 144 participants (38.0%) agreed, and 88 (23.2%) strongly agreed that unrestricted prescribing based on a clear scope of practice would facilitate the implementation of the nurse prescribing role. However, 46 participants (12.1%) disagreed, and 11 participants (2.9%) strongly disagreed. Statistical analysis revealed a chi-square value of 133.10, with a p-value of less than 0.001, suggesting that a clear majority of the nursing participants agreed with the idea of unrestricted prescribing based on a clear scope of practice.

Fox et al. (2022) conducted a cross-sectional study in Australia to investigate registered nurses' readiness to prescribe medications under supervision. A total of 4,424 registered nurses from various healthcare settings participated. A total of 1,423 participants (32.6%) agreed, and 1,487 (34.1%) strongly agreed that unrestricted prescribing based on a clear scope of practice would facilitate implementation of the nurse prescribing role. In contrast, a total of 382 participants (8.8%) disagreed, while 101 (2.3%) strongly disagreed. The mean score for this statement was 2.87, with a standard deviation of 1.05, indicating that participants generally held a neutral to slightly positive attitude toward unrestricted prescribing within a defined scope of practice.

This suggests that Saudi Arabian nurses prioritise the significance of unrestricted prescribing, as demonstrated in Almotairy et al.'s (2023) study, more than Australian

nurses, as shown in Fox et al.'s (2022) study. Overall, the results indicate that a significant number of nurses in both countries acknowledge the importance of unrestricted prescribing within a defined scope of practice as a critical factor in achieving effective implementation of nurse prescribing roles.

Stenner et al. (2008) conducted a qualitative study to explore the perspectives of nurse prescribers on means of support for their prescribing practice. Overall, 26 semi-structured interviews were conducted with nurse prescribers practicing in acute and chronic pain settings. This study emphasised the significance of upholding a balanced strategy to restrict the scope of nurse prescribing practice, as well as the ongoing discussion about the appropriate level of regulation for such practice within organisations. Stenner et al. (2008) revealed that participants recognised the significance of local formulary constraints in facilitating the safe prescribing decisions of nurses. However, participants also highlighted the need to avoid stringent policies that might involuntarily impede nurse prescribers. This implies that the most efficient means of governing nurse prescribing may involve a balanced approach that gives nurse prescribers autonomy to exercise their clinical decision-making capabilities and expertise while simultaneously providing a structured foundation of policies and guidelines. This makes it necessary for healthcare organisations to engage in ongoing negotiations and collaborative efforts to ensure that the scope of nursing prescribing practice evolves in accordance with the needs of patients and experiences of nurse prescribers.

A qualitative study carried out by Canet-Vélez et al. (2023) attempted to capture the experiences of nurses during the implementation of nurse prescribing in the province of Barcelona, Spain. They conducted a total of 28 semi-structured individual

interviews and two discussion groups with accredited nurse prescribers in primary healthcare settings. The majority of participants (n = 15) had less than one year of prescribing experience, whereas only four participants had worked as legal nurse prescribers for a full year. The participants involved in the discussion groups revealed that the list of medicines and devices that nurses can prescribe is very restrictive and incomplete. Furthermore, in some situations, such as emergencies, home care, or care for chronic patients, the nurse's word is not final, and a physician must sign off on the prescription.

Scrafton et al. (2012) and Pearson et al. (2020) reported similar findings across different countries. Pearson et al. (2020) conducted a qualitative study to gain insight into perspectives on the factors that facilitate and hinder nurse prescribing in New Zealand. A total of 16 semi-structured interviews were conducted with nurse prescribers working in primary and secondary settings. The majority of participants (n = 8) had less than one year's experience in a prescribing role, while only six had experience ranging from one to two years, and only two participants had more than two years of experience in prescribing. The findings further emphasised nurses' frustration, with participants conveying dissatisfaction with outdated and incomplete formulary that restricted their choices as prescribers and led them to depend on other medical professionals to prescribe medications beyond the formulary's scope.

Scrafton et al. (2012) conducted a qualitative study to explore secondary care nurses' experiences with their nurse prescribing practices in general practice. A total of six in-depth interviews were conducted with specialist nurses who had recently integrated the prescribing role into their practice. They also found that nurse prescribers experienced several limits within the National Prescribing Formulary (NPF),

including condition-specific restrictions, which caused them to depend on patient group directions (PGDs) to cover the limitation in their prescribing authority. However, all participants were very experienced specialist nurses in their fields; their experiences may not represent those of prescribing nurses in general practice.

Qualitative studies conducted by Maddox et al. (2016), Bowskill et al. (2012), and Lim et al. (2017) revealed contrasting findings. Lim et al. (2017) conducted a qualitative study to explore nurse practitioners' experiences with prescribing roles in New Zealand. A total of ten semi-structured individual interviews were conducted with nurse practitioners who prescribe in primary and secondary care. Only four participants had less than two years of prescribing experience, while six had more than two years. Lim et al. (2017) found that nurse prescribing practice primarily focused on commonly prescribed medications within their specific clinical practice area. Patient safety remained a constant concern, and they consistently emphasised the importance of adhering to "safe practice" principles, which included practicing within a designated area of expertise, setting personal boundaries, and staying within self-imposed limits.

Maddox et al. (2016) conducted a qualitative study to explore the factors influencing the decisions of individuals responsible for prescribing practice in the UK. A total of 20 semi-structured interviews were conducted with in which fifteen nurses and five pharmacists. Additionally, three focus groups were conducted with nurses working in primary care and community settings. The majority of nursing prescribers (n = 14) had more than five years of experience, ten participants had between six and eight years, and one participant had more than eight years. This study also revealed that some nurse prescribers showed reluctance to assume prescribing responsibilities

beyond their areas of expertise and limitations. They attributed their cautious approach to prescribing to factors such as patient safety risks and legal considerations, especially when dealing with off-label medication and high-risk medications. In such situations, participants either chose to refer the patient to another healthcare professional or engaged in collaborative decision-making with a doctor to ensure appropriate prescribing practices.

A qualitative study undertaken by Bowskill et al. (2013) sought to explore factors impacting the integration of the nurse prescribing responsibilities in the UK. The study conducted a total of 26 semi-structured interviews with qualified nurse prescribers working in primary and secondary settings. Of these, five participants had not yet engaged in prescribing practice. The participants in this study had all obtained the necessary qualifications to prescribe for a period ranging from 7 to 26 months. They noticed that although nurse prescribers were only slightly restricted in their prescribing formulary, they tended to self-restrict prescribing practice based on their clinical competence, claiming that having a wide range of prescription options raised significant threats for both them and their patients. This self-imposed constraint stemmed from the need to protect patient safety. The findings indicated that nurse prescribers in a variety of healthcare systems have demonstrated the significance of self-restricting prescribing to ensure patient safety (Lim et al., 2017; Maddox et al., 2016; and Bowskill et al., 2012). Thus, the consistent emergence of these findings across a diverse array of healthcare systems in different countries strengthens their credibility.

Nevertheless, variations within the research suggest that the experiences and viewpoints of nurse prescribers may be more varied. Some nurse prescribers may be

frustrated by their limited prescribing authority, as discussed in the studies by Canet-Vélez et al. (2023), Pearson et al. (2020), and Scrafton et al. (2012). However, some nurse prescribers prioritise patient safety and adhere strictly to their specific areas of expertise, even if this necessitates collaboration with other healthcare professionals or imposes their own limitations, as demonstrated by studies conducted by Lim et al. (2017), Maddox et al. (2016), and Bowskill et al. (2012). Scrafton et al. (2012), Pearson et al. (2020), and Canet-Vélez et al. (2023), involving nurse prescribers with relatively less experience in prescribing as compared to those participating in Lim et al. (2017), Maddox et al. (2016), and Bowskill et al. (2012) studies, with the latter having many more years of experience in prescribing. Supporting prescribing within limits with a focus on patient safety among nurses with enough experience in this role may show that nurse prescribers are becoming more mature and aware, leading to a more responsible and safety-conscious prescribing approach. This indicated the importance of considering the experience level of nurse prescribers when interpreting the findings.

Quantitative studies clearly demonstrate that registered nurses recognise the importance of unrestricted prescribing within a specific practice area as a crucial facilitator for implementing the nurse prescribing role. Qualitative studies that included nurse prescribers revealed a diverse array of findings. Some studies indicated that nurse prescribers were dissatisfied with restrictive formularies, the necessity of physician signatures, and patient group directions, while other studies found that nurse prescribers prioritised patient safety by establishing self-imposed limitations in their prescribing practices.

2.4.4.5 Financial incentives

Nine studies investigated the financial incentives associated with the responsibilities of a nurse prescriber. Four quantitative studies (Currie et al., 2018; Zimmermann et al., 2020; Fox et al., 2022; Almotairy et al., 2023), three qualitative studies (Cousins et al., 2012; Lennon et al., 2018; Pearson et al., 2020), and two mixed-methods studies (Ross et al., 2012; Jones et al., 2010). These studies were carried out in the United Kingdom (n = 3), New Zealand (n = 2), Ireland (n = 1), Poland (n = 1), Saudi Arabia (n = 1), and Australia (n = 1).

All of these nine studies assessed the recognition of financial incentives in relation to the responsibilities of a nurse prescriber (Jones et al., 2010; Cousins et al., 2012; Ross et al., 2012; Lennon et al., 2018; Currie et al., 2018; Pearson et al., 2020; Zimmermann et al., 2020; Fox et al., 2022; Almotairy et al., 2023).

Almotairy et al. (2023) conducted a quantitative study to assess nurses' readiness to prescribe medications under supervision in various settings. A total of 379 nurses completed an online cross-sectional survey. The results indicated that a total of 163 participants (43%) agreed with the significance of compensation, while 89 participants (23.5%) strongly agreed with the need for specific compensation. Nevertheless, 33 participants (8.7%) expressed disagreement, and 9 participants (2.4%) strongly disagreed with the importance of specific compensation. The chi-square analysis revealed significant differences in responses regarding the significance of compensation for nurse prescription responsibilities ($p < 0.001$).

Fox et al. (2022) conducted a cross-sectional study to examine the preparedness of registered nurses in Australia to prescribe medication under supervision. A total of 4,424 registered nurses from various healthcare settings participated in the study. The

results indicated that 1,404 of participants (32.2%) expressed agreement with the importance of remuneration, while a further 2,213 participants (50.7%) strongly agreed with this need. Just 60 participants (1.4%) disagreed, though 103 participants (2.4%) also strongly disagreed. Similar to Almotairy et al. (2023), the chi-square analysis revealed major variations in answers regarding the significance of pay for nurse prescribing responsibilities ($p < 0.001$).

The percentage of nurses who indicated agreement in Almotairy et al. (2023) was higher than for the same group in Fox et al. (2022). On the other hand, the percentage of nurses who expressed strong agreement in Fox et al. (2022) was greater than the percentage of nurses who indicated strong agreement in Almotairy et al. (2023). Other factors, such as the specific contexts and healthcare systems in each country, may have impacted this slight difference between Almotairy et al.'s (2023) and Fox et al.'s (2022) studies.

A national cross-sectional study conducted by Zimmermann et al. (2020) aimed to investigate the current situation of nurse prescribing in Poland. A total of 819 nurses and midwives preparing to become independent prescribers participated. A total of 584 participants (70.9%) indicated that they need to have financial incentives for their new roles, though 219 of participants (26.7%) agreed that higher pay is an essential factor motivating nurses to become prescribers. The results showed that nurses recognise the importance of financial incentives in promoting their fulfilment of the prescribing responsibility. It is crucial to acknowledge that these results are derived from nurses who are preparing to assume prescribing responsibilities, which implies that their actual experiences with financial compensation have not been captured.

These results are most representative of the early stages of implementing the nurse prescribing role.

In New Zealand, Currie et al. (2018) conducted a quantitative study to investigate factors that facilitate and hinder nurse prescribing role. A total of 36 nurse prescribers in general practice participated in the cross-sectional survey. A total of 27 participants (27%) agreed that inadequate financial incentives was the main difficulty associated with their prescribing responsibilities. This study also highlighted the importance of financial incentives as motivators for encouraging registered nurses to pursue the role of prescriber. However, the study had several limitations, including a small sample size and a non-random sampling approach, which may limit the generalisation from the results (Asiamah et al., 2022).

Pearson et al. (2020) conducted a qualitative study in New Zealand to explore nurse prescribers' perceptions of both obstacles and enablers to their prescribing practice. A total of 16 semi-structured interviews were conducted with registered nurse prescribers. This study included nurse prescribers with varying levels of experience; eight had less than one year of experience, while eight had more than one year of experience in prescribing. The nurse prescribers who participated expressed concerns about a lack of financial rewards despite undertaking a responsible role in prescribing medications.

Cousins et al. (2012) and Lennon et al. (2018) reported similar findings in their qualitative studies. Lennon et al. (2018) carried out a qualitative study that took place in Ireland and explored the experiences of nurse prescribers. The study conducted 11 semi-structured interviews with nurse prescribers in secondary care. Two participants had been prescribing for a year, while nine had more than two years of prescribing

experience. Nurse prescribers expressed concerns about the ongoing lack of promotions, despite their assumption of accountability for prescribing practice. Cousins et al.'s (2012) qualitative study explored both facilitatory and barrier factors to nurses' prescribing practice. The study conducted six semi-structured interviews with nurse prescribers in general practice. All participants were independent nurse prescribers who had been prescribing roles for a minimum of three years. The study revealed that nurses who received approval as independent prescribers did not receive additional financial incentives. This lack of recognition provoked dissatisfaction among participants.

Interestingly, the studies conducted by Cousins et al. (2012), Lennon et al. (2018), and Pearson et al. (2020) included nurse prescribers who had been given prescribing responsibilities for less than one to three years across various countries. This suggests that the lack of financial recognition of the role of the nurse prescriber is not an isolated incident but rather a pervasive and long-standing problem in healthcare systems globally.

A mixed-methods study conducted in the United Kingdom by Ross et al. (2012) aimed to investigate the perspectives of mental health nurse prescribers regarding obstacles to independently prescribing medications. This study utilised surveys completed by thirty-three individuals, followed by interviews with twelve nurse prescribers in focus groups to gather data. Quantitative data revealed that one of the most significant obstacles was that none of the 33 participants (100%) had received a financial reward. Also, in qualitative data, the study identified a lack of recognition as a major obstacle to nurses becoming prescribers; the participants claimed that their increased responsibilities did not result in financial rewards. Evidence from both

qualitative and quantitative data constantly proves the claims of absence of recognition.

Similarly, Jones et al. (2010) investigated the experience of mental health nurse prescribers with their prescribing role in a mixed-methods study. The data was collected by using a repeated measures approach that examined participants 10 weeks before and on day one of a training programme using a multiple-choice questionnaire. In addition, two focus groups were conducted with mental health nurse prescribers (n = 13). In the focus group, the mental health nurse prescribers claimed that the NHS failed to financially recognise their new responsibilities in the prescribing role, which they perceived as a challenge to their prescribing role.

Both the mixed-method studies by Ross et al. (2012) and Jones et al. (2010) consistently support claims of inadequate compensation and lack of recognition. The convergence of the findings from both studies strengthens the overall findings' credibility and reliability.

It is clear that financial incentives are recognised as a critical facilitator for implementing the nurse prescribing role among registered nurses. However, studies conducted in various countries have demonstrated that nurse prescribers often experience a lack of financial incentives, despite taking on prescribing responsibilities, which is seen as an obstacle.

2.4.4.6 Summary

Several organisational factors that both facilitate and impede the effective implementation of the nurse prescribing role were identified. The findings highlight the importance of support to facilitate the integration of this role, particularly in the

realms of administrative support, clinical supervision support, and peer support at the organisational level. Administrative support is necessary, especially for the acknowledgement of the nurse prescribing role. Without such acknowledgement, nurses may face significant barriers that hinder their ability to fulfill their prescribing responsibilities. Moreover, clinical supervision by medical professionals is a vital aspect to support nurse prescribers, as highlighted by Stenner et al. (2008) and Carey et al. (2010). Effective clinical supervision depends on positive interprofessional relationships among doctors and nurses, which are vital to providing necessary guidance and oversight (Bowskill et al., 2013; Pearson et al., 2020).

The results showed that nurse prescribers have access to CPD; however, the level of accessibility varies among various quantitative studies. Additionally, quantitative studies revealed no correlation between the need to access CPD and variables such as job title, grade, and area of practice (Carey et al., 2010b). No study has investigated whether there are variations in the need for CPD between independent and supplementary nurse prescribers.

Various studies revealed barriers to electronic systems (patient records and generated electronic prescriptions) and prescription pads. These obstacles evidently impede the effective implementation of nurse prescribing practices. Studies investigating the attitudes of non-nurse prescribers (registered nurses) have highlighted that an unrestricted scope of prescribing can act as a facilitator for nurse prescribing (Fox et al., 2022; Almotairy et al., 2023). However, studies that specifically focus on nurse prescribers present varied perspectives. Some studies indicated that certain restrictions on prescribing practices are viewed favourably, as they are perceived to enhance patient safety and ensure responsible prescribing (Bowskill et al., 2012;

Maddox et al., 2016; Lim et al., 2017). Conversely, other studies reveal a more critical stance, with nurse prescribers conveying dissatisfaction over these restrictions, as they limit their ability to prescribe medications and necessitate reliance on physicians and patient group directions to prescribe medications.

Quantitative studies carried out in countries that have not yet implemented the nurse prescribing role have shown that financial incentives play a crucial role in facilitating its implementation (Fox et al., 2022; Almotairy et al., 2023). However, studies in countries that have implemented nurse prescribing consistently report a lack of financial incentives for both new nurse prescribers and nurse prescribers who have been practicing prescribing for many years in the prescribing role.

2.4.5 Factors related to nurse prescribing role acceptance

This theme investigates several factors that may either hinder or facilitate the acceptability of the nurse prescribing role. This theme has three subthemes: 1) nurses' confidence in their prescribing responsibilities; 2) interprofessional acceptance of the nurse prescribing role; and 3) patient acceptance.

2.4.5.1 Nurses' confidence in their prescribing responsibilities

Nine studies investigated nurses' confidence levels in prescribing responsibilities and the factors that influence their confidence in prescribing responsibilities. Five studies were quantitative (Courtenay et al., 2007; Carey et al., 2007; Courtenay et al., 2008b; Cashin et al., 2014; Casey et al., 2020); two studies were qualitative (Darvishpour et al., 2016; Jodaki et al., 2024); and two were mixed methods studies (Coull et al., 2013; Seck et al., 2023). These studies were conducted in various countries, including the UK (n = 4), Iran (n = 2), Ireland (n = 1), Australia (n = 1), and Spain (n = 1).

One study investigated supplementary nurse prescribers' confidence in their prescribing practice (Carey et al., 2007). Another study investigated nurse prescribers' confidence in accepting independent prescribing responsibilities (Courtenay et al., 2008b). Two studies investigated both independent and supplementary nurse prescribers' confidence in prescribing responsibilities (Courtenay et al., 2007; Coull et al., 2013). Two studies investigated nurse prescribers' confidence in altering medication plans for their patients (Cashin et al., 2014; Casey et al., 2020). Three studies examined the importance of confidence in the initial stage of implementing the prescribing role (Darvishpour et al., 2016; Seck et al., 2023; Jodaki et al., 2024).

A national survey study carried out by Carey et al. (2007) explored the factors that may facilitate or hinder the implementation of the nurse prescribing role among supplementary nurse prescribers. A total of 580 supplementary nurse prescribers working with patients with dermatological conditions in both primary and secondary care participated. A total of 436 participants (75%) had a degree level qualification or higher, 41 (7%) had specialist dermatology training, and 512 (88.3%) had more than ten years of post-registration nursing experience. Remarkable results emerged, with all 580 supplementary nurse prescribers (100%) describing feelings of confidence regarding their competence to prescribe medications. This suggests that supplementary nurse prescribers may feel more confident as a result of prescribing in partnership with other independent prescribers. However, this study used a convenience sampling strategy. This sample may not be completely representative of the entire population (Andrade, 2021).

Another quantitative study undertaken by Courtenay et al. (2007) aimed to identify the factors that either facilitated or inhibited nurse prescribing practice among

independent extended/supplementary nurse prescribers. This study included 868 independent qualified extended/supplementary nurse prescribers across the United Kingdom. A total of 757 participants (87%) reported that since qualifying to prescribe medications, they had filled the role of an extended nurse prescriber (independent prescribing). A total of 304 participants (35%) had utilised supplementary prescribing. The majority of participants, 776 (89%), reported feeling confident in their prescribing practice. This study also revealed that 58 participants (9.4%) in general practice, 38 participants (11.8%) in specialist nursing, 13 participants (11.5%) in senior nursing, and nine participants (13.8%) in the community nursing group reported lack of confidence as a barrier to the prescribing role. In general, only 117 participants (10.6%) reported a lack of confidence. Although participants acknowledged lack of confidence as an obstacle, it was reported to be less frequent among them. This suggests that it is not a highly prevalent barrier among nurse prescribers. However, the study did not separate the level of confidence between nurses who prescribe independently and those who prescribe medications supplementarily. This study also used a convenience sampling strategy (non-random sampling strategy), which may limit the generalisability of this study's results to larger groups of independent and supplementary nurse prescribers (Andrade, 2021).

Courtenay et al. (2008b) conducted a quantitative study aimed to provide an overview of nurse independent prescribing and nurse supplementary prescribing across the United Kingdom. The study included 1377 registered nurses who were either independent prescribers (NIPs) or supplementary prescribers (NSPs). The majority of 1197 participants (87%) utilised independent nurse prescribing, while a total of 607 participants (44.6%) utilised supplementary nurse prescribing. A total of 427 participants (31.0%) used both independent and supplementary nurse prescribing. The

majority of participants worked in general practice in primary care. Approximately 590 prescribers (42.7%) had been authorised for over 2 years. The study examined participants' confidence levels in adopting independent prescribers (IP). Out of the 1,377 participants, only 690 nurse prescribers (53.0%) indicated that they would feel confident in undertaking independent nurse prescribing. This result suggests that a significant percentage of participants had reservations or uncertainty about taking on the full responsibilities associated with the IP role. The strength of this study is the use of a random sampling approach, which improves the representativeness of the sample and enables generalisation of results (Rahman et al., 2022).

However, none of the two quantitative studies carried out by Courtenay et al. (2007) and Courtenay et al. (2008b) investigated the correlation between level of experience in the prescribing role and level of confidence among nurse prescribers prescribing medications independently. This creates a lack of knowledge regarding the effect of prescribing experience on the confidence levels of nurse prescribers engaged in independent prescribing.

In Ireland, Casey et al. (2020) conducted a national survey that explored nurse prescribing practice enablers and hinderers to implementing nurse prescribing roles. The study included 84 nurse and midwife prescribers who participated. The survey respondents indicated a high level of confidence in their ability to comply with the legal requirements for prescribing, with 67 participants (79.8%) expressing strong confidence, 16 (19.1) expressing a mild level of confidence, and only one participant (1.2) having no confidence at all in their prescribing abilities. A high level of confidence was expressed by 38 participants (45.1%) in terms of the adjustment of medications prescribed by other healthcare professionals, while 27 participants

(31.7%) expressed a moderate level of confidence, and just 7 participants (8.5%) expressed no confidence at all. Furthermore, 61 participants (73.5%) demonstrated a high level of confidence, 19 participants (22.9%) conveyed a moderate level of confidence, and only 3 participants (3.6%) showed little confidence in their ability to monitor patients' responses to medications. Participants' confidence levels regarding the discontinuation of medications prescribed by other providers varied significantly. 36 participants (42.9%) indicated a high level of confidence, 28 participants (33.3%) showed a moderate level of confidence, and 14 participants (16.7%) conveyed a low level of confidence. The participants showed similar levels of confidence in their ability to identify potential medication interactions, with 32 participants (38.1%) showing a high level of confidence and 42 participants (50.0%) demonstrating a moderate level of confidence, with just 10 participants (11.9%) conveying a low level of confidence. However, the study had a low response rate of just 8.4%, raising concerns about the representativeness of the sample (Wu et al., 2022).

In Australia, Cashin et al. (2014) carried out a quantitative study, using factors comparable to those in Casey et al. (2020) to evaluate the level of confidence among nurse practitioners. The survey included 209 authorised nurse practitioners who were members of the Australian College of Nurse Practitioners (ACNP). This study found that a total of 140 participants (67.5%) reported feeling confident in terms of meeting their legal obligations regarding prescription medications. Among all participants, 162 (77.5%) reported feeling confident in integrating new medications into their clients' treatment plans, and 187 participants (89.5%) showed confidence in educating clients about medications; 177 participants (84.2%) also felt confident in monitoring their clients' medication reactions. However, only 125 participants (60%) reported a strong sense of confidence regarding modifying prescriptions given by other healthcare

professionals, while only 105 participants (50.2%) reported feeling highly confident with regard to discontinuing medications provided by others.

Interestingly, Casey et al. (2020) did not directly investigate the correlation between participants' years of experience in prescribing and their self-reported levels of confidence, though Cashin et al. (2014) did. Cashin et al. (2014) found a positive association between nurse practitioners' experience and their confidence in multiple aspects of medication management and prescribing. There was a moderate positive correlation ($r = 0.244$, $p = 0.001$) regarding complying with legal prescribing requirements, which suggests that the confidence of nurse practitioners regarding satisfying prescribing legal requirements increases by approximately 24.4% as they gain each year of experience. A moderate positive correlation ($r = 0.214$, $p = 0.005$) was also observed regarding new medication being incorporated confidently into a client's treatment. These results indicate that the confidence in the inclusion of new medications increases by approximately 21.4% for each additional year of nurse practitioners experience. An even stronger positive correlation was found for the adjustment of medications prescribed by other healthcare professionals ($r = 0.296$, $p < 0.001$): with each additional year of nurse practitioners experience, the confidence of nurse practitioners regarding adjusting the prescriptions of others increases by nearly 30%. The positive correlation weakened for the discontinuing of medications prescribed by other providers, yet it remained statistically significant ($r = 0.167$, $p = 0.028$): thus, as nurse practitioners experience increases by an additional year, their confidence in discontinuing the prescriptions of others increases by approximately 16.7%.

These results suggest that confidence in a variety of prescribing related responsibilities, including legal compliance, the incorporation of new medications, the adjustment of prescriptions, and the discontinuation of medications, tends to increase as nurse practitioners build up more years of experience. This highlights the significance of experience in the development of prescribing competence. Although this study had a high response rate of 83%, however, the sample only included ACNP members in Australia, which may restrict its representativeness across a broader range of nurse practitioners.

A mixed-methods study by Coull et al. (2013) evaluated nurse prescribing in Scotland from 2001 to 2006. They collected data through in-depth interviews and a national survey covering nurse prescribers, nurses, patients, doctors, and regulatory bodies. In qualitative data, nurse prescribers were generally perceived to be confident in their prescribing areas because of their familiarity with medications prescribed in their areas of prescribing practice. The findings imply that prescribing within areas of expertise is linked with a high level of confidence. Nurses feel more assured when prescribing within their specialised fields, as they are familiar with both medications and patient needs. This expertise boosts their confidence in making accurate decisions.

A mixed-methods study carried out by Seck et al. (2023) to identify and reach consensus on the obstacles and facilitators of nurse prescribing practice in Spain. This study collected data through three iterations of an online Delphi survey and one focus group. The focus group discussion revealed that nurses acknowledge the significance of cultivating a heightened feeling of confidence, particularly during the first stages of their prescribing practice. Nurse prescribers' confidence facilitates the seamless

integration of nurse prescribing into healthcare practice, enabling them to confidently demonstrate their expertise and successfully navigate obstacles. This highlights the importance of nurses cultivating a greater sense of confidence, particularly in the early stages of their careers, in order to maximise their effectiveness in the prescribing role.

A qualitative study conducted by Jodaki et al. (2024) to explore obstacles to implementing nurse prescribing roles in Iran. A total of 13 semi-structured interviews were carried out with registered nurses working in secondary care settings. Jodaki et al. (2024) found that the lack of self-confidence among nurses to prescribe medications significantly hindered the implementation of nurse prescribing practice. They perceived inadequate education regarding medication prescribing during their nursing education as the primary cause of this lack of confidence.

In Iran, Darvishpour et al. (2016) conducted a qualitative study that reported similar findings. Darvishpour et al.'s (2016) study aimed to explore factors that either facilitate or impede the introduction of the nurse prescribing role. A total of 14 semi-structured interviews were conducted with policymakers. This study found that policymakers perceived human factors, particularly lack of confidence, as causing a significant barrier to initiating nurse prescribing practice. This study highlighted that nurses need to improve their confidence level by undertaking appropriate prescribing training, as undergraduate education does not adequately prepare them to make medication prescribing decisions. In addition, participants claimed that nurses' confidence in prescribing would increase as they became more actively involved in clinical prescribing practice.

The two studies by Jodaki et al. (2024) and Darvishpour et al. (2016) were conducted in Iran, a country that has not yet implemented nurse prescribing practice. Their findings suggest an association between a lack of confidence in initiating prescribing and a limited emphasis on such responsibilities during undergraduate education, which leads to a lack of prescribing knowledge and skills.

It is evident from quantitative studies that nurse prescribers generally have a high level of confidence in their prescribing roles. Nevertheless, variations exist in the level of confidence among nurse prescribers due to the prescribing approach (independent or supplementary) and specific responsibilities (such as changing or adjusting medication dosages). However, experiences significantly contribute to enhancing a nurse's confidence in their prescribing role. Qualitative studies conducted in a country that has not yet implemented the role highlighted a lack of confidence among registered nurses in initiating prescribing practice, often due to inadequate education and training.

2.4.5.2 Interprofessional acceptancy for the nurse prescribing role

Twelve studies investigated the acceptability of a nurse's prescribing role among healthcare providers, along with the factors that might facilitate or impede this acceptance. Four were quantitative studies (Courtenay et al., 2007; Courtenay et al., 2008; Snell et al., 2022; Naderi et al., 2021), and seven studies were qualitative (Stenner et al., 2008; Stenner et al., 2010; Darvishpour et al., 2016; Lim et al., 2017; Hopia et al., 2017; Lennon et al., 2018; Jodaki et al., 2024); one mixed method study (Seck et al., 2023). These studies were conducted in different countries, including the United Kingdom (n = 4), New Zealand (n = 1), and in both the United Kingdom and New Zealand (n = 1), Iran (n = 3), Ireland (n = 1), Finland (n = 1), and Spain (n = 1).

Four studies explored perspectives on the potential for medical professionals to accept the nurse prescribing role (Naderi et al., 2021; Darvishpour et al., 2016; Seck et al., 2023; Jodaki et al., 2024). Eight studies have investigated nurse prescribers' experiences with medical and other healthcare professionals' acceptance of their prescribing role (Courtenay et al., 2007; Courtenay et al., 2008; Stenner et al., 2008; Stenner et al., 2010; Lim et al., 2017; Hopia et al., 2017; Lennon et al., 2018; Snell et al., 2022).

Courtenay et al. (2008b) conducted a quantitative study to identify the barriers independent nurses and supplementary nurse prescribers faced in implementing their prescribing practices in the United Kingdom. A total of 1,400 (70%) questionnaires were returned, with 1,377 completed. This study showed that supplementary nurse prescribers experienced some opposition, with 88 out of 649 supplementary nurse prescribers (13.6%) reporting a lack of acceptance. Independent nurse prescribers also reported objections, with 153 out of 938 independent nurse prescribers (16.3%) agreeing that they had experienced a lack of acceptance regarding their roles. Courtenay et al.'s (2007) earlier quantitative research aimed also to identify factors that either helped or hindered nurse prescribers, using a national survey completed by 868 qualified independent extended/supplementary nurse prescribers. Courtenay et al.'s (2007) study reports significantly lower percentages of lack of acceptability in comparison to the previous study conducted by Courtenay et al. (2008b). A total of 21 out of 868 independent extended/supplementary nurse prescribers (2%) reported experiencing objections to their prescribing role from medical staff. This may be attributed to the fact that Courtenay et al.'s (2008b) study, which utilised a larger randomly selected sample, demonstrated a wider variety of experiences regarding medical professionals' acceptability levels compared to Courtenay et al.'s (2007)

study, which relied on a convenience sampling strategy. However, the results of both studies conducted by Courtenay et al. (2007, 2008b) suggest that few nurse prescribers have experienced objections from medical professionals. This suggests that medical professionals are likely to accept nurses' prescribing responsibilities.

Snell et al. (2022) conducted a quantitative study that compared barriers and facilitators among nurse prescribers in diabetic services in New Zealand and the United Kingdom. A total of 250 nurses and prescribers participated in the survey. This study showed that in the United Kingdom and New Zealand, 13 nurse prescribers (12.1%) and 9 nurse prescribers (9.6%) agreed that objections from medical colleagues hindered their prescribing role, respectively. This study also revealed that a small percentage of nurse prescribers experienced objections from medical professionals, indicating a limited resistance from medical professionals to the nurse prescribing role in both countries.

Naderi et al. (2021) conducted a cross-sectional study to investigate the barriers to implementing nurse prescribing roles in Iran. A total of 136 nurses working in intensive care units (ICU) participated. In contrast to Snell et al. (2022), a large percentage of nurses reported on potential barriers related to nurse prescribing acceptancy among medical professionals. A total of 110 out of 136 participants (96.5%) agreed that resistance from physicians acted as a hindrance to implementing nurse prescribing responsibilities. However, Naderi et al.'s (2021) study results may have overstated this resistance from medical professionals due to the nursing participants' lack of direct experience with prescribing practice.

Both Naderi et al. (2021) and Snell et al. (2022) agreed that opposition from medical colleagues is an obstacle to the nurse prescribing role. Nevertheless, their notable

difference in the reported percentages suggests that contextual factors and experience have an impact on participants' attitudes.

A qualitative study undertaken by Lennon et al. (2018) explored the experiences of nurse prescribers in an acute service setting in New Zealand. A total of 11 semi-structured interviews were conducted with nurse prescribers. This study revealed that nurses frequently experience a lack of understanding regarding their prescribing responsibilities among medical professionals during the initial phases of integrating their new roles in prescribing. This study highlighted the necessity of clarifying the boundaries of nurse prescribing authority in order to mitigate scepticism and improve acceptance of their responsibilities among medical professionals.

These findings resonate with qualitative studies conducted by Lim et al. (2017) and Stenner et al. (2008). Lim et al. (2017) explored the experiences of nurse prescribers in New Zealand. A total of ten semi-structured individual interviews were carried out with nurse prescribers who prescribed medications in both primary and secondary healthcare settings. Participants revealed that they experienced scepticism regarding their prescribing authority, particularly from medical professionals who did not work on the same teams. The nurse prescribers revealed that proactive communication with medical professionals regarding their prescribing responsibilities was effective in counteracting mistrust and enhancing their acceptance of their new roles. They also provided tangible instances of their competencies to demonstrate their skills and abilities in prescribing, which further enhanced their role acceptance among medical professionals.

Stenner et al. (2008) conducted a qualitative study to explore the perspectives of nurse prescribers about the role of interprofessional relationships and support for the role of

nurse prescribing in acute and chronic pain. The study conducted a total of 26 semi-structured interviews with nurse prescribers. They also found that poor understanding of the role by other healthcare professionals can act as a barrier. However, the participants revealed that proactive communication with colleagues about the nurse prescribing role, including explicit details about their prescribing boundaries, helped overcome this difficulty. This approach was effective in mitigating opposition from other professional groups.

The consistent findings reported from multiple studies conducted by Lennon et al. (2018), Lim et al. (2017), and Stenner et al. (2008) provide strong evidence that a clear explanation of nurse prescribing boundaries helps medical and other healthcare professionals understand the nurse's prescribing responsibilities. This clarity then reduces concerns that nurses may overstep their boundaries within the traditional prescribing domain of medical professionals, which enhances acceptance of the nurse prescribing role.

Qualitative studies carried out by Stenner et al. (2010) and Hopia et al. (2017) reported contrasting findings. Hopia et al. (2017) conducted a descriptive qualitative study to explore the facilitators and barriers associated with the development of nurse prescribing competence in Finland. The study collected data from online learning diaries of nurses enrolled in a prescribing programme. The findings of this study indicated that medical professionals were positively accepting of their prescribing practices, which was a facilitating factor in their role. The participants believed that medical professionals' acceptance of the role contributed to improving their confidence, competency, and experience during their training. However, this study's data collection method (online learning diaries) did not provide detailed evidence on

the specific factors that contributed to enhance acceptability among medical professionals. It is crucial to emphasise that the participants in this study were students in a prescribing programme who had not yet begun to integrate the prescribing role into their practice. This may limit the extent of their knowledge regarding the acceptability of their prescribing practice during implementation in actual practice. This makes it important to exercise caution when interpreting these findings.

Stenner et al. (2010) carried out a qualitative study to explore different perspectives on the implementation of nurse prescribing in diabetes services. They conducted a total of 31 semi-structured interviews with qualified nurse prescribers, administrative personnel, physicians, and non-nurse prescribers. They found that the nurse prescribing role was generally accepted by the medical professionals. They also revealed that three factors were vital to enhancing the acceptance of their role: they needed to have the necessary knowledge and experience, prescribe medications within their identified areas of competence, and be aware of their limitations. In general, they found that their role in prescribing was more accepted among medical professionals because they had an established role and a good level of experience in diabetes services.

Stenner et al.'s (2010) study included nurse prescribers who had begun their prescribing role in practice. This inclusion facilitated an exploration of the factors that influence the acceptability of nurse prescribing, including the nurse's level of experience, knowledge, and understanding their prescribing boundaries, all of which contribute to enhancing the role's acceptability among medical professionals. In contrast to Hopia et al.'s (2017) study, the lack of practical implementation of the role

among student nurses in prescribing programms may limit the transferability of their findings.

Jodaki et al. (2024) conducted a qualitative study to explore the obstacles to the implementation of nurse prescribing roles in Iran. The study involved conducting 13 semi-structured interviews with registered nurses in secondary care. The study's findings suggest that the potential lack of acceptance of nurse prescribing practice among medical professionals may stem from a lack of trust and effective communication between nurses and doctors. This study highlighted the importance of improving interprofessional interactions and communication to promote trust between nurses and medical professionals, which is a critical step toward accepting nurse prescribing roles within healthcare systems. These findings indicate that the acceptance of nurse prescribing roles depends on addressing obstacles related to communication and trust among nurses and medical professionals. This necessitates a focus on strengthening interprofessional interactions in healthcare settings.

A qualitative study carried out by Darvishpour et al. (2016) to identify the barriers and facilitators that might affect the introduction of the nurse prescribing role in Iran. A total of 14 semi-structured interviews were conducted with policymakers. This study revealed that the dominant culture within the healthcare system primarily prioritises doctors above other healthcare professionals. This physician-centric attitude has contributed to a feeling of superiority among medical professionals. This can be a significant barrier to the acceptability of the nurse prescribing role.

A recent mixed methods study in Spain by Seck et al. (2023) reported similar findings to those reported in Darvishpour et al.'s (2016) study. Seck et al. (2023) intended to achieve consensus on the factors that enable and hinder nurse prescribing practice.

This study gathered data from nurses using a focus group and a three-phase online Delphi survey. Participants from the focus group emphasised that physicians hold higher positions within the healthcare hierarchy, resulting in a notable power disparity. A significant barrier to the acceptance of nurse prescribing exists due to the prevailing culture that prioritises physicians and views them as almost omnipotent beings. The participants also emphasised the need to reduce the current reliance of nurses on doctors, arguing for more independence in nursing practice. This study also highlighted the need to address the long-standing patterns of behaviour and organisational structures that reinforce such dependance, especially in hospital and rural environments. These findings from studies by Darvishpour et al. (2016) and Seck et al. (2023) suggest that significant cultural and structural changes are necessary, especially in the early stages of nurse prescribing responsibilities implementation, to promote nurse prescribing adoption and strengthen nursing professional autonomy.

In quantitative studies, it is evident that although certain nurse prescribers encountered objections from their medical colleagues, the overall percentage of such objections was relatively low. The findings of qualitative studies revealed that enhancing the acceptability of the role requires the establishment of effective communication and clarification of nurse prescribers' responsibilities in prescribing. However, cultural factors within the healthcare system, such as the dominance of medical professionals, may significantly impede the acceptance of nurse prescribing roles in countries that have either not implemented or have recently implemented nurse prescribing practices.

2.4.5.3 Patient acceptancy

Nine studies investigated the acceptability of nurse prescribing roles among patients, along with the factors that might facilitate or impede the patients' acceptance. There were two quantitative studies (Fox et al., 2022; Almotairy et al., 2023), six qualitative studies (Stenner et al., 2010; Darvishpour et al., 2016; Lim et al., 2017; Lennon et al., 2018; Canet-Vélez et al., 2023; Jodaki et al., 2024), and one mixed-methods study (Seck et al., 2023). These studies were conducted in various countries, including Iran (n = 2), Spain (n = 2), Ireland (n = 1), New Zealand (n = 1), Australia (n = 1), Saudi Arabia (n = 1), and the UK (n = 1).

Five studies investigated the experiences of nurse prescribers in relation to the acceptability of their prescribing role among patients (Stenner et al., 2010; Lim et al., 2017; Lennon et al., 2018; Canet-Vélez et al., 2023; Seck et al., 2023). Four studies explored the potential acceptability of nurses prescribing roles among patients (Darvishpour et al., 2016; Fox et al., 2022; Almotairy et al., 2023; Jodaki et al., 2024).

Almotairy et al. (2023) conducted a cross-sectional study in Saudi Arabia to investigate registered nurses' readiness to prescribe medication under supervision. A total of 379 nurses from both healthcare and non-healthcare settings participated. The study found that patient or client acceptance of nurse prescribing was a facilitative factor enabling the adoption of nurse prescribing in Saudi Arabia; a total of 140 participants (36.9%) agreed and 82 participants (21.6%) strongly agreed that patient or client acceptance of nurse prescribing would facilitate the implementation of nurse prescribing roles. However, 48 participants (12.7%) disagreed, while a total of 17 participants (4.5%) strongly disagreed. A chi-square test carried out on these responses resulted in a p-value of less than 0.001. This indicates substantial statistical

consensus among participants about the acceptability of nurse prescribing as an important facilitator, indicating that many participants perceive this as highly important.

In a recent quantitative study in Australia carried out by Fox et al. (2022). Fox et al. (2022) similarly investigated registered nurses' readiness to prescribe medication under supervision. A cross-sectional survey was used to collect data from 4,424 registered nurses from a variety of healthcare settings. Fox et al.'s (2022) study found that a larger proportion, 2,171 participants (49.9%), strongly agreed that patient/client acceptance was a facilitator, compared to the lower proportion of 82 participants (21.6%) found in Almotairy et al.'s (2023) study. Additionally, 1,607 participants (36.9%) agreed with this notion, while just 74 (1.7%) disagreed, and 52 (1.2%) strongly disagreed. The prevailing perspective indicates that most nurses hold a view that patient acceptance could greatly facilitate the adoption of nurse prescribing. The mean score for the acceptability of the nurse prescribing role by patients and clients was 332, with a standard deviation of 0.82. This implies that participants recognise that acceptance by patients is an important factor in facilitating the implementation of the nurse prescribing role.

Both Almotairy et al. (2023) study and Fox et al. (2022) agreed that patient/client acceptability is a vital factor for implementing nurse prescribing roles. However, these studies did not delve into the specific reasons or factors contributing to patients' acceptance of the nurse prescribing role.

Jodaki et al. (2024) conducted a qualitative study to explore obstacles to implementing nurse prescribing roles in Iran. Thirteen semi-structured interviews were carried out with registered nurses in secondary care. They found that patients

would not accept nurse prescribing practices and would choose to see medical professionals and take prescriptions instead. These nurse participants conveyed concern that patients might reject the nurse prescribing role due to a lack of confidence in nurses' knowledge and skills compared to medical professionals; they perceived this as a barrier to the implementation of the nurse prescribing roles. These findings aligned with the early findings of Darvishpour et al.'s (2016) study, which involved interviewing 14 Iranian policymakers to explore the obstacles and enablers to the implementation of nurse prescribing practice in Iran. The policymakers believed that patients would be less trusting and confident in nurse prescribing compared to medical professionals. The study also revealed that the community's unfavourable opinion posed a significant obstacle to the implementation of the nurse prescribing role. Both studies identified the perceived lack of patient acceptance of nurse prescribing as a major obstacle. The similarity of such findings across nurses and policymakers further highlights the strong evidence of this concern as a potential barrier to the implementation of the nurse prescribing role.

However, studies conducted in countries that have implemented nurse prescribing roles have reported contrasting findings. A qualitative study conducted in Ireland by Lennon et al. (2018) explored the experiences of nurse prescribers in secondary care. Eleven nurse prescribers were interviewed. They found that all participants believed that patients were generally satisfied with nurse prescribing practice and accepting of the services provided by nurse prescribers. Lennon et al.'s (2018) findings were consistent with an early qualitative study by Stenner et al. (2010) in the United Kingdom. Stenner et al. (2010) explored nurse prescribers' perspectives on the integration of their prescribing role in diabetes care. This study involved 31 semi-structured interviews with nurse prescribers, administrative staff, doctors, and non-

nurse prescribers. Participants found that patients were unconcerned about nurses taking responsibility for their prescriptions, as their main priority was receiving the necessary treatment. Nevertheless, nurses found that some patients had a limited level of awareness about nurse prescribing roles. In both studies, nurse prescribers found that patients were accepting of their prescribing responsibilities. The consensus among these studies shows the validity of the findings regarding patient acceptance of nurse prescribing roles.

In contrast to the findings reported by Stenner et al. (2010) and Lennon et al. (2018), Lim et al. (2017) reported different findings. Lim et al. (2017) carried out a qualitative study to delve into the experiences of nurse prescribers in New Zealand. A total of ten semi-structured individual interviews with primary and secondary care nurse practitioners. Lim et al. (2017) found that although patients were generally accepting of receiving prescriptions from nurses, they were less confident in nurses as compared to doctors who traditionally provide medication prescriptions. This suggests that patient acceptance may not accurately reflect their actual confidence in nurses' prescribing competency. However, the limited sample size of this study necessitates careful interpretation of the findings.

Canet-Vélez et al. (2023) conducted a qualitative study to explore the experiences of nurse prescribers during the initial stages of taking on nurse prescribing roles in Spain. Twenty-eight nurses were interviewed. The participants emphasised the significance of promoting the normalisation of nurse prescribing among the general population to boost acceptance. They also highlighted the need to increase the dissemination of information to illustrate the efficacy and advantages of the nurse prescribing roles through the media. This indicates that the nurse prescribing role

remains unfamiliar to the general public, which may serve as a barrier to wider acceptance. This suggests that proactive education initiatives are necessary to inform service users about the advantages and capabilities of the nurse prescribing role, especially in the early stages of implementing the NP role.

A recent mixed-methods study carried out by Seck et al. (2023) in Spain aimed to reach agreement on the factors that facilitate and hinder nurse prescribing practice. This study collected data from nurses through a focus group and a three-part online Delphi survey. In focus group data, the participants claimed that patients had positive attitudes and acknowledged the responsibilities of nurses in prescribing roles. However, they noted that these positive attitudes could vary depending on that specific area or service that the patient was using. The participants also emphasised the importance of raising public awareness about the legitimacy of the role of nurse prescribers to improve their acceptability in a variety of services and settings.

Canet-Vélez et al. (2023) and Seck et al. (2023) focused solely on the initial stages of nurse prescribing implementation without exploring the potential evolution of patient and public acceptance as the role becomes more established. Caution is thus needed in the interpretation of these findings.

In quantitative studies where the role has not yet been implemented, it is evident that patient acceptability is a critical factor in the successful implementation of nurse prescribing. Qualitative studies further emphasised that patients' distrust and negative perceptions could be underlying causes of a lack of patient acceptability. Qualitative studies conducted in countries where nurse prescribing roles have been implemented indicate that the nurse prescribing roles are generally deemed acceptable by patients.

However, raising public awareness about the benefits of the nurse prescribing role is vital, especially in the early stages of implementation.

2.4.5.4 Summary

The acceptance of nurse prescribing practice depends not only on nurses' confidence in their abilities to undertake prescribing responsibilities, but also on doctors' and patients' acceptance of their roles. The earliest quantitative studies undertaken by Courtenay et al. (2007) and Courtenay et al. (2008b) reveal different nurse prescribers were generally confident in their abilities to prescribe medications. Nevertheless, difficulties occur in certain domains, such as modifying or ceasing medications, as highlighted in the studies conducted by Cashin et al. (2014) and Casey et al. (2020). However, there is a lack of studies exploring the confidence level of registered nurses in undertaking prescribing responsibilities.

Lack of acceptability of nurse prescribing roles among medical professionals is relatively low, as found in limited studies. One study also revealed that certain factors, including having sufficient knowledge, working within specific areas of competence, and being aware of their limits, contribute to enhancing the acceptance of medical professionals (Stenner et al., 2010). However, there is a dearth of studies that primarily aim to explore the perspectives and experiences of nurse prescribers during the early stages of implementation, as well as the factors that influence acceptance among patients, doctors, and other professionals.

Studies that included non-nurse prescribers highlighted the importance of patient acceptance as an effective facilitator of the nurse prescribing role. However, a lack of patient trust and confidence in nursing competency in prescribing can be a barrier to

integrating nurse prescribing roles. Educational initiatives are necessary to increase public awareness, especially during the initial stages of the role implementation.

2.5 Summary of the overall review

This narrative review provides an international perspective on the barriers and facilitators of nurse prescribing roles in various countries. The review presents a diverse range of evidence on the actual and potential barriers and facilitators to nurse prescribing roles, encompassing both countries that have implemented nurse prescribing roles and those that have not yet implemented it. The key findings from studies conducted in countries that have not yet implemented nurse prescribing roles were the need to improve healthcare services through the implementation of the nurse prescribing role, and the need to establish the legality of this role to support its implementation. The review identified different factors that may facilitate or hinder the implementation of the nurse prescribing role, such as educational and organisational factors. The organisational factors include a variety of aspects, including support, continuing professional development (CPD), resources to facilitate prescribing (such as electronic systems and prescription pads), prescribing restrictions, and financial incentives. Furthermore, this review identified other factors associated with the nurse prescribing role acceptance, including nurses' confidence in their ability to prescribe as well as interprofessional and patient acceptability. Many studies across the world, using different research methodologies, consistently identify these factors, supporting the existence of multiple facilitators and barriers to integrating the nurse prescribing role.

The majority of studies took place in primary healthcare settings. This suggests that such clinical settings widely utilise the nurse prescribing role. This review, however,

revealed that the authority of nurse prescribing practice is differently defined among countries, with some permitting nurses to prescribe medications whereas other countries impose restrictions on this authority. The studies included the perspectives of nurses at the practice level, as well as those of other significant stakeholders, including policymakers at the national level and administrative teams at the organisational level. This suggests that the successful implementation of this role requires the involvement of diverse perspectives from all levels of the healthcare system, not just those of nurses at the practice level.

This review notes a scarcity of research undertaken in the context of Saudi Arabia: only one quantitative study was conducted to investigate the preparedness of nurses to prescribe under supervision; only nurses from a variety of clinical and non-clinical contexts (academic contexts) are included (Almotairy et al., 2023). No studies have been conducted in Saudi Arabia involving participants from different levels of the Saudi healthcare system (including nurses at the practice level and other relevant stakeholders, including policymakers at the national level and/or administrative teams at the organisational level), to explore the readiness of including prescribing roles in nursing practice, specifically in primary clinical settings. The lack of qualitative studies further limits the knowledge of perspectives in the Saudi Arabian context and emphasises the need to conduct a qualitative study in a specific clinical setting that includes participants from all levels (such as nurses and other stakeholders).

This narrative review findings informed the current study, which aimed to address and bridge the limitations described above, thus filling the gaps in the current Saudi literature. The methodology adopted to address these gaps in knowledge is thus thoroughly explained and defended in the subsequent chapter (Chapter Three).

Chapter 3: Methodology and Method

3.0 Introduction

This chapter provides a detailed overview of the philosophical standpoint and research methodology employed to meet the research objectives; it begins by providing an outline of the research aim, objectives, questions, and the philosophical standpoint. Furthermore, it offers an overview of exploratory descriptive qualitative research and elucidates the rationale behind selecting this approach as the methodology for this current study. The chapter presents a detailed explanation of institutional theory and its various approaches, along with a rationale for selecting and using institutional theory as the theoretical framework. Additionally, this chapter presents a detailed description of the data collection method, sampling strategies, inclusion and exclusion criteria, and participant recruitment approaches. Finally, it discusses the data analysis and management, as well as the study's trustworthiness, reflexivity, ethical considerations, and data storage.

3.1 Research Aims and Objectives

This study aims to explore the readiness for expanding nursing practice to include a prescribing role in Saudi Arabian primary healthcare centres.

Research objectives

- To explore perspectives at the macro (policymakers), meso (nursing supervisors and managers) and micro (nurses) levels regarding the introduction of the nurse prescribing role in primary healthcare centres in Saudi Arabia.
- To explore perspectives at the macro (policymakers), meso (nursing supervisors and managers) and micro (nurses) levels regarding barriers to, and facilitators of,

the introduction of the nurse prescribing role in primary healthcare centres in Saudi Arabia.

- To explore perspectives at the macro (policymakers), meso (nursing supervisors and managers) and micro (nurses) levels regarding the changes required to introduce the nurse prescribing role in primary healthcare centres in Saudi Arabia.

3.2 Research Questions

The research questions are:

- What are the perspectives at the macro level (policymakers), meso level (nursing supervisors and managers), and micro level (nurses) regarding the introduction of the role of nurse prescribers in primary healthcare centres in Saudi Arabia?
- What are the facilitators of, and barriers to, the nurse prescribing role in Saudi Arabian primary healthcare centres from the perspectives of the macro level (policymakers), meso level (nursing supervisors and managers), and micro level (nurses)?
- What potential changes are required to expand the role of the nurse to include prescribing in Saudi primary healthcare centres from the perspectives at the macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses)?

3.3 Research Design

3.3.1 Philosophical Position

Philosophical standpoints critically shape what is considered knowledge and how phenomena are investigated via methodological approaches (Bradshaw et al., 2017).

According to Weaver and Olson (2006), these philosophical perspectives allow researchers to refine and describe the forms of evidence required and the methods for gathering, evaluating, and applying this evidence. In order to understand the philosophical stance of a researcher, it is necessary to first understand their underlying philosophical assumptions (Bradshaw et al., 2017). Guba and Lincoln (1994) posit that these assumptions include both ontology and epistemology (theoretical perspectives).

Crotty (1998) ascertains that epistemology is concerned with providing a philosophical grounding for determining what kinds of knowledge are achievable and how to be certain that they are both adequate and legitimate. Ontology would sit alongside epistemology, informing the philosophical standpoint (theoretical perspectives) (Crotty, 1998). As Creswell et al. (2018) have stated, ontology relates to the nature of reality and its characteristics. According to Bradshaw et al. (2017), it is concerned with the nature of being, the components that constitute being, and our ability to comprehend existence.

According to Guba and Lincoln (1994), the choice of a research paradigm is dependent on the philosophical stance (ontological and epistemological standpoint) of the researcher. Different research paradigms, each with its own distinctive ontological and epistemological standpoints, influence the interpretive frameworks used in scientific inquiry (Pope, 2020). According to Kuhn (1970), a paradigm is a set of concepts, theories, methods, and criteria that establish what is considered a legitimate contribution to a certain area. There are many different paradigms, and each of them has its own unique philosophical stance (ontological and epistemological standpoint) (Pope, 2020).

The philosophical belief of ‘logical positivism’ forms the cornerstone of the positivist paradigm, which is commonly linked to quantitative inquiry and the natural sciences. The positivist paradigm maintains an objective ontological standing, claiming that reality exists independently of human experience and that there is a single, observable truth that can be revealed through scientific inquiry. Its epistemological perspective places a high value on empirical data-derived knowledge (Creswell, 2014). The positivist approach enables researchers to gain an understanding of a phenomenon via direct observation (Pope, 2020). It employs quantitative methods and statistical analysis to detect causal relationships and derive generalisations from the results (Creswell, 2014).

Conversely, the post-positivist paradigm has developed in response to the criticism of the positivist paradigm (Weaver et al., 2006). The philosophy of post-positivism acknowledges the inherent limitations of human cognition and scientific pursuit, as well as the complexity of entirely knowing or measuring reality (Weaver et al., 2006). Weaver et al. (2006) stated that this paradigm shift enhances understanding of how the observer’s theoretical frameworks and viewpoints influence scientific observations to some extent.

The empirical paradigm sees reality as observable and experiential, and it derives knowledge from empirical evidence rather than abstract concepts (Jackson, 2015). It emphasises the importance of acquiring knowledge through experimentation and observation. Its epistemological stance views knowledge as provisional and subject to revision in response to new evidence (Jackson, 2015). The empirical paradigm is valuable in social research because it enables the formulation and testing of hypotheses, the evaluation of different interventions, and the recognition of

correlations between variables (Jackson, 2015). Supporters of the empirical paradigm often use quantitative methods in their study, such as experiments and surveys (Jackson, 2015). Researchers seek to collect evidence that proves or disproves theories through study replication, enabling comparisons across different study settings or time periods (Weaver et al., 2006). Although it is not feasible to definitively establish an inalienable, absolute truth in the social sciences, it is possible to demonstrate a strong link between variables. The empirical paradigm nevertheless has several limitations, particularly in its capacity to be applied to phenomena that are difficult to measure (Gillis et al., 2002). Quantifying themes that arise from participant experiences is challenging, making the empirical paradigm less effective when examining more subjective phenomena. The empirical paradigm fails to fully recognise the vital role of human subjectivity, which causes variations in perceptions of the same event due to individuals' distinct life experiences (Jackson, 2015).

The ontological and epistemological assumptions of the naturalistic paradigm are distinct from those of other paradigms (positivist and postpositivist) (Bailey, 1997). The naturalistic paradigm adopts the ontological stance that reality is complex, multifaceted, and interdependent, making it difficult to simplify it to numerical values (Bailey, 1997). The naturalistic paradigm embraces the epistemological stance that the knower (the enquirer) and the known (the object of enquiry) interact to acquire knowledge (Tavakol et al., 2004). This interaction takes place on the premise that all events, occurrences, and circumstances are constrained by time and context (Jacobson et al., 2020). Researchers in the naturalistic area must be adaptable and versatile and employ a multiplicity of qualitative methodologies, including interviews, observations, fieldwork, ethnography, case studies, and content and document analysis (Jacobson et al., 2020). Although the data collected via these approaches can

be incorporated into mixed methods and analysed using numerical analysis, the most realistic type of naturalistic inquiry is comprised of intentional sampling and inductive data analysis to develop a grounded theory (Jacobson et al., 2020).

The constructivist paradigm suggests that individuals develop their own comprehension and knowledge of the world by experiencing phenomena and reflecting on them (Adom, 2016). This paradigm operates under the premise that individuals' subjectively constructed concepts play a crucial role in shaping reality and human behavior (Adom, 2016). A relativist ontology, which asserts that there are multiple realities, and a subjectivist epistemology, which asserts that the knower and the responder co-create understandings of the world, along with a naturalistic methodological approach, are the core underpinnings of the constructivist paradigm (Lee et al., 2012).

The interpretivist paradigm maintains that subjectivity is the source of both meanings and reality (Pope, 2020). In the interpretivism paradigm, reality is idiosyncratic and contextually situated to concur with the individual's experiences and understandings (Ryan, 2018). Interpretation is unequivocally correlated with an individual's situation and relationship with the world (Ryan, 2018). Subjectivist epistemology, which places a focus on the subjective interpretation of events by researchers, is what distinguishes this framework from others (Pope, 2020). The interpretivism paradigm fundamentally criticises the idea of an objective reality. Instead, interpretivism proposes that reality is comprised of a variety of meanings and ways of knowing, which are dependent upon the context (Levers, 2013). The interpretivist paradigm is characterised by subjective epistemology and relativist ontology, with knowledge being fundamentally interconnected to humans (Junjie et al., 2022). This paradigm prioritises

intersubjectivity, often referred to as mutual recognition, and it is used to understand the interaction between the researcher and the study participants. Individuals' perspectives undergo new developments within the framework of their everyday experiences while phenomena are being studied (Weaver et al., 2006). Researchers can gain a greater understanding of a phenomena by investigating it from the perspective of the individuals who directly experience it (Pope, 2020). Therefore, the interpretative paradigm emphasises the use of modern research methods, such as interviews, observation, and ongoing engagement with the participants (Gillis et al., 2002).

The researcher holds a subjective perspective (subjective epistemology), asserting that reality is shaped by the interpretations of individuals. Subjective epistemology recognises the significance of knowledge without questioning the legitimacy of a peripheral reality (Levers, 2013). The researcher's ontological position aligns with relativism, suggesting that reality is context-dependent and varies according to the specific socio-cultural context (Guba et al., 1994). According to relative ontology, reality is an amalgamation of subjective perceptions, and no autonomous reality exists (Levers, 2013).

Guba and Lincoln (1989) argue that ontology and epistemology are all fundamentally linked to the selection of a research paradigm. This study does not aim to explore the meaning of the participants' prescribing experiences (constructivist paradigm) or to closely observe them as they fulfil their prescribing responsibilities in their naturalistic setting (naturalistic paradigm), as PHCs in Saudi Arabia have not yet implemented the nurse prescribing role. This study employed the interpretive paradigm, rooted in the belief that understanding the intricate, subjective perceptions

of individuals provides more valuable insights than relying solely on external measurements (Gillis et al., 2002). The interpretive paradigm is characterised by subjective epistemology and relativist ontology, with knowledge being fundamentally interconnected to humans (Junjie et al., 2022). This is in accordance with the researcher's philosophical standpoint. Moreover, the inductive nature of the interpretive paradigm is particularly advantageous for investigating areas with limited prior research (Simmons, 1995). As Simmons (1995) explains, the interpretive paradigm supports the development of new theories and insights in under-researched fields, making it an appropriate choice for this study, which seeks to address the knowledge gap regarding the readiness to incorporate prescribing roles into nursing practice within Saudi primary healthcare centres (PHCs). It is an approach that prioritises the understanding of individual perceptions within specific contexts, which is essential to this study. Consequently, the interpretive paradigm was identified as the most suitable paradigm, aligning with the researcher's standpoint and the study's aims to generate meaningful insights and contribute to the advancement of knowledge in this emerging area related to nurse prescribing.

Ontological assumptions ground epistemological assumptions, which in turn have methodological implications for the choice of certain data types and data collection methods (Kamal, 2019). The ontological underpinning of a study imposes limitations on the epistemological stance of the research (Lincoln and Guba, 2013). The ontology and epistemology adopted by a researcher necessitate the use of a specific methodology (Kamal, 2019). In line with many realities, this study adopts a subjective epistemology and relative ontology, acknowledging that the cultural and social context of Saudi Arabia significantly influences the participants' perceptions of

reality. The qualitative research design was deemed the most appropriate research approach for addressing the research questions.

3.3.2 Justification for the Use of a Qualitative Research

Qualitative research design facilitates the exploration of a variety of subjective perspectives (Creswell et al., 2018). This study used a qualitative research design to comprehensively explore a variety of perspectives, including those at the macro (national-level policymakers), meso (organisational-level nursing supervisors and managers), and micro (practice-level primary healthcare nurses) levels. This made it feasible to achieve an in-depth exploration of the multiple aspects (subjective perspectives) that might influence readiness to expand nursing practice to include prescribing roles in Saudi primary healthcare centres, which is consistent with the researcher's subjective epistemology. Additionally, a qualitative research design is appropriate where reality is deemed to depend on the specific socio-cultural context (Guba et al., 1994); this in turn is consistent with the researcher's relativist ontological position, and thus enabling the gathering of rich data from participants about their readiness to include the prescribing role in nurse practice within the context of Saudi Arabia.

There is a broad range of qualitative research methodologies, each with its own emphasis and core characteristics; these include narrative, phenomenological, ethnographic, grounded theory and case study methodologies (Creswell et al., 2018). In narrative studies, the purpose is to gain a complete and accurate representation of individuals' life experiences by delving into their personal and social stories (Creswell et al., 2018). The narrative methodology emphasises the significance that an individual has in an event by means of storytelling. It reveals the connections between

words found in multiple texts, and it addresses the relationship between text and social reality (Tomaszewski et al., 2020). There are three factors considered in a narrative study: (a) the correspondence between an event sequences' chronological order and their presentation in the text; (b) the vocabulary and narrative methods employed to create various types of stories; and (c) the significance of the story to society and culture, and its purpose for the storyteller (Tomaszewski et al., 2020).

Phenomenological research is concerned with participants' actual lived experiences and the more profound meanings underlying them (Creswell et al., 2018). A phenomenological study consists of at least two different areas of focus. The first involves describing phenomena and centres on constructing descriptive categories based on participants' narrations of the world they observe. The second seeks to elucidate the composite events of the phenomenon and centres on how individuals' internal processes of attributing meaning have affected how they comprehend the significance of an experience (Tomaszewski et al., 2020).

Grounded theory (GT) is a research methodology that focuses on building theories retrospectively as opposed to testing theories developed pre hoc, based on analysis of data collected from the relevant context (Creswell et al., 2018). This methodology is suitable when there is relatively little knowledge about a phenomenon. The objective is to develop a theory that explains the nature of the data and reveals new theoretical inferences within the specific area of study. GT is distinguished by its objective to develop theory that is solidly grounded in the data (Chun Tie et al., 2019). There are different methodological foci adopted in different grounded theory studies.
The first (traditional) form of GT aims to develop theory that explains a pattern of behaviour that is important and challenging to those engaged in it or subjected to it.

The second is rooted in the works of Strauss, Corbin, and Clarke. It aims to theorise on the subjective meanings, actions, or perceived events that determine behaviour. Charmaz has established a third form, constructivist GT, which focuses on the way participants construct meaning within a specific context (Chun Tie et al., 2019).

Ethnographic research is concerned with describing and interpreting the behaviours and cultures of certain groups (Creswell et al., 2018). The purpose of carrying out ethnographic research is to determine the organisational structures of a cultural group and define the views or ideas that the group's members have in common. The key outcome of an ethnographic study is a detailed and comprehensive portrayal of the culture of a group, with the primary focus being on building knowledge of how the group works in relation to the primary subject matter of the study (Tomaszewski et al., 2020). Ethnography is strongly dependent on the observational skills of the researchers. The researchers use these skills during participant observations, extensive fieldwork, or extended periods of engagement with the culture under investigation (Tomaszewski et al., 2020).

Case study method entails the in-depth analysis and description of one or more empirical cases that exemplify the topic of study (Creswell et al., 2018). A case study is an investigation into the specifics and complexities of a case, with the goal of gaining an understanding of the behaviours and circumstances that characterise the case (Tomaszewski et al., 2020). Yin (2018) provides an overview of the key features of case studies. The first is that case studies seek to explore a contemporary phenomenon in detail and within its real-life context, particularly when the boundaries between the phenomenon and setting are not readily visible (Yin, 2018). There is a

strong connection between the phenomena and the context in which it occurs, yet the case being studied should be a bounded system which is clearly defined and delineated. Secondly, case studies consider the whole, complex range of phenomena that characterises the case by drawing from a variety of sources and forms of evidence (Yin, 2018).

These five qualitative research methodologies described above rely on interpreting the experiences of the participants, which were not considered appropriate to achieve the stated research aim and objectives. In contexts where nurse prescribing practices have already been established, qualitative research methodologies that focus on interpreting the experiences of participants do have the potential to afford valuable interpretive insights, but these methodologies may not be capable of providing the type of knowledge required to effectively address the research questions in the current study. Therefore, the current study does not adopt such methodological approaches to achieve the research objectives, as there is no precedent for nurse prescribing practice in Saudi PHCs. The unique context of this study led to the selection of exploratory-descriptive qualitative research (EDQ) as the methodology, given the absence of nurse prescribing practices in Saudi Arabian primary healthcare centres.

EDQ is a methodology used to achieve the objectives of a study in situations where the researcher aims to explore and describe perspectives that lack theoretical foundations (Hunter et al., 2019). In this case, exploratory and descriptive qualitative research might be conducted simultaneously (Hunter et al., 2019). Exploratory qualitative research, as defined by Stebbins (2001), is intentional, systematic, and planned research with the goal of identifying any generalisations that may help describe and explain specific aspects of social life. In cases where researchers are

attempting to find out more about a phenomenon in a somewhat previously unexplored area, where neither the theories nor the literature have significantly addressed the topic in question, these often begin as exploratory studies (Piovesan et al., 1995; Hunter et al., 2019). According to Reid-Searl et al. (2012), exploratory qualitative research offers a framework that motivates participants to contribute unique perspectives and insights, leading to the development of new knowledge in a given area.

Descriptive qualitative research is an approach that intends to provide a detailed understanding of a particular phenomenon by exploring the experiences, perceptions, and meanings of participants (Sandelowski, 2000). In contrast to phenomenological, ethnographic, grounded theory, or even narrative studies that are centred on interpreting study findings, the descriptive qualitative approach produces more naturalistic inquiries (Sandelowski, 2000). According to Sandelowski (2000), descriptive qualitative research is the approach of choice if the study's objectives revolve around providing an in-depth and direct description of a selected phenomenon. Holloway et al. (2010) also emphasised that describing a phenomenon enables a more comprehensive understanding of its significance and conveys insight from the participants' perspectives.

Recent studies have utilised EDQ research methodology to address critical gaps in nursing literature (Muhsin et al., 2020; Tebbs et al., 2021; Karahan et al., 2022). Muhsin et al. (2020) employed EDQ to explore the transitional experiences of nurses in community care, emphasising the need to investigate the distinct challenges they face during this transition. This methodology was crucial in gathering detailed narratives that illuminated previously unexplored experiences, guiding the

development of specific solutions. Tebbs et al. (2021) investigated a blended learning model in nursing education to understand its effects on student learning outcomes, using an exploratory descriptive qualitative approach. This research enabled a comprehensive understanding of students' perspectives, which is essential for refining educational practices. Similarly, Karahan et al. (2022) used EDQ to explore the coping strategies of nurses in challenging situations, recognising the importance of personal and contextual factors influencing their stress responses.

These studies utilised the EDQ approach to address research objectives derived from the intent to explore and describe areas that had not been previously explored (Muhsin et al., 2020; Tebbs et al., 2021; Karahan et al., 2022). The use of this methodology in nursing research is crucial for revealing insights into unexplored areas, facilitating the acquisition of robust narrative understandings that address gaps in existing literature and contextual factors.

3.3.3 Exploratory-Descriptive Qualitative Research: Strengths and Limitations

EDQ research has several advantages; however, its primary strength lies in its ability to fill gaps in the literature by exploring previously unexplored phenomena (Hunter et al., 2019). This methodology's exploratory nature allows participants to actively engage in knowledge generation, facilitating a more extensive understanding of the phenomena under investigation (Reid et al., 2005). In addition, this methodology's exploratory nature not only generates new perspectives, but also improves the relevance and validity of the results (Stebbins, 2001). Through a series of exploratory studies, researchers can thus systematically broaden their enquiries, extending the relevance of their findings across multiple contexts (Stebbins, 2001). Researchers commonly use the inductive approach in exploratory investigation, prioritising the

formulation of theoretical frameworks over the evaluation of pre-existing theories or hypotheses, thereby generating new knowledge (Stebbins, 2001). Alongside its exploratory features, EDQ research includes descriptive features that provide an in-depth description of the research phenomena from participants' perspectives (Holloway et al., 2010). The descriptive approach is naturally adaptable, which makes it easy to use different theoretical frameworks. This makes it easier to collect and understand data and make studies fit specific situations (Kim et al., 2017). This flexibility facilitates the use of theoretical frameworks to greatly enhance descriptive research, improving its depth and rigour (Doyle et al., 2020).

Nonetheless, it is important to acknowledge that EDQ research has certain significant limitations. Its exploratory nature means that it frequently begins with broad, open-ended research queries that can only be examined by discovery. This approach may thus result in diminished focus and significant ambiguity, hindering the formulation of specific research questions and objectives (Stebbins, 2001). Moreover, the findings of an exploratory investigation are often preliminary, requiring further investigation and confirmation (Stebbins, 2001). The exploratory approach also often uses a small sample size, which may limit the transferability of the findings (Sandelowski, 2010). Exploratory nature also commonly relies on an inductive approach, which can impede the development of in-depth understanding and the interpretation of findings based on existing theories or literature (Stebbins, 2001).

The descriptive facet of EDQ research also has distinct limits. As with other qualitative approaches, the descriptive approach often faces criticism for its lack of the scientific rigour more commonly linked to quantitative methodologies (Vaismoradi et al., 2013). This criticism is especially pertinent where descriptive

investigations do not emphasis theoretical grounds, placing them in contrast to other qualitative approaches that employ strong theoretical grounding, such as phenomenology or grounded theory (Neergaard et al., 2009). Such a lack of solid theoretical grounds could undermine the rigour and strength of descriptive investigations (Neergaard et al., 2009).

3.3.4 Rationale for Using Exploratory-Descriptive Qualitative Research

Primary healthcare nurses should become able to independently evaluate patients, make diagnoses, and prescribe medications in primary healthcare services, as emphasised in a special communication article published in the Annals of Saudi Medicine (Hibbert et al., 2017). Hibbert et al. (2017) also emphasised the growing significance of advanced practice nurses (APNs) in Saudi Arabia to alleviate the burden on the healthcare system and enhancing patient access to treatment in a timely and effective way (Hibbert et al., 2017).

In the first Saudi quantitative study conducted by Almotairy et al. (2023), a descriptive cross-sectional design was used to explore the readiness of nurses in Saudi Arabia to prescribe medications under supervision. Almotairy et al.'s (2023) study thus presented an overview of the attitudes and facilitators that might contribute to the implementation of nurse prescribing in Saudi Arabia. However, it failed to explicitly identify the contexts in which nurse prescribing practice could be implemented, and it did not completely capture the readiness to include prescribing roles in nursing practice in PHCs, as emphasised by Hibbert et al. (2017). This indicates that the theoretical foundation for readiness to include prescribing roles in nursing practice in Saudi Arabia's PHCs is lacking.

This study employed an EDQ methodology to explore readiness to include prescribing roles in nursing practice in Saudi Arabia's PHCs. The methodological novelty of this study holds significant importance, as neither the national nor international literature has previously employed a similar approach in the area of nurse prescribing practice. This study thus fills a methodological gap in the international literature by being the first to use EDQ research in the area of nurse prescribing practice. It also contributes to addressing the knowledge gaps and opens up opportunities for future research and growth through the investigation of a previously overlooked research area, thereby filling a key gap in the existing literature.

Nurse prescribing roles in Saudi primary healthcare centres is a novel concept, which explains the dearth of existing knowledge and theoretical foundations to support their implementation across Saudi Arabia. The flexibility of the EDQ methodology enabled the inclusion of a diverse range of participants, and their contributions to the development of knowledge in the study area justified its use in the current study (Hunter et al., 2019). This study utilised the EDQ research methodology to delve into the diverse viewpoints of nurses and other pertinent stakeholders, with the aim of gaining an understanding of the overall readiness to include prescribing roles into nursing practice in Saudi Arabia's primary healthcare centres. The choice of using this methodology allowed for the gathering of perceptions about the expected advantages of integrating a prescribing role into nursing practice within primary healthcare services, the potential nurse prescribing approach, its facilitators and barriers, and the changes that are needed for the successful implementation of this new role from nurses and other stakeholders. Consequently, this methodology

significantly contributed to the achievement of the research aim and objectives, as well as providing novel perspectives based on participants' contributions.

The EDQ research methodology has the ability to provide an in-depth description of the participants' perspectives (Hunter et al., 2019). In-depth description can be helpful in terms of directing practice, policy, and education reforms (Hunter et al., 2019). This feature further justifies its use by enabling a direct and in-depth description of the participants' perspectives in the current study. This, in turn, provided an effective contextual description of the study findings about the readiness to include a prescribing role in nursing practice in Saudi Arabia's primary healthcare centres. This contextual and in-depth description of the study's findings therefore has the potential to influence future legislation, education, and practice regarding the implementation of the nurse prescribing role in Saudi Arabia.

3.4 Theoretical Framework

3.4.1 Institutional theory

This study used institutional theory as its theoretical framework to guide data collection and the interpretation of the study's findings. Institutional theory is derived from a range of social science disciplines and research approaches, including ethnography, phenomenology, political science, organisational studies, and anthropology (DiMaggio & Powell, 1991). March and Olsen (1983) observed that human actions, social contexts, and institutions intermesh and interrelate in intricate and multipolar ways. This mesh of interactive processes of action and reaction, and the concomitant formulation of meaning are considered crucial to understanding social life and organisational change. It comprises the central principle of institutional theory. This framework for analysing social phenomena is based on the

conceptualisation of society as a collection of institutions characterised by enduring rules, practices, and structures (Lawrence et al., 2008). The theory directs attention to the more resilient elements of a social structure and investigates how these structures (schemas, rules, norms, and routines) create guidelines for social behaviour, examining the processes of their formation, dissemination, adoption and adaptation over time, as well as their eventual decline and abandonment (Scott, 2004).

Institutional theory has, however, developed over time, and the next section thus attempts to explore the evolution of this theory and its key developments as part of the rationale for its use.

3.4.2 The Evolution of Institutional Theory

3.4.2.1 Early Institutional Theory

Early institutional theory, commonly known as early institutionalism, emerged during the sixteenth century (Bodnieks, 2020). An essential element of this theory claims that government institutions fulfil a pivotal role in coordinating individual behaviour and reaching improved outcomes (Peter, 2019). Early institutionalists primarily focus on the behaviour of individuals and firms in economic and political contexts where conflicts of interest are prevalent, thus necessitating the establishment of explicit rules (Scott, 2014). Within the fields of economy and political science, early institutionalists contend that individuals and organisations generate rule systems and adhere to them to advance their interests by adopting a contributory and expedient approach. Consequently, institutionalists tend to analyse institutions via the lens of regulative policy analysis (Scott, 2014). The approach employed by early institutionalists was reliant upon knowledgeable observers who define and understand the environments in question (Peter, 2019). Additionally, early institutionalists utilise

inductive reasoning and strive to generalise their findings from specific cases (Nureev, 2005).

3.4.2.2 New Institutional Theory

An evolution of the early institutional theory resulted in the development of a new concept of institutional theory (known as new institutional theory), the foundations of which were created in the early 1980s (Bodnieks, 2020). New institutionalism emphasises legitimacy, the embedding of organisational fields, and the significance of classifications, standardised practices, guidelines, and schemas (Greenwood et al., 1996). The emergence of new institutionalist concepts highlights the interconnectedness of individuals and groups within larger systems and cultural contexts (Meyer, 2011). The shift in focus (away from early institutional theory) within contemporary political science can be traced back to the work of James March and Johan P. Olsen, who argued that the old institutionalists in political and social science minimised the importance of individual values, collective choices, and organisations (Peter, 2019). March and Olsen contended that the individualistic perspective and methodology of the old institutionalists undermined the central role of values in their analysis and failed to integrate individual action with fundamental normative analysis (Peter, 2019). By contrast, the new institutionalist perspective regards individual and group behaviours as bounded and independent actors (Peter, 2019). According to Meyer (2011), new institutionalists stress the need of using multiple lines of analysis, each providing a unique perspective on actor characteristics and the factors that impact them. In contrast to early institutionalism, which placed an emphasis on formal and tangible institutions including statutes, rules, and regulations, new institutionalism places more value on informal and intangible institutions including customs, beliefs, and practices (Lang, 2018).

3.4.2.3 Neo-Institutionalism

Institutional theory has undergone continuous evaluation, which has resulted in the development of a new concept known as neo-institutional theory, which emerged in 1991, as an extension of new institutional theory (Alvesson et al., 2019). Also known as organisational institutionalism (Sandhu, 2019). Neo-institutional theory provides a theoretical framework for analysing strategic communication (Sandhu, 2019). It is rooted in social constructivism and recognises the significance of cognitive-cultural assumptions in analysis (Sandhu, 2019). The neo-institutional theory challenges the sole reliance on normative analysis by emphasising the importance of the institutional subsystem, specifically the cultural-cognitive pillar, which cannot be fully assessed through normative analysis alone (Thornton et al., 2012).

Scott (2014) developed a novel concept known as neo-institutionalism, which integrates elements from both traditional and new institutional theory. This concept incorporates all aspects of both existing theories. According to Scott (2014), institutions comprise three interconnected pillars: regulative, normative, and cultural-cognitive, which provide stability and meaning to social life. The regulative pillar, operating at the macro-level, focuses on explicit regulatory processes, rulemaking, monitoring, and sanctions (Scott, 2014). Institutions play a crucial role in regulating behaviour within their boundaries and potentially shaping social behaviour at a broader societal level (Peter, 2019).

The normative pillar, which operates at the meso-level, focuses on normative rules that introduce evaluative, prescriptive, and compulsory elements into society (Scott, 2014). The normative pillar is strongly related to the normative aspect of new institutionalism (Peter, 2019). The cultural-cognitive pillar, operating at the micro-

level, encompasses the shared concepts of social reality and the development of frames through which meaning is constructed (Scott, 2014). It emphasises that institutions are socially constructed through the perceptions and cognitions of their members, rather than being objective in nature (Peter, 2019).

When combined, these pillars represent the fundamental principles that are vital components of institutions. The regulative pillar establishes rules and utilises sanctions to influence future behaviour (Scott, 2014); the normative pillar governs social life through prescriptive, evaluative, and obligatory rules which are guided by principles (Scott, 2014); and the cultural-cognitive pillar is characterised by the sharing of concepts concerning social reality and the development of frameworks that give meaning to it, based on underlying principles (Scott, 2014) (please see Figure 3).

	Regulative	Normative	Cultural-Cognitive
Basis of compliance	Expedience	Societal Obligation	Taken-for-grantedness Shared understanding
Basis of order	Regulative rules	Binding expectations	Constitutive Schema
Mechanisms	Coercive	Normative	Mimetic
Logic	Instrumentality	Appropriateness	Orthodoxy
Indicators	Rules Laws Sanctions	Certification Accreditation	Common beliefs Shared logics of action
Basis of legitimacy	Legally sanctioned	Morally governed	Comprehensible Recognisable Culturally supported

Figure 3: Institutional Pillars and their Components (Scott, 2014).

Incorporating institutional theories (old and new) into these three pillars-regulative (macro-level), normative (meso-level), and cultural-cognitive (micro-level)-reveals the theoretical foundations of institutional perspectives (Thornton et al., 2012). By highlighting the distinctions between these three pillars within sociology, this analysis

facilitates an improved understanding of institutions and their functions (Peter et al., 2019).

Multiple studies in the realm of healthcare research have used an institutional theory-based analytical approach in recent years (Smith et al., 2019; Taylor et al., 2021). Smith et al. (2019) conducted a qualitative approach to explore nurse practitioners' and their colleagues' perspectives on the enablers and hinders of expanding their practice scope. The researchers employed a socio-institutional model to analyse the gathered data and describe the barriers and facilitators at each level (macro, meso, and micro). Taylor et al. (2021) conducted a study that explored the perspectives of healthcare professionals (including physicians, nurses, and allied health professionals) on the expansion of pharmacy services in rural and remote areas. They used a multi-level approach to analysing data that encompassed macro-level (policy level), meso-level (health professional level), and micro-level (consumer and community level) perspectives.

3.4.2.4 Institutional Theory: Strengths and Limitations

There are several significant strengths for using institutional theory, including its ability to bridge multidisciplinary barriers within the social sciences. Through the integration of both micro, meso, and macro viewpoints, it leads to the development of more coherent and comprehensive knowledge of social structures and processes (Scott, 2014). It is possible to achieve this by employing a multi-dimensional approach that incorporates cultural, cognitive, and normative components. This provides a comprehensive understanding of the factors that contribute to the stability and change of institutions (Scott, 2005). According to Scott (2005), institutional theory makes it easier to conduct an analysis of the many kinds of actors and

organising models that exist within a field. This allows researchers to capture the full range of players and the roles that they play (Scott, 2005). Researchers gain significant insights into the mechanisms of institutional disruption and transformation if they identify and make use of revealing indicators of institutional change (Palthe, 2014). In addition to its capacity to systematically identify institutional changes and their causes over time, institutional theory also enables researchers to observe transitions in institutional arrangements (Scott et al., 2000). Institutional theory places a strong emphasis on institutional logics, which are the organising principles that regulate individuals' behaviour. This helps to explain why certain practices and institutions continue to exist or change (Scott, 2005).

The value of institutional theory in comprehending the effects of institutions on the behaviour of organisations and societies is tempered by some significant limitations. In institutional theory, the challenge inherent to measuring institutions is a significant constraint. While it is acknowledged that they exist, it is challenging to quantify their impact and ascertain the extent of their scope (Peters, 2000). Institutional theory is frequently criticised for its excessively rigid explanations, which fail to sufficiently account for the complexity and dynamism of modern political and organisational environments (Peters, 2000). Neo-institutional theory faces a challenge in the "paradox of embedded agency", which concerns the ability of human agency to both transform and establish itself within institutions. This paradox symbolises the tension between the propensity for creative and transformative human action and the limiting effects of institutional constraints (Seo et al., 2002).

Neo-institutional theory is criticised for not sufficiently accounting for the creative and revolutionary force of human agency. Although it recognises the existence of

agency, it often fails to express clearly how people can bring significant change within the confines of institutional structures (Willmott, 2011). In attempting to explain change, placing emphasis on institutional logics that are in contradiction with one another and inconsistent. Recognition of human beings as active contributors to social reproduction and change is hindered by the excessive reliance on logics and structures (Willmott, 2011). Neo-institutional theory often overlooks the mechanisms by which actors gain reflexivity and conscious intentionality. Much of the theory does not investigate in depth how people reflect on their embeddedness in institutions and make conscious efforts to modify organisations (Lawrence et al., 2011). In addition, neo-institutional theory is criticised for its tendency to restrain the routines and practices that are carried out daily to reproduce and modify institutions. As a result, it fails to consider the more ordinary but crucial components of institutional labour (Willmott, 2011). In institutional theory, there is a dualism that is strongly ingrained, which holds that people and institutions are poles apart from each other. However, this dualism often fails to critically account for the ways in which individuals and institutions are mutually constitutive (Willmott, 2011).

3.4.2.5 Rationale for Using Institutional Theory as a Theoretical Framework

The crucial role of theory in qualitative research has been repeatedly shown, with different theoretical frameworks promoting understanding of various study phenomena and informing methodological decisions (Collins et al., 2018). Maxwell (2013) presented theory as a critical tool to facilitate researchers' articulation of their assumptions, refinement of their research questions, and conduction of effective data analysis. The use of a theory in qualitative research serves as an interpretive lens to assist the researcher with making sense of the social setting under investigation (Anfara et al., 2013).

Theory is a fundamental component in PhD candidate research, directing investigations and enhancing the rigour of their work. Ideally, it offers a systematic framework that allows the formulation of research questions, establishment of hypotheses, and identification of pertinent variables (Wilkins et al., 2019). Through positioning research within established theoretical frameworks, students can also clarify the relationships between different concepts, a crucial step in developing cohesive arguments and guaranteeing methodological rigor (Creswell et al., 2018). Furthermore, engaging with existing theories enables PhD students to situate their research within the wider academic milieu, assisting them in recognising any deficiencies in current knowledge and permitting them to make novel contributions to their disciplines (Wilkins et al., 2019). This theoretical underpinning thus not only supports the validity of their findings but also enhances the practical relevance of their studies, hence expanding both their academic and professional knowledge (Van de Ven, 1989). However, it is crucial to exercise caution and to avoid overreliance on theory, as this may prevent the identification of emergent findings within the data (Merriam et al., 2016). Collins et al. (2018) thus posited that a balanced and thoughtful application of theory is required to significantly enhance the rigour and depth of research efforts and their findings.

A range of potential theoretical frameworks were considered during the development of this study, including Normalisation Process Theory (NPT) and Diffusion of Innovation (DOI) Theory. NPT, widely recognised for its application in understanding the implementation and sustainability of new practices, focuses on the social and organisational processes through which innovations are integrated into routine practice (May et al., 2009; Murray et al., 2010). DOI, developed by Rogers (2003), investigates the adoption and dissemination of innovations within social systems,

emphasising factors such as relative advantage, compatibility, and organisational conditions (Greenhalgh et al., 2004).

Although both frameworks provide valuable insights into the later stages of adoption and implementation, they do not sufficiently address contextual and systemic factors influencing readiness, including regulatory support, professional norms, and organisational infrastructure. Such institutional factors are particularly significant in primary healthcare settings in Saudi Arabia, where regulatory frameworks and cultural expectations play a critical role in shaping preparedness for including prescribing roles in nursing practice. Consequently, a more comprehensive framework was required to fully address the pre-implementation phase of readiness to integrate prescribing roles into nursing practice.

Institutional theory was selected as the theoretical framework in the current study. It acknowledges three primary mechanisms driving institutional change: coercive, mimetic, and normative isomorphism, as outlined by DiMaggio and Powell (1983). Coercive isomorphism arises from external pressures, such as political influences and the pursuit of legitimacy. Mimetic isomorphism, on the other hand, occurs in response to uncertainty, prompting organisations to emulate successful practices. Normative isomorphism is driven by professionalisation and the impact of shared norms and values within professional communities (DiMaggio & Powell, 1983). Institutional theory is particularly pertinent when exploring the introduction of new practice within institutions and organisations, as it highlights societal expectations, resistance, professional norms, and the drivers for embedding new practices (Thornton et al., 2012). The rationale for using institutional theory as theoretical framework lies in its capacity to elucidate the broader social and cultural factors influencing social contexts

and organisations. Therefore, institutional theory provides a theoretical lens through which to explore how existing cultural norms such as social expectations, resistance, and professional norms in Saudi Arabia shape the readiness to incorporate prescribing roles into nursing practice.

One of the key strengths of institutional theory is its ability to provide critical insights into the processes of institutional and organisational readiness for change, which are essential considerations for achieving sustainable implementation (Mizruchi et al., 1999; Scott, 2014; Latif et al., 2020). This emphasises the importance of factors such as regulatory and organisational changes in smoothing readiness for change (Scott, 2014). Thus, institutional theory provides a robust theoretical framework for understanding the interaction between regulatory policies and organisational practices, both of which are critical for ensuring that prescribing roles are not only introduced but also effectively sustained over time.

Overall, institutional theory provides a well-supported theoretical framework for this study by addressing the complex interplay of cultural expectations, and regulatory and organisational structures. It enables exploration of drivers, resistance, and readiness for change, providing understanding into the factors that underpin the successful integration and long-term sustainability of prescribing roles within nursing practice in Saudi primary healthcare centres.

The current study used institutional theory to inform both data collection and the interpretation of findings. The justification for using this theory to support data collection stemmed from its capacity to explore the antecedents of institutional mechanisms based on the three isomorphic pressures. Through integrating these three pressures into the development of the interview prompts, the researcher was then able

to effectively probe the various norms and institutional factors that influence readiness to adopt a prescribing role in nursing practice at multiple levels within the Saudi healthcare system. A significant strength of institutional theory, as noted by Thornton et al. (2012), is its ability to triangulate data from diverse social actors across different institutional levels. This approach thus enriched the study by allowing triangulation of a range of perspectives from participants situated within three distinct levels of the healthcare system, thus enhancing the depth and breadth of analysis.

Institutional theory provides a strong foundation for interpreting studies' findings, as it highlights the significance of social context and the influence of institutional environments on organisational behaviour (Mizruchi et al., 1999; Latif et al., 2020). In the current study, the three isomorphic dimensions of institutional theory, the coercive, mimetic, and normative, served as an interpretive framework for the study's findings. These isomorphic pressures provide a theoretical lens that allows the researcher to interpret the intricate social mechanisms at play. This lens not only facilitates a comprehensive understanding of the current pressures influencing participants' perceptions but also deepens the researcher's understanding of the institutional factors that shape readiness for integrating the prescribing role into nursing practice in Saudi PHCs.

The use of institutional theory as a theoretical framework informed data collection and the interpretation of the study's findings, as will be explained in the next sections.

3.4.2.5.1 Data Collection

In data collection, especially developing an interview schedule, institutional theory offers three isomorphisms to inform interview prompts.

Scott's regulative pillar aligns most closely with coercive isomorphism, which reflects the legal and regulatory constraints on institutions to conform to specific rules and norms (Thornton, 2012). When developing the interview prompts, the researcher thus aimed to investigate how government health policies and external pressures have affected the readiness of PHCs to incorporate prescribing practice into nursing practice (please see Section 3.9).

Normative isomorphism, associated with Scott's normative pillar, originates from the professional and ethical standards that develop via shared professionalisation and education (Thornton, 2012). The researcher thus formulated the interview prompts to investigate how the professional norms and values in the Saudi healthcare system may affect potential acceptance and integration of the nurse prescribing role into PHCs (please see Section 3.9).

Mimetic isomorphism, which ties into Scott's cultural-cognitive pillar, is driven by uncertainty, leading organisations to adopt only practices they perceive to be successful or legitimate (Thornton, 2012). Thus, the researcher developed the interview prompts to explore factors that might influence nurses' intentions to adopt a nurse prescribing role, as well examining as how leadership at the organisational level can effectively support the implementation of such roles. Additionally, the researcher developed prompts to explore how organisational changes could better facilitate the adoption of this role (please see Section 3.9).

The study also amalgamated a variety of data gathered through interviews with participants across three distinct levels in the Saudi institutional healthcare system, triangulating data from multiple social actors at the macro, meso, and micro levels. Triangulating insights from those at various macro-levels (policymakers), meso-levels

(managers and nursing supervisors), and micro-levels (nurses) led to the development of a deep and valid understanding of the ways in which institutional factors at various levels come together to influence the readiness to include prescribing roles in nursing practice in Saudi PHCs. This triangulation of perspectives from all three levels then supported the generation of thematic insights across the entire dataset (please see Figure 4).

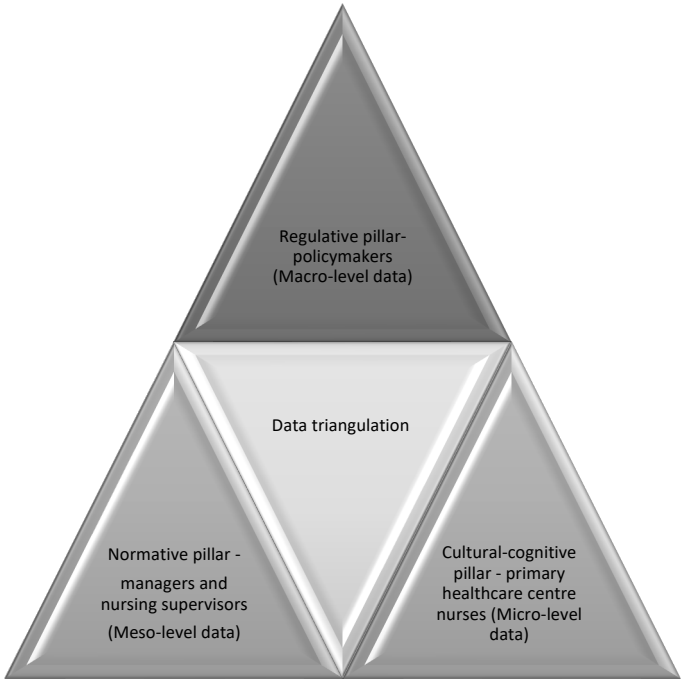


Figure 4 : Triangulation perspectives from three levels

3.4.2.5.2 Interpretation of study findings

Institutional theory was used as an interpretive lens to assist with the process of making sense of the study's findings. After independent reflexive thematic analysis of the study data in an inductive approach, the findings were interpreted through the lens of the three isomorphisms: coercive, mimetic, and normative (please see Figure 5).

The interpretation of the study's findings through the lenses of coercive, normative, and mimetic pressures supported the cultivation of an in-depth understanding of the

current institutional pressures on the introduction of a new practice (the nurse prescribing role), which in turn influenced and shaped participants' perceptions. Furthermore, it facilitated the acquisition of an in-depth knowledge regarding the ways in which these pressures interact with the implementation of the nurse prescribing role. The researcher was able to clarify the current institutional constraints (pressures) that might affect readiness to include the prescribing role in nursing practice in PHCs, as well as to examine how the interplay of these pressures could be utilised to more effectively implement the prescribing role in nursing practice within Saudi Arabia's existing healthcare system (please see Chapter 5).

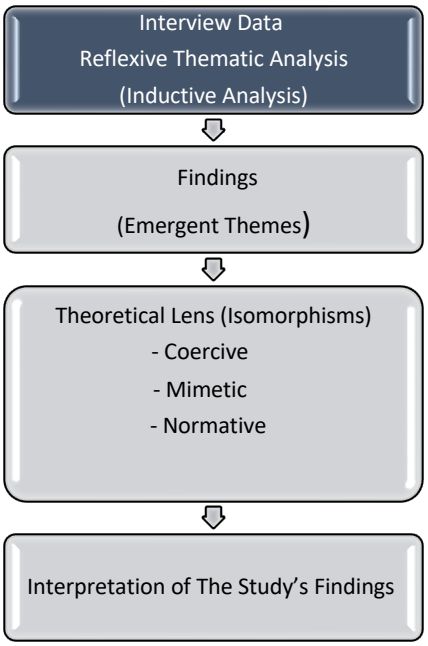


Figure 5:Reflexive Thematic Analysis and Theoretical Interpretation

3.5 Data Collection Method

A semi-structured interview method was used to collect the study data. The rationale for choosing was that semi-structured interviews combine structured and unstructured questions, which provide increased flexibility in interview questions. This approach

enabled the collection of specific information from all participants while simultaneously allowing them the opportunity to share their opinions and insights (Merriam, 2016; Kallio et al., 2016). This promotes the emergence of novel concepts and contributes to the richness of study findings (Bradshaw et al., 2017). In addition, interviewers always have the opportunity to ask follow-up questions and probe initial answers for further clarification, underpinning the approach's openness (Moser et al., 2018). This further supports the rationale for using a semi-structured interview, which allowed for a back-and-forth conversation between the researcher and the participant, leading to an in-depth understanding of the investigated phenomena. The participants had the choice to conduct the semi-structured interviews in Arabic or English; however, they conducted all of them in Arabic, except for one that was conducted in English.

Semi-structured interviews nonetheless have several limitations. One of their main drawbacks is the risk of interviewer bias, which occurs when the researcher's own assumptions, personal experiences, and biases impact the direction and emphasis of the interview (Roulston et al., 2015). To mitigate this, the researcher used a fixed interview schedule to ensure consistency across all interviews. Semi-structured interviews that rely on self-reported data may restrict the validity of the findings, as participants may experience embarrassment, memory lapses, or struggle to articulate their ideas and experiences effectively (Kakilla, 2021). In the current study, the researcher strived to create a comfortable and non-judgemental environment to encourage open communication.

When the interviewer loses focus or attempts to extrapolate unintended meaning from a difficult conversation, the semi-structured interviews will be of sub-standard quality

to a greater extent (Kakilla, 2021). The researcher ensured thorough preparation by reviewing the interview questions beforehand and taking brief notes during interviews to maintain focus and accurately capture critical points. The time-consuming nature of transcribing and analysing semi-structured interviews can be a major inherent limitation, particularly for qualitative studies with large samples or limited resources (Jamshed, 2014). To manage this limitation, the researcher utilised appropriate audio recording tools, including a digital voice recorder and Audacity (audio recording and editing software), to facilitate transcription. Additionally, the researcher streamlined the analysis process by using the qualitative data analysis software NVivo (version 12 for Macintosh).

3.6 Sampling

Two types of sampling were used: purposeful and snowballing sampling strategies. The following sections provide detailed explanations of these strategies.

3.6.1 Purposeful Sampling Strategy

This study used a purposeful sampling approach to select participants. Qualitative research commonly uses purposeful sampling to identify and select information-rich cases (Palinkas et al., 2015). This sampling approach ensured that the data collected was both rich and relevant, with a focus on input from those individuals best able to provide in-depth perspectives.

Purposeful sampling also has several limitations. One significant drawback is its inherent subjectivity, as the researcher's judgement plays a crucial role in selecting participants, which can introduce selection bias (Creswell et al., 2018). To manage this limitation, the researcher established clear, predefined criteria for participant selection based on the study's objectives. This may also help to prevent researcher's

preconceptions from influencing participant selection, which can lead to potential selection bias. Purposeful sampling can also lead to the over-representation of certain perspectives, which further limits the applicability of findings (Etikan et al., 2016). To overcome this limitation, the researcher endeavoured to recruit participants with varying levels of experience to achieve a diverse sample. This approach promoted balanced representation and enhanced the richness of the data.

3.6.2 Snowballing Sampling Strategy

A snowballing sampling approach was also used. Snowball sampling is a recognised sampling strategy for recruiting study participants who are not easily accessible or known to the researcher (Naderifar et al., 2017). The researchers did not directly recruit all participants; rather, they approached others who subsequently connected them to participants. This is a common sampling approach in qualitative research (Leighton et al., 2021).

One of the primary advantages of using snowball sampling is its ability to identify participants who meet specific inclusion criteria or who have certain required characteristics (Hennink et al., 2020). Another advantage of this sampling approach is that it leverages familiarity and trust between participants: those already involved in the study could provide information about the research to other potential participants, addressing any concerns and thus increasing overall participation rates (Hennink et al., 2020). Using the snowballing approach in this current study allowed the researcher to reach more potential participants and access individuals who were potentially suitable for the study. Following the initial interviews with selected participants (nursing supervisors, managers, and policymakers), the researcher asked for help in terms of finding and recommending other possible participants.

Snowball sampling does have a number of limitations. One of the most significant limitations is the potential for sampling bias. This is due to the sample's potential to not accurately reflect the broader population, as it heavily relies on the participants' networks (Handcock et al., 2011). It may also make participants feel uncomfortable about recommending people within their social networks, due to concerns around confidentiality and anonymity (Atkinson et al., 2001). According to Kirchherr et al. (2018), interviewees who have smaller networks are less likely to suggest other potential participants during an interview. Furthermore, obtaining a sufficient sample size through snowball sampling may be disadvantageous due to its time-consuming nature. This mostly happens because researchers rely on participants' willingness to recommend others during the study (Kirchherr et al., 2018). To address the limitations associated with solely relying on snowball sampling, the researcher employed a purposeful sampling strategy (please see Section 3.6.1).

3.6.3 Sample Size

Recruitment of participants continued until the study achieved data saturation. Data saturation was achieved once additional data collection did not reveal new insights or themes, suggesting that an adequate amount of data had been collected to fully understand the phenomenon (Fusch et al., 2015). One critical aspect of data saturation is that researchers conduct data collection, sampling, and analysis simultaneously in an iterative process (Rahimi et al., 2024). The researcher used an iterative approach to achieve data saturation within each group, gathering data, analysing it, and then using the findings (themes) to inform further data collection. The iterative approach continued until no further relevant information (new themes) emerged from the interview data within each group. Moreover, the researcher continuously compared and contrasted the data at the macro, meso, and micro levels to identify similarities

and differences in the emerging themes or concepts, which allowed for the identification of data saturation across the entire dataset. This involved identifying the recurrence of themes and the absence of new data from subsequent data collection.

3.7 Participants

The researcher's careful judgement, aligned with the aims and objectives of the study, should guide the selection of participants in qualitative research (Holloway et al., 2016). This study drew participants from multiple levels, including nurses at the micro-level, nursing supervisors and managers at the meso-level, and policymakers at the macro-level. This study drew participants from multiple levels, including nurses at the micro-level, nursing supervisors and managers at the meso-level, and policymakers at the macro-level. Each participant group was selected based on their unique experiential qualities, which were deemed critical in order to address the study's objectives. Nurses, representing the micro-level, brought their experiential insights derived directly from their clinical roles in PHCs. Their experiences encompassed day-to-day patient care, clinical decision-making, and a practical understanding of how prescribing responsibilities might influence their workflows and thus impact PHC services. At the meso-level, nursing supervisors and managers offered perspectives informed by their leadership roles, which included oversight of nursing teams, management of operational complexities, and addressing organisational readiness for the implementation of expanded roles. Their contributions thus provided valuable insights into workforce development, resource allocation, and interprofessional collaboration. Policymakers at the macro-level, contributed expertise grounded in their involvement in health policy development and governance. Their perspectives contributed valuable insight on legal requirements, regulatory

frameworks, and the more general strategic factors required to incorporate prescribing roles into the healthcare system.

To ensure that participants had the requisite characteristics to achieve the study's objectives, the researcher employed specific inclusion and exclusion criteria. These criteria were carefully designed to identify individuals whose professional roles, expertise, and experiences enabled them to provide meaningful and contextually relevant insights into the readiness of Saudi PHCs to adopt expanded prescribing roles for nurses. The next section describes these criteria in more detail.

3.7.1 Inclusion Criteria

The inclusion criteria were:

- Registered senior nursing technicians, nurse specialists, and senior nursing specialists (male and female with at least one year's experience) working in primary healthcare centre.
- Nursing supervisors and managers (male and female) who had at least one year's experience working in a primary healthcare centre as a manager or nursing supervisor (regardless of educational qualifications).
- Policymakers (male and female), including senior nursing specialists and nursing consultants, with at least one year's experience in policy development.

3.7.2 Exclusion Criteria

The exclusion criteria were:

- Unregistered nurses (students), nursing assistants, nursing technicians and nurses with less than one year's experience in primary healthcare centre.
- Nursing supervisors, managers and policymakers who had been in their positions for less than one year.

3.8 Recruitment

This section delves deeper into the recruitment process of various participant groups, providing specific details for each group.

3.8.1 Primary Healthcare Nurses

Nurses from three primary healthcare centres in city A and city B in Saudi Arabia were recruited for this study. To gain access to these healthcare centres, the researcher obtained three access letters from the gatekeepers of the centres (please see Appendices D, E, and F). The researcher made contact with the directors of the healthcare centres via email (please see Appendices G and H), and the directors were provided with facilitating the researcher's task (please see Appendix I). The directors were provided with the names of the primary healthcare centres, and they subsequently contacted the respective centres on behalf of the researcher.

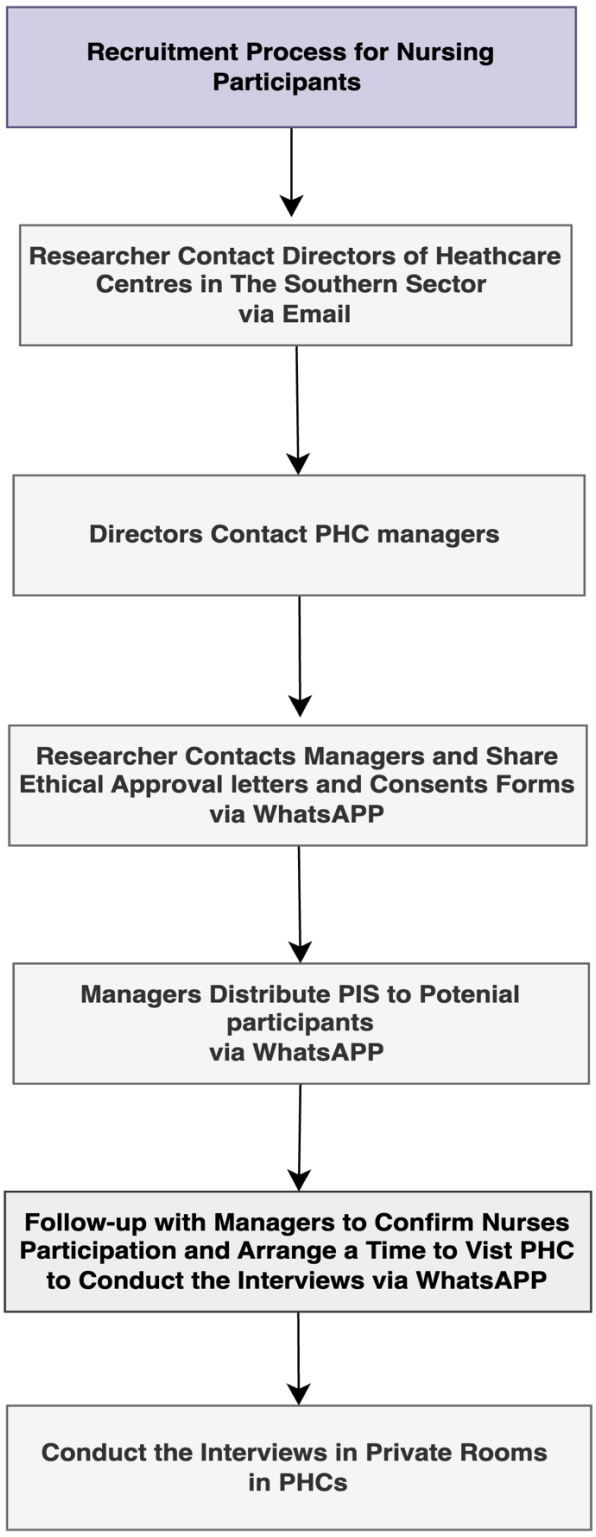
The researcher directly contacted the managers of the primary healthcare centres to arrange the necessary meetings, proactively inquired about the managers' document delivery preference, and forwarded the documents accordingly (via WhatsApp messaging service). Additionally, in advance of these meetings, the researcher shared the necessary ethical approval letters (Cardiff University ethical approval, please see Appendix J, and the Saudi Ministry of Health ethical approval, please see Appendix K), consent forms (Cardiff University consent form— please see Appendix L, and the Saudi Ministry of Health consent form— please see Appendix M) via WhatsApp (as per the managers' preferred mode of communication).

The recruitment process for nursing participants was conducted in collaboration with primary healthcare centre managers, who acted as gatekeepers and played a pivotal

role in identifying potential participants and facilitating their access. During the initial meetings, hard copies of the relevant study documents, including the participant information sheets (please see Appendix N), were provided to these managers. The researcher outlined the purpose of the study, detailed the inclusion criteria, and emphasised the importance of participant involvement. The managers were subsequently requested to assist in identifying eligible nurses who met the inclusion criteria and to distribute the participant information sheets to potential participants via the WhatsApp messaging service.

Prior to the researcher's second visit, the managers were re-contacted through the WhatsApp messaging service to confirm the willingness of the identified nurses to participate in the study. This follow-up communication ensured that interview arrangements were coordinated in line with the preferences of both the managers and the potential participants. Additionally, the managers facilitated access to private meeting rooms within the healthcare centres, ensuring a confidential and comfortable environment for conducting the interviews. The recruitment process for primary healthcare nurses is visually represented in Figure 6.

Figure 6: The recruitment process for primary healthcare nurses



3.8.2 Nursing Supervisors and Managers

In this study, nursing managers and supervisors were recruited using two approaches: initially, the researcher contacted individuals engaged in the process of recruiting nurses and asked whether or not they would be willing to participate in the study. This strategy facilitated the involvement of nursing supervisors and managers already active in nurse recruitment. A snowball sampling approach was then utilised to find more participants, with the nurse supervisors and managers asked to provide recommendations regarding other eligible individuals who might be interested in participating. This approach facilitated the detection of prospective participants who were not originally within the researcher's awareness but who had a relationship to existing participants.

In order to enhance collaboration and interaction, all relevant research materials (including the participant information sheets and interview schedule) were provided to interested participants using the messaging programme application WhatsApp. Interview times that were mutually convenient were then scheduled using that platform.

3.8.3 Policymakers

Nurse policymakers were recruited from the highest levels of nursing leadership within the Saudi Nurses Association, which operates under the oversight of the Ministry of Health in Riyadh city. To identify potential participants, the researcher visited the Saudi Nurses Association website, reviewed the profiles of its members, and their CVs and contact details. To begin interactions with prospective participants, the researcher then contacted them individually and provided them with the participant information sheet to ensure they understood the objective of the study and

were familiar with the process. This contact took place via email or WhatsApp, as did further clarification and discussion of the interview schedule and any other details after those contacted agreed to take part.

A snowball sampling approach was used to expand the number of participants. All initial participants were thus asked if they could suggest additional nurse policymakers who might be interested in taking part.

3.9 Data Collection Tool

An interview schedule was used to collect research data, which was formulated in accordance with the research objectives and developed through a review of existing research literature from the United Kingdom relating to the role of nurse prescribing (please see Appendix P). The use of an interview schedule is appropriate in qualitative research as it fulfils the crucial need for flexibility in qualitative interviewing. Unlike quantitative survey research, where the researchers often ask pre-set questions in a fixed order, qualitative interviews necessitate flexibility to explore participants' diverse perspectives on the subjects under study (King et al. 2019).

The utilisation of an interview schedule in the current study was justified by the need for flexibility in order to deal with unanticipated deviations during the interview process. The interview schedule includes open-ended questions, enabling participants to explain their viewpoints without restrictions (Sandelowski, 2000). This approach enabled the researcher to adapt to the participant's responses and explore unanticipated topics that align with the study's objectives. Such flexibility in the data collection process enhances the richness and complexity of the gathered data, resulting in an improved understanding of the participant's perspective (King et al., 2019).

The interview schedule was formulated following an in-depth review of literature pertaining to the role of nurse prescribing in the United Kingdom (Latter et al., 2004; Courtenay et al., 2007; Courtenay et al., 2008; Graham-Clarke et al., 2018). The researcher conducted a thorough exploration of the existing literature with a focus on nurse prescribing in the United Kingdom. The aim was to identify key themes pertinent to implementing the nurse prescribing role, and this detailed review built up a theoretical foundation that was then used to inform the development of relevant interview questions. Through the literature review, the researcher identified several critical areas of interest central to the role of nurse prescribing, such as regulatory frameworks, education, and acceptance of this role. The researcher thus ensured that the interview questions would focus on key elements of the nurse prescribing role, facilitating a deeper exploration of participant insights.

The interview schedule was structured into three distinct sections to cover specific aspects of the study's objectives. At the initiation of each interview (general questions), participants were asked a series of questions regarding their demographic information. The purpose of including these questions was both to gain contextual information regarding the participants and their backgrounds and to establish rapport by creating a comfortable environment for the interview. As these initial questions were straightforward, the participants were able to relax and develop a relationship with the interviewer (Hennink et al., 2020).

The central part of the interview schedule included the key questions, which were intentionally placed in the middle to facilitate effective rapport between the interviewer and interviewee (Hennink et al., 2020). These questions were designed to

accumulate the data needed to achieve the objectives of the study (Holloway et al., 2016; Hennink et al., 2020).

The prompts were used to enhance engagement and encourage participants to share their perspectives (King et al., 2019). Institutional theory establishes three distinct levels of influence that impact social institutions: micro (individual-mimetic isomorphism), meso (organisational-normative isomorphism), and macro (nation-coercive isomorphism) (Scott, 2014). The researcher used institutional theory (isomorphisms) as a theoretical framework to inform the interview schedule (prompts) in this study. By exploring these levels, participants provided substantial insights on the factors facilitating or hindering the adoption of nurse prescribing roles, and identified the necessary changes to implement nurse prescribing roles. The researcher devised interview questions that investigated the consequences of applying legal responsibilities, cultural norms, and social principles to the implementation of nurse prescribing roles as a way to gain a deeper understanding of the sociological and regulatory factors involved. One such example was the inclusion of the question "How have legal obligations impacted nurses' readiness for taking on the nurse prescribing role?" (Informed by coercive factors). Additional prompts were thus generated specifically for questions related to exploring barriers, facilitators, and required changes throughout the data collecting phase.

Moreover, the interview questions (prompts) were formulated with the intention of exposing information pertaining to the internal organisational structure, with a strong focus on factors including leadership support and resource availability, professional norms, and organisational culture. An instance of such a question was "What support systems or resources would be necessary to facilitate the integration of the nurse

prescribing role?" (Informed by normative factors). In addition, the researcher sought to determine how different perspectives and relationships might influence the implementation of nurse prescribing role. Several interview questions were thus designed to delve into the viewpoints and relationships of healthcare workers, such as "What motivates you to consider taking up the role of nurse prescribing?" (Which was Informed by mimetic factors).

During the interviews, probing questions were used to elicit more detailed information from the participants and to fill in any gaps in their initial responses. Follow-up questions were used to encourage participants to provide more elaborate explanations and deeper insights. Moreover, these probing questions served an essential role in terms of revealing any possible misconceptions and clarifying any uncertainties that emerged during the interviews (King et al., 2019). At the end of each interview, a final question was used to offer the participants the opportunity to bring up any new ideas or concepts not previously discussed (Hennink et al., 2020). The novel suggestions suggested by the participants were highly respected, and these were assessed as potential prompts for subsequent interviews (Hennink et al., 2020).

Two researcher supervisors with expertise in both qualitative research and using and developing interview schedules evaluated the interview schedule used in the current study. Additionally, one of these supervisors is a specialist in nurse prescribing practice.

3.9.1 Pilot Interviews

Four pilot interviews took place in July 2022. The pilot interviews included testing of the interview guide by conducting interviews with people who corresponded to the

intended interviewers in terms of their qualities, experiences, or backgrounds (Maxwell., 2013). The purpose of conducting pilot interviews was to test the effectiveness and relevance of the interview schedule and identify areas that could be improved. They also allowed the researcher to observe the participants' reactions to the questions, thus enabling her to identify any potential for misunderstanding. This approach generated beneficial outcomes in terms of enhancing the wording and structuring of the interviews, as well as the intended sequence of questions.

The researcher conducted the first pilot interview at the residences of a nurse who is currently working at primary healthcare centre. The researcher carefully reviewed the interview (listened to audio-recordings), took notes, and engaged with reflection to evaluate her own skills. The pilot interview was under thirty minutes, and no transcript was generated or utilised for data analysis.

After conducting the first pilot interview, the researcher gathered specific feedback from the participant. To improve clarity of interview questions as emphasised by the participant, the researcher revised the questions and made them more specific. For instance, the researcher changed the question "Do you support the implementation of nurse prescribing in Saudi Arabia?" to "How prepared do you feel the Saudi healthcare system is to integrate nurse prescribing in Saudi Arabia?" and added a prompt that included specific areas to consider, such as training programmes, regulatory frameworks, and acceptance. Similarly, the researcher replaced "What are the benefits of having nurse prescribing in Saudi Arabia?" with "To what extent do you think nurse prescribing in Saudi Arabia would be of benefit?". "What are the changes needed at the organisational level to implement nurse prescribing in Saudi Arabia?" was changed to "To what extent are specific changes required within

healthcare organisations to successfully implement the nurse prescribing role?" and a prompt was added that referred to specific areas to consider, such as operational adjustments, interprofessional collaboration, and administrative support. "What are the changes needed at the national level to implement nurse prescribing in Saudi Arabia?" was changed to "To what extent are changes at the national level necessary for the successful implementation of nurse prescribing in Saudi Arabia?" and the researcher added a prompt that included specific areas of policy and regulation. The researcher conducted another pilot interview with the same participant at the participants' residence to guarantee that the revised questions were understandable. This enabled the researcher to confirm that the revised questions were not difficult to understand. The outcome greatly improved the clarity of the interview questions, leading to no further changes. The researcher did not generate a transcript or use it for data analysis in this pilot interview.

The two remaining pilot interviews were conducted with a primary healthcare nurse and a primary healthcare manager through the Zoom online platform. The researcher's supervisors then evaluated the transcripts from these pilot interviews. The significance of averting direct questions in favour of focusing on providing additional follow-up questions was emphasised in the supervisors' feedback, and these comments were taken into consideration in subsequent interviews. These latter pilot interviews were included in the data analysis for the study being because no significant modifications were made to either the structure or content of the interview schedule after these pilot interviews were conducted.

Permission (recorded oral consent) was obtained from all three participants before the pilot interviews commenced to ensure that the necessary ethical considerations were adhered to.

3.10 Conducting Interviews

In this study, all semi-structured interviews were conducted in person or online synchronous interview. The interviews (whether face-to-face or online) were recorded solely in audio format and the researcher made use of note-taking during and after each interview (Holloway et al., 2016). These notes (keywords and phrases only) created opportunities for the researcher to probe the participants' responses via the use of follow-up questions. Additionally, note-taking allowed the researcher to reflect on the data, maintain focus, and minimise any potential distractions throughout the interview (Holloway et al., 2016).

The online synchronous interviews were conducted and recorded via Zoom (an online communication platform). The face-to-face interviews were recorded using a digital voice recorder. Both face-to-face and online synchronous interviews were also recorded using Audacity (audio recording and editing software) which facilitated the replaying of recorded voices and aided in the subsequent generation of transcripts.

The following sections offer a detailed explanation of face-to-face and online interviews, highlighting their advantages and discussing strategies to overcome the limitations associated with each approach.

3.10.1 Face-to-face Interviews

Face-to-face interviews were chosen as the preferred means of interviewing as they provide the opportunity to engage directly with participants in a suitable context to

facilitate the gathering of information via direct conversation (Dialsingh et al., 2008). Therefore, the researcher was able to observe nonverbal signals and contextual factors during the interviews, which enabled her to make the necessary adjustments to the interview process to minimise interruptions and guarantee participant comfort. This created an environment that encouraged participants to actively participate in the interviews, minimised interruptions, and facilitated longer and more in-depth discussions (Schober, 2018).

Face-to-face interviews provide the advantage of facilitating in-depth investigation and a deepened understanding of the research problem (Irvine et al., 2013). Oltmann (2016) argues that face-to-face interviews enable more honest and open responses because they allow the interviewer and participant to establish better rapport and a sense of trust. This is because having a conversation in person facilitates a more genuine exchange of ideas (Oltmann, 2016). Face-to-face interviews also have the advantage of allowing interviewers to explain their questions and make sure the interviewee comprehends their meaning (Janghorban et al., 2014). Face-to-face interviewers have greater flexibility in adapting their communication style to meet the individual needs of each participant. This enables the interviewers to meet the needs of the interviewee more effectively (Irvine et al., 2013). According to Deakin et al. (2014), the interviewer's physical presence in face-to-face interviews allows them to identify nonverbal signals, which can enrich the context and significance of verbal responses.

Although they can provide rich and specific data, face-to-face interviews are subject to a variety of limitations that have the potential to impact the authenticity and quality of a study. The interviewer's behaviour, tone of voice, or question format can

influence participant responses, potentially leading to interviewer bias (Opdenakker, 2006). It is critical to provide interviewers with training that teaches them to maintain a neutral stance and use established interview schedules with all participants to limit interviewer bias (Patton, 2015). To mitigate this limitation, the researcher attended an online seminar (provided by Cardiff University) and intensive readings on conducting interviews in order to learn how to maintain a neutral stance throughout the interviews. The researcher also avoided directing participants toward certain topics throughout the interviews and tried to follow up on their responses. The researcher also employed this approach in synchronous online interviews.

In face-to-face interviews, participants may exhibit social desirability, which is characterised by the offering of responses that they deem to be more socially acceptable than their genuine emotions or thoughts (Krumpal, 2013). The researcher assured the participants of the anonymity and confidentiality of their perspectives, which encouraged them to provide more truthful responses. Gill et al. (2008) assert that conducting face-to-face interviews can be time-consuming due to the need to coordinate schedules between the interviewer and participants. In addition to the significant financial requirements for travel, geographical constraints can also limit the accessibility of participants (Irvine et al., 2013). To mitigate these limitations, the researcher used a digital tool (the Zoom application) to conduct synchronous online interviews remotely. This improved the feasibility of recruiting participants from a variety of geographic regions. In addition, the researcher provided a variety of interview scheduling choices, such as evenings and weekends, to accommodate the schedules of the participants.

3.10.2 Online Interviews

Synchronous online interviews were also conducted; the Zoom application (a communication platform) was used to conduct interviews with individuals who were geographically distant from the researcher (King et al., 2019). In the current study, all interviews with policymakers were carried out via the Zoom platform due to their location in Riyadh city. A few participants, including managers, nurse supervisors, and nurses, also suggested that online interviews might be more convenient for them.

Conducting synchronous online interviews provides a range of advantages. They provide the opportunity to conduct interviews using audio or video tools, which makes it possible to engage in lively and collaborative communication while also giving the opportunity to directly question participants (Janghorban et al., 2014). The use of video cameras has the potential to generate engagement that is broadly equivalent to an in-person interview because it allows for some observation of non-verbal and social signals (Sullivan, 2012). A further key strength is that online interviews enable improved accessibility and flexibility for participants. Online interviews allow participants with time or location restrictions to participate at their own convenience (Deakin et al., 2014). With this flexibility, researchers may be able to overcome challenges in recruiting important participants and increasing the overall participation rate (Janghorban et al., 2014). Researchers can conduct interviews online without the need for traditional gatekeepers, especially in sensitive or clinical situations (Janghorban et al., 2014).

Although online interviews have certain advantages, they also have some disadvantages. The nature of online communication can result in greater rates of participant absenteeism or rescheduling in comparison with meetings that take place

face-to-face (Deakin et al., 2014). To mitigate this challenge, the researcher informed the participants of the interview schedule and proposed modifications if required. A limitation of synchronous online interview is that participants must have prior experience with online communication and have a certain level of digital literacy (Janghorban et al., 2014). The researcher provided instructions on use of the Zoom application and suggested in-person interviews as an alternative if participants have difficulties. Additionally, one of the most noticeable drawbacks of conducting online interviews is the challenges associated with establishing a rapport between the researcher and the participant (Varma et al., 2021). The researcher tries to overcome this challenge by engaging in contact with participants prior to the interview; this allows for establishing a rapport and a positive relationship with them.

Technical issues, such as internet instability, unexpected disconnections, and auditory problems, commonly occur in online interviews and can adversely affect the flow of the conversation (Seitz, 2016). In order to overcome these challenges, the researcher secured reliable internet connectivity beforehand and conducted a trial run with participants to confirm the strength of the signal prior to the actual interview. Additionally, the researcher conducted the synchronous online interviews in a quiet setting and advised the participants to do the same to enhance voice clarity. Unanticipated interruptions can increase the risk of unintentional disclosure of private information during online interviews, which can be a limitation (Newman et al., 2021). The researcher conducted synchronous online interviews in private settings and advised the participants to follow suit.

3.11 Data Analysis and Management

Reflexive thematic analysis was used to analyse the study data. Reflexive thematic analysis acknowledges the researcher' s subjective role in qualitative data interpretation (Braun & Clarke, 2021). This supported the justification for utilising reflexive thematic analysis, as this approach facilitates a deeper engagement with the data, enabling the exploration of the meanings of participants' perceptions (Braun & Clarke, 2021). The ability of reflexive thematic analysis to identify themes and patterns of meaning across datasets also served as justification for the decision to use it (Braun & Clarke, 2021).

This approach to data analysis offers flexibility in terms of coding the data both descriptively (semantic coding) and interpretively (latent coding) (Braun & Clarke, 2021). Utilising and combining different coding approaches allowed for an extensive and in-depth analysis of the datasets, resulting in an improved understanding of the participants' viewpoints. Reflexive thematic analysis supports both deductive and inductive approaches to the generation of themes from a dataset (Kiger et al., 2020; Braun & Clarke, 2021). This approach was thus employed to make it possible for an inductive analysis of the full dataset to be completed simultaneously with a focus on specific aspects or discoveries that might be explained using current theories.

Reflexive thematic analysis consists of six stages: (1) familiarisation with the dataset; (2) coding; (3) generating initial themes; (4) developing and reviewing themes; (5) refining, defining, and identifying themes; and (6) creating a final analytical report (Braun & Clarke, 2021). Each step was carried out in a systematic manner in this study to ensure rigorous analysis of the data; an in-depth description of each phase is provided below.

3.11.1 Familiarisation with the Dataset

The familiarisation process includes three key practices: immersion, critical engagement, and note-making (Braun & Clarke, 2021). To achieve immersion in the data, the researcher conducted all interviews and subsequently transcribed them independently, which allowed the researcher to become intimately acquainted with the contents of the data prior to attempting coding. Following each interview, transcripts were generated using a two-stage process to ensure transcription accuracy. During the first stage, the transcripts were initially written in Arabic (the language used by all participants except one). The researcher then conducted an initial analysis and made notes in both Arabic and English. The accuracy of the transcripts was then cross-checked against the audio-recordings to allow any errors to be rectified. In the second stage, the Arabic transcripts were converted to English. To reduce any possible loss of Arabic narrative data, the researcher chose translations that stayed close to the raw data, conserving the participants' words, and keeping extensive notes with elaborate descriptions of what was heard throughout the interview process. A minimum of two days was required to complete this process for a single interview transcript. Two English transcripts of the interviews were shared with the researcher supervisors in order to obtain feedback on the way these were written. The researcher received entirely positive feedback, devoid of any negative comments.

Each transcript was reviewed and re-evaluated twice during the immersion process, and each audio recording was examined at least once. The purpose of this active involvement in the data immersion process was to prevent researcher assumptions from influencing the research data. The critical need to acquire greater awareness of the data while being aware of any assumptions was thus acknowledged.

Critical involvement was an important aspect of the whole process, based on identifying similarities and patterns within the dataset across different participation levels. The process included asking questions about the dataset's content and continually improving the clarity of questions in subsequent interviews. Integrating immersion and critical engagement allowed for a thorough understanding of the data that goes beyond surface-level information, enabling links with previous international literature (Braun & Clarke, 2021).

Throughout immersion and critical engagement, notes were taken in both Arabic and English, initially to record any emerging insights gained from familiarisation and critical engagement with the data. Following that, a systematic note-taking was used to gain a deeper understanding of the entire dataset and to record of any possible patterns or questions that arose. These notes were extremely helpful in improving understanding of the data.

3.11.2 Coding

Qualitative data coding is an effective strategy for organising and structuring otherwise unstructured data (Vanover et al., 2022). Coding allows researchers to engage with data in a systematic manner, meticulously examining each detail and using tags to identify segments that may contain relevant insights (Vanover et al., 2022). The researcher coded all the English transcripts in this study, but found that some data segments needed multiple codes to capture their various meanings. Consequently, the ongoing coding process sought to ensure that each code corresponded to a single meaning to avoid any overlap of multiple meanings.

Software can be a useful tool for storing and organising data, improving a researcher's ability to navigate effectively across a dataset (Creswell et al. 2018). The

researcher used NVivo qualitative software (version 12 for Macintosh) to support the process of coding and data management. The use of NVivo offered several advantages including easy access to the data and the ability to organise and structure it efficiently. The entire dataset (macro, meso, and micro data) was coded in a single analysis covering two cycles of coding, as discussed in the next few sections.

3.11.2.1 First Cycle of Coding (Descriptive Coding)

The initial cycle of coding focused on descriptive coding (semantic codes), with the intention of examining the data's surface-level meaning while teasing out the participants' perspectives (Braun & Clarke, 2021). For this purpose, two types of codes were used: descriptive coding, which included summarising text by using one or more words to convey the meaning of the data, and in-vivo coding, which involved labelling and classifying the data using participants' own terminology (Saldaña, 2021). These coding approaches allowed for an inductive analysis of the data and engagement with the meanings emerging from that data (data-driven coding). Example transcripts illustrating the development of descriptive coding and in-vivo coding are included in Appendix Q.

Following the initial coding process, two interview transcripts were shared with the research supervisors. The purpose of this was to verify the quality of the coding and to seek feedback on the coding process. The feedback emphasised that each code needed to represent a specific meaning (rather than capturing multiple meanings), and this suggestion was adhered to throughout the subsequent coding process.

3.11.2.2 Second Cycle of Coding (Interpretive Coding)

The second cycle of coding concentrated on interpretative coding (latent coding), which intended to find deeper meanings and key concepts stressed by the participants (Vanover et al., 2022). Two distinct types of interpretative codes were used. Latent coding (researcher-driven, conceptual) was used to develop a greater understanding of various implicit and conceptual meanings (Braun & Clarke, 2021). This coding approach seeks to investigate any underlying concepts or patterns present in the data. After that, pattern coding was used to group codes into a smaller number of categories and themes, which facilitated the identification of recurring patterns and overarching concepts in the data (Saldaña, 2021). Example transcripts demonstrating the development of latent coding and pattern coding are included in Appendix Q.

During the coding process, a gradual development in comprehension of the significance of the study's data emerged. This progression offered the researcher a more profound understanding and facilitated the identification of common interpretations across codes (Braun & Clarke, 2021). The inclusion of further codes was thus stopped after sufficient categories were generated to reflect the various meanings found in the data (Braun & Clarke, 2021). The dataset received a minimum of two rounds of evaluation prior to cessation of code label development in order to guarantee accuracy and consistency (Braun & Clarke, 2021).

3.11.3 Generating Initial Themes

The third stage involved examining the coded and aggregated data extracts to identify potential themes (Kiger et al., 2020). During this phase, the initial themes emerged, in accordance with the early phases of theme development. The analysis thus shifted

focus from smaller units (categories) to broader patterns of meaning (themes) (Braun & Clarke, 2021).

The researcher actively interacted with the codes to identify areas where similarities and shared meanings emerged across the entire dataset (macro, meso, and micro levels). Subsequently, the researcher grouped interconnected codes into more comprehensive categories to create descriptions and organise "manifest content" of the dataset (Nowell et al., 2017). The researcher subsequently grouped the 36 emerging categories into 12 sub-themes and six initial candidate themes (please see Table 2).

Thematic analysis involves generating initial themes based on unity of meaning and conceptual coherence (Braun & Clarke, 2021). Each initial theme thus had a distinct central organising concept to achieve conceptual clarity, and these were identified using inductive analysis, being directly derived from the coded data (Braun & Clarke, 2021). This approach guaranteed that the identified themes were tightly linked to the original data and accurately represented the dataset.

Subthemes were developed within the four primary themes to offer a more concentrated analytical perspective on certain facets of those themes. These subthemes were strongly linked to the central themes, strengthening the exploration of the key concepts (Braun & Clarke, 2021). The initial candidate themes selected were those that captured multiple facets that shared the same central concepts and were relevant to the research questions (Braun & Clarke, 2021). Detailed notes were taken for all themes that had the potential to be significant during this phase of the analysis.

Thematic maps were used to visually clarify the relationships between the themes and to represent the interrelationship between concepts both within and across the primary themes and subthemes (please see Figure 7).

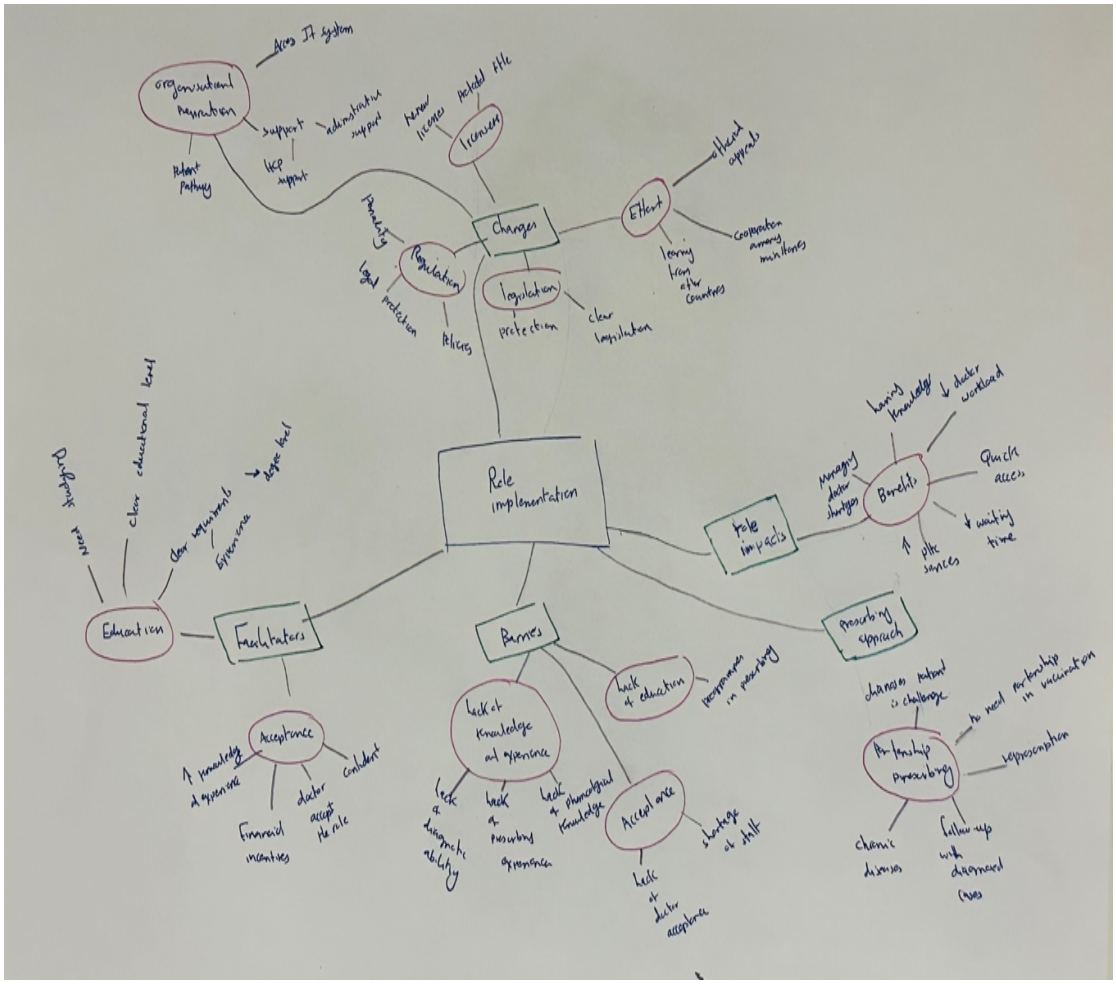


Figure 7:Mapping out potential themes during a thematic analysis.

Table 2: Categories Along with Their Sub-Themes and The Developing of Themes

Theme 1: Improving primary healthcare services **Sub-theme:** Increased accessibility **Categories** 1-Category: Enhance patients' accessibility 2 -Category: Help PHC to manage doctor shortage **Sub-theme:** Reduced waiting times **Categories** 3- Category: Reducing wait times for patients 4- Category: Quick access to service 5- Category: Reducing patients' complaints **Theme 2: Nurse-doctor partnership prescribing** **Categories** 6- Partnership prescribing 7-Category: Limited prescribing authority 8-Category: Area of nurse prescribing	**Theme 3: Educational preparation** **Sub-theme:** The need to study pharmacology and diagnosis **Categories** 9-Category: Need study 10-Category: Lack of knowledge and experience in prescribing 11-Category: Practical training is needed **Sub-theme:** Determining educational pathways **Categories** 12-Category: Educational pathway **Sub-theme:** Clarifying entry requirements for nurse prescribing programmes **Categories** 13- Category: Candidate experience level 14- Category: Candidate degree level **Theme 4: Stakeholders' Acceptability of the NP Role** **Categories** **Sub-theme:** Lack of Acceptability 15- Category: Lack of patient acceptability 16-Category: lack of HCP acceptability 17-Category: Lack of nurse acceptability **Sub-theme:** Enhancement of Acceptability 18-Category: Enhance acceptability by patients 19- Category: Enhance acceptability among nurses 20-Category: Enhance acceptability among doctors	**Theme 5: Establishing the legality of nursing prescribing practice** **Sub-theme:** Legislation and regulations **Categories** 21-Category: Legislation and regulation 22-Category: Effort to make legislation and regulations **Sub-theme:** Licensed nursing prescribing practice **Categories** 23-Category: Licensure process 24- Category: Job title 25- Category: Renew of the license **Theme 6: Primary healthcare centre readiness** **Sub-theme:** Changing PHC infrastructure **Categories** 26-Category: 1-1 IT system 27-Category: PHC clinics 28: Category: Patient pathway 29-Category: Leadership responsibility **Sub-theme:** Supporting the nurse prescribing role **Categories** 30-Category: Administration support 31-Category: Knowledge sharing support 32-Catgegory: Emotional support **Sub-theme:** Ensuring safe prescribing practice **Categories** 33-Category: Prescribe in area of competency 34- Category: Monitoring prescribing practice 35-Category: Patients' evaluation 36-Category: CPD

3.11.4 Developing and Reviewing Themes

During this phase, re-engagement with all the coded data extracts and the entire dataset was undertaken (Braun & Clarke, 2021). The primary objective was to review the viability of the initial clustering and to explore opportunities for further pattern development.

The initial themes were assessed to guarantee their independent significance and their coherent contribution to the development of a full analytical narrative (Braun & Clarke, 2021; Kiger et al., 2020). The purpose of this review was to improve and modify the themes in order to represent and reflect the coded data more accurately. Throughout this stage of data analysis, comprehensive documentation was generated to detail the decisions taken regarding theme development and revision. These notes served as an audit trail, guaranteeing openness and traceability in the analytical process, and they also assisted in establishing linkages between themes.

The themes were revised based on a thorough re-reading and revision of the codes, considering the full dataset (Braun & Clarke, 2021). Initially, this process involved conducting multiple readings of the entire dataset to guarantee an in-depth understanding of the data, which enabled the identification of contextual aspects that may have been overlooked during the initial coding process. Following this, the initial codes were reviewed and revised. General codes were split into more specific ones to capture distinct concepts, while similar or overlapping codes were combined to create more comprehensive ones. For example, after discerning significant overlap codes, the researcher made the decision to combine the codes "*lack of patient confidence*" and "*patient confidence in nurses*" into a single code referred to as "*patient confidence in nurse prescribing*".

The theme identified as *Stakeholder Acceptability of the NP Role* developed two sub-themes: *Lack of Acceptability* and *Enhancement of Acceptability*. However, data convergence between these two sub-themes was noted. Accordingly, it was decided to combine the data from both sub-themes into the primary theme, which led to a decrease from twelve sub-themes to 10 sub-themes. The revised themes captured the ultimate meaning emerging from the data. The revisions continued until all relevant data, that is, all data aligned with the research question and themes, were appropriately reflected and further refinements could not generate significant changes (Kiger et al., 2020).

3.11.5 Refining, Defining, and Naming Themes

Braun and Clarke (2006) state that defining and refining themes involves determining each theme's central idea as well as the specific facets of the data that it highlights. An in-depth written analysis was carried out to unpack the participants' "stories" that were represented by each theme. This was done to make sure that each theme was able to fit into the overall narrative of the research data and to reduce overlaps that may have occurred across themes. This necessitated the development of detailed descriptions of each theme's boundaries and core concept; this was important in properly capturing the essential characteristics of the data under each theme and within the sub-themes (Braun & Clarke, 2021). The researcher recorded all these descriptions. This not only ensured that every theme was articulated in a way that was consistent with the overall narrative of the study findings; it also resulted in a fuller and more extensive understanding of each of the themes within their overall context. The refinement process also involved deciding whether themes should have sub-themes (Braun and Clarke, 2006).

In the process of revising theme names, both the names of the main themes and their respective sub-themes were carefully reviewed to ensure that the names were informative, concise, accurately descriptive and captured the essence of each theme and sub-theme (Braun & Clarke, 2021). As a result, one theme, *Stakeholder Accessibility of the NP Role*, was amended to *Acceptability of the NP Role,* and one sub-theme, *Determining Educational Pathways,* was amended to *Determining Educational Level*.

To prepare for the final report, the refined, defined, themes with their revised names, along with selected data extracts (quotations), were presented in a table format. This was shared with the research supervisors before the researcher commenced the write-up of the findings (please see Appendix R).

3.11.6 Writing up the Analytical Report

This final step involves writing up the final analysis and description of findings (Braun & Clarke, 2021). In writing the analytic narratives to present all findings, the emphasis was on providing a detailed explanation of each theme rather than only relying on individual data extracts. The analytic narratives were supported by the inclusion of illustrative data extracts, including participant quotations, which provided evidence for the interpretations (Braun & Clarke, 2021).

When selecting the data extracts, efforts were made to include quotations from participants representing the macro, meso, and micro levels where possible. This approach sought to ensure the triangulation of data and improve the accuracy of the resulting interpretations of findings. The analytic narratives, which included narrative descriptions and supporting quotations, allowed for a comprehensive understanding of each theme, thereby conveying the core of the participants' viewpoints.

3.12 Trustworthiness of the Research Data

The trustworthiness of a research study can be defined as the degree of confidence that may be placed in its data, interpretations, and methods (Pilot et al., 2014). Sustaining the rigour of qualitative studies is an area of significant discussion, and traditional criteria for rigour, including external and internal validity, reliability, and objectivity, despite being frequently employed in quantitative studies, commonly fail to have direct applicability to qualitative research (Flick, 2018).

In response to this, Lincoln and Guba (1985) proposed a reconceptualisation of these criteria and thus defined four quality criteria for qualitative research: confirmability, credibility, transferability, and dependability. Qualitative researchers have thus largely adopted these criteria to replace ideas of internal validity, external validity, reliability, and objectivity (Merriam, 2016). However, in 1994, Lincoln and Guba proposed authenticity as a further quality criterion. The following sections discussed how these five criteria were met in the current study.

3.12.1 Credibility

In qualitative research, credibility, which replaces internal validity (Holloway et al., 2016), is an essential criterion in terms of demonstrating confidence in the validity of the research process and its findings (Polit et al., 2014). In contrast to quantitative research, qualitative research does not seek to reveal a singular objective truth; rather, it acknowledges the holistic, multidimensional, and constantly evolving nature of reality (Merriam, 2016). This means that qualitative researchers must utilise a variety of approaches in order to strengthen the credibility of their findings and guarantee congruence with participants' actual experiences.

Triangulation offers an essential approach to strengthening credibility based on the gathering of data from various sources, including the use of different methods and/or the involvement of multiple investigators (Creswell et al., 2018). Triangulation guarantees the accuracy and trustworthiness of data, enabling cross-checking and verification (Creswell et al., 2018). Although the current study used a single method (semi-structured interviews) for data collection, the data was triangulated through obtaining it from multiple participant groups (macro, meso, and micro levels). This supported the credibility of the study's findings.

Researchers can use a purposeful sampling strategy to enhance the credibility of their study's findings (Palinkas et al., 2015). The current study employed a purposeful sampling strategy to select significant perspectives from participants who could offer valuable insights based on their expertise in the Saudi healthcare system at all levels. The recruitment of participants capable of offering pertinent insights was thus prioritised in an effort to increase the credibility of the study findings.

To further enhance the credibility of the findings in qualitative research, Lincoln and Guba (1985) proposed member checking, also known as respondent validation (Merriam, 2016; Holloway et al., 2016). This involves asking for participant feedback to confirm that the findings properly indicate their intended meanings (Kornbluh, 2015). Holloway et al. (2016) further suggested that member checks facilitate the minimisation of misinterpretations or misunderstandings of participants' words. Before conducting the interviews, the researcher asked participants if they would be willing to review their interview transcripts in English; however, some participants declined due to difficulties in understanding the English language. Eleven interviews' transcripts were checked by participants, including five nurses, two policymakers, two

managers, and two nursing supervisors. One week was provided for participants to provide feedback, and of the ten participants who did offer feedback, all of them stated that their transcripts accurately reflected their intended meanings. One participant asked for modifications to his interview transcript. The researcher accepted the participant's suggestion to change request to include "nurse prescribing should not be under direct supervision (because) it will raise the effort" to "nurse prescribing should not be under direct supervision; it will raise the effort and cost". The researcher sent the revised transcript back to the participant for review and approval after incorporating this change, ensuring it addressed his request and maintained the authenticity of the data. In May 2023, the researcher shared the initial findings from data analysis with three participants (two nurses and one manager) to solicit their feedback on the analyses' accuracy. The participants validated the generated findings and provided no further feedback.

Peer review, also referred to as peer debriefing, served to further enhance credibility (Holloway et al., 2016). To attain an independent evaluation, two transcripts of the pilot interview and two transcripts of subsequent interviews were shared with the two project supervisors. The two supervisors provided valuable feedback and identified potential areas for improvement, such as refraining from direct questioning during interviews to prevent participants from providing direct responses, thus enhancing the overall credibility of the study.

It is necessary to engage with the data for a sufficient period of time in order to improve the credibility during the data analysis (Saldaña, 2021). The researcher engaged with the data for a sufficient period of time (eight months in total), which also enhanced credibility during the data analysis.

3.12.2 Transferability

Lincoln and Guba (1985) introduced the term transferability to replace generalisability to highlight how the findings of a qualitative study might be transferred to similar contexts or participant groups (Holloway et al., 2016). The term refers to the degree to which the findings of a study may be transferred to similar or different situations or settings (Ahmed, 2024). Qualitative researchers can enhance the transferability of their study's findings by providing detailed explanations of participant groups and their demographic details, research settings, data collection methods, and detailed descriptions of the findings (Ahmed, 2024). This allows readers to evaluate how applicable the findings are to similar situations (Ahmed, 2024). The researcher provided a detailed description of the data collection method, sampling, participant groups, inclusion and exclusion criteria, research settings, and data collection tool to enhance transferability (please refer to Sections 3.5, 3.6, 3.7, 3.8, and 3.9). Furthermore, the researcher provided full descriptions of the identified themes, supported by quotations from participant interviews, as detailed in Chapter 4. This aimed to allow readers to assess the possible relevance of the findings in comparable contexts.

3.12.3 Dependability

The term dependability has been proposed as a substitute for reliability by Lincoln and Guba (1985) (Holloway et al., 2016). The term refers to the general conclusions of the research being consistent and unmodified throughout the course of the investigation (Holloway et al., 2016).

In qualitative studies, to ensure that their conclusions can be dependable, researchers must make sure they clearly document the rationale behind key research decisions,

including the choice of research design, methodology, data collection, and analysis data (Ahmed, 2024). The researcher clarified the rationale behind the research design (please see Section 3.3), research methodology (please see Section 3.3.4), theoretical framework (please see Section 3.4.2.5), data collecting method (please see Section 3.5), and data analysis (please see Section 3.11).

According to Saldaña (2021), increased dependability may be achieved by coding the data, taking a break, and then recoding it to check for consistency. To improve the dependability, the researcher used a robust coding process (a code-break-recode strategy). The researcher first carried out a comprehensive coding of the data. Prior to returning the data, the researcher waited around a week before revisiting it. The researcher sought to suspend any previously held beliefs or preconceptions that may have originally influenced the initial coding process. After returning to the data, the researcher conducted a new analysis and found no differences in the coding between the initial and later coding.

3.12.4 Confirmability

In qualitative studies, researchers use the term confirmability instead of objectivity to address the need to establish inter-subjectivity among data and to promote neutrality (Holloway et al., 2016; Moser et al., 2018). The concept of confirmability thus highlights the importance of interpreting data independently of researcher biases and personal beliefs (Moser et al., 2018).

Poor translations of the transcripts from participant interviews can jeopardise the qualitative data (Squires, 2009). However, qualitative researchers used two methods for translation: forward translation and back translation. Forward translation involves converting from the original language to the target language. Back

translation involves translating from the target language back to the original language to check for discrepancies (Toma et al., 2017). This allows accurate representation of participants' views and enhances the study's overall objectivity (Toma et al., 2017). In the current study, the researcher used forward and back translation approaches. This involved translating the text from the original language (Arabic) to the target language (English), followed by a back translation that translated the text to the original language to verify equivalency. This ensured a high degree of confirmability in the translation of the materials prior to the initial data analysis.

Confirmability was further achieved by aligning the research findings and conclusions with the objectives of the project rather than these being driven by the researcher's prior assumptions and preconceptions (Holloway et al., 2016). Throughout the coding and analysis process, the research questions were thus frequently referred to, ensuring continual consideration of the research objectives.

3.12.5 Authenticity

Authenticity has been identified as one of the five major criteria necessary for promoting trustworthiness in qualitative research (Holloway et al., 2016). Authenticity refers to the confidence that the participants' authentic perspectives reveal (Holloway et al., 2016). To achieve authenticity, fairness, ontological authenticity, educative authenticity, catalytic authenticity, and tactical authenticity need to be followed (Amin et al., 2020). However, fairness was the primary criterion achieved in this current study. Fairness was ensured by obtaining informed consent from each participant, either in hard copy or as a digital record, or both. The researcher collaborated with participants at all stages of the research process to ensure that the information shared was accurate and that the participants had consented to it.

The researcher used the same interview schedule for all interviews, regardless of the interviewees' levels, but varied the prompts for each participant level. This provided all participants with a chance to convey their viewpoints. Furthermore, data from all interviews were analysed using the same analytical approach (reflexive thematic analysis) to ensure a systematic and consistent analysis process.

3.13 Reflexivity

Reflexivity is a critical aspect of ensuring trustworthiness in qualitative research (Adler, 2022). It involves the researcher openly discussing and reflecting on the ways in which their social position regarding the research and participants may impact their ability to maintain objectivity with readers. Both the researcher's impact on the participants and the participants' influence on the researcher are potential sources of bias and misinterpretation (Adler, 2022). Reflexivity thus offers an opportunity for researchers to maintain intellectual integrity by encouraging ongoing self-evaluation and deliberate efforts to remove biases that could compromise objectivity at any point during the research process (Adler, 2022). Omos-Vega et al. (2023) highlighted a range of domains involving reflexivity, including personal, interpersonal, methodological, and contextual areas. The next sections thus illustrate instances in which the researcher implemented reflectivity during the research process.

3.13.1 Personal reflexivity

Personal reflexivity involves reflecting on and clarifying the researcher's expectations, assumptions, and conscious and unconscious responses to contexts, participants and collected data (Omos-Vega et al., 2023).

Previous literature on nurse prescribing roles and institutional pressures influenced the interview schedule (prompts), but it was also necessary to adapt the prompts to be

relevant to primary healthcare in Saudi Arabia. In order to guarantee the contextual pertinence of these prompts, two approaches were thus adopted: initially, this involved an in-depth review of current Saudi literature pertaining to primary healthcare services. The objective in thoroughly reviewing this literature was to guarantee that the interview prompts formulated reflected the distinctive attributes and differentiations of the healthcare system in Saudi Arabia. Additionally, attempts were made to initiate conversations with primary healthcare centres nurses with the objective of acquiring a deeper understanding of nurses' routine duties, the guidelines they adhere to when following up cases with patients, and the variety of conditions they encounter on a daily basis. It was crucial to validate and refine the interview prompts using insights gleaned from these discussions, and in this manner, research prompts specifically tailored to the Saudi healthcare system were ensured.

The researcher developed a heightened awareness of the potential impact that personal biases and assumptions might have imposed on interpretation of the interviewees' words while transcribing the interviews. To mitigate this, a literal translation approach was used when converting the Arabic transcriptions to English. Rather than applying paraphrasing or interpretation, the literal and authentic expression of the participants' Arabic words was utilised to convey the original meaning of those words in the translated English text.

During data analysis, the importance of ongoing self-reflection and acknowledging subjectivity was recognised; this could also have been impacted by the literature on the role of the nurse prescribing. An inductive approach was thus applied in order to maintain objectivity and prevent the literature from introducing any potential bias into the data analysis. The analysis was thus firmly grounded in the perspectives of the

participants, rather than relying on preconceived notions obtained from the literature, based on the direct generation of codes and categories from the data. However, it is important to acknowledge that certain components of the data posed challenges in terms of understanding and establishing relationships between categories and managing this required reference to the international literature (specifically British literature) concerning the role of nurse prescribing to facilitate development of greater understanding. The existing body of literature thus facilitated the acquisition of insights.

In the process of selecting supporting quotations, the researcher carefully reviewed her assumptions to identify any possible biases towards prioritising certain viewpoints (quotes) over others. To minimise such bias, predetermined criteria were designed and followed for the selection of quotes. Sections were evaluated according to their clarity, conciseness, and conformity to the explained themes, and care was taken to avoid excess quotes from specific participants, with supporting quotes sought from participants at all different levels.

3.13.2 Interpersonal reflexivity

Interpersonal reflexivity focuses on the social aspects of research, particularly the relationships between researchers and participants. This assertion stresses the need to recognise that the collection of data is a conversational process with ethical responsibilities (Omos-Vega et al., 2023).

In this regard, the researcher had a lack of prior familiarity with the gatekeepers and nurses in the primary healthcare centres where data was collected; these were not the venues for her training or work experience with the Ministry of Health. This was

deliberate, based on a decision to avoid introducing bias or unintentional pressure on the gatekeepers or participants in terms of information disclosure.

To ensure compliance with ethical obligations regarding participant recruitment, permission from the managers (gatekeepers) at all relevant primary healthcare centres was obtained, along with the necessary access letters. Although certain managers (gatekeepers) provided permission verbally without formally awarding access letters, a decision was made to limit interactions to those gatekeepers who provided the appropriate permission letters. This approach guaranteed the ethical conduct of the recruitment process for potential participants.

The researcher maintained a conscientious awareness of the dual imperative of establishing rapport with the participants and exercising caution in order to keep her perspectives from potentially influencing them. The researcher's own opinions did not influence the participants, allowing them to freely convey their viewpoints.

3.13.3 Methodological reflexivity

According to Omos-Vega et al. (2023), methodological reflexivity requires researchers to thoroughly investigate the intricate details of the outcomes arising from their methodical approaches. The use of semi-structured interviews may result in interviewer bias. To minimise interviewer bias, the researcher conducted self-reflection on positionality, which involved identifying any potential biases that could have influenced participants during interviews. In addition, the researcher actively listened throughout her interactions with the participants during interviews and relied on open-ended questions to mitigate any biases.

3.13.4 Contextual reflexivity

Omos-Vega et al. (2023) define this as the act of locating a research project inside its cultural context and acknowledging the impact of the surrounding social context on the research process.

The cultural context has a substantial influence on the current study, including the availability of participants, their desire to participate, and the accessibility of facilities. In light of the researcher's limited ability to identify nursing participants with different educational backgrounds, experiences, and levels of interest in participation, she implemented the use of snowball sampling to guarantee a broad representation of participants with these qualities.

Some participants and gatekeepers were more familiar with quantitative research, and they lacked awareness of the methods of data collection in the current study. The researcher took the time to explain the benefits of qualitative research and related data gathering approaches. Furthermore, the researcher ensured that each participant understood and felt comfortable with the study, devoting special attention to individuals' specific needs and providing further explanations as required. Cultural context also had an effect on the accessibility of participants, as many gatekeepers were not familiar with the idea of permitting researchers access to their healthcare facilities. The researcher responded by requesting ethical approval from Saudi Arabia's Institutional Review Board (IRB), showing recognition of the need to gain ethical approval. The researcher included a supportive letter from the Institutional Review Board (IRB) to further reassure the gatekeepers about the ethical and respectful conduct of the study within the primary healthcare environment.

The most positive aspect of the researcher being without previous professional expertise in the relevant primary healthcare centres was the objectivity this offered to the study derived from a lack of any biases that might potentially impact the conclusions of the research. Nevertheless, the limitations posed by the researcher's dearth of professional expertise in primary healthcare centres must also be acknowledged. The researcher's lack of professional experience may have impeded understanding of the complexities in primary healthcare centres, for example, she attempted to mitigate this by maintaining regular interactions with nurses and managers at the primary healthcare centres, thus gaining contextual understanding.

3.14 Ethical Considerations

The ethical approval for this study was obtained from the School of Healthcare Sciences Research Ethics Committee (SREC) at Cardiff University (SREC reference: REC884) (please see Appendix J). Ethical approval was obtained from the Saudi Arabia Institutional Review Board (IRB) (IRB Log No: REC-02-07-2022) (please see Appendix K). Research integrity training was provided by Cardiff University and was undertaken on 10 April 2022 (please see Appendix R). A good clinical practice course was completed on 14 June 2022 as a prerequisite for applying for ethical approval from the Saudi Arabian IRB (please see Appendix S).

The potential participants were provided with participant information sheets that contained detailed information about the study, their right to participate, and their right to withdraw (Creswell et al., 2018). They were provided with the opportunity to ask questions and seek clarification before deciding to participate in the interview (Doody et al., 2013). One week was given for potential participants to consider their participation and provide informed consent. Informed consent forms were collected

from participants via email or WhatsApp (based on their preferred method of communication). Participants were required to sign the written consent form and return it to the researcher before conducting the interview. Verbal consent to participate in the interview was also obtained and recorded at the beginning of each interview. Participants were informed that the signed consent forms would be retained for five years (in accordance with the University Records Retention Schedule). Some participants, particularly policymakers, chose to provide verbal consent instead of signing the consent form, but agreed to provide verbal consent, which was recorded.

Participants were informed that anonymised transcriptions would be retained for five years in accordance with the University Records Retention Schedule and that once the retention period had elapsed, all records would be securely destroyed. Any identifiable personal information, such as names and contact details provided by participants for interview scheduling purposes, would be securely maintained for less than a year. This information, written in Arabic, was shared with potential participants along with the interview questions and was read aloud and recorded by the researcher at the beginning of each interview (please see Appendix T).

Before each interview, the researcher explained the interview process to the participants and reiterated the voluntary nature of their participation (Holloway et al., 2016). The researcher informed the participants that they could withdraw from the study at any point without facing any penalties, and they had the option to either withdraw from the interview process or request the withdrawal of their data after the interview (King et al., 2019). None of the participants elected to cease the interviews or withdraw their information at any point.

The researcher allowed participants sufficient time to seek additional details beyond what was provided in the participant information sheets. Participants were informed that face-to-face and online interviews would only be audio-recorded. In cases where participants refused to consent to audio recording, handwritten records were considered as an alternative (King et al., 2019). However, all participants agreed to have their interviews audio recorded. They were also informed that the audio recordings would be accessed only by the researcher, who transcribed the interviews in both Arabic and English without relying on a third-party transcription service.

Confidentiality of information obtained during the interview was assured to the participants. They were reminded not to disclose any personally identifiable information, such as full names and addresses, during the audio recording. Immediately after each interview, the audio recordings were converted into anonymised transcripts. Each interviewee was identified using a unique number on both the digital file and the transcription document to maintain confidentiality (King et al., 2019). Participants were informed that the researcher's supervisory teams may access anonymised transcripts of their interviews to which they provided their agreement. Any reports, publications, or presentations derived from the study would not contain participant-identifying information and only anonymised excerpts or verbatim quotes would be used for such purposes.

3.15 Data storage

Research records, including study protocols, interview schedules, information sheets, ethical approvals, participant consent forms, analysed research data, and research findings, were securely stored. The researcher applied for the research data store

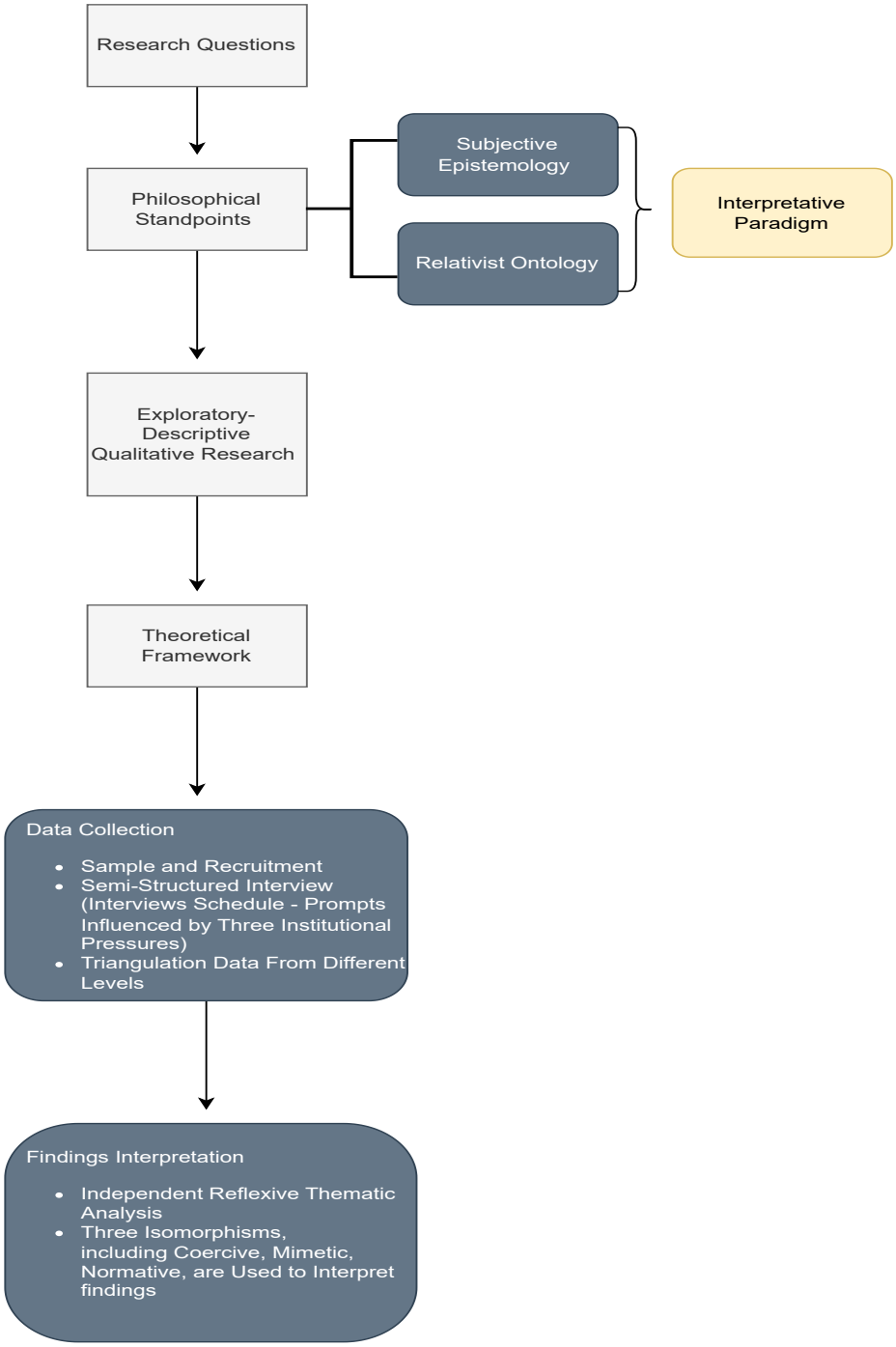
(RDS) electronic service to store the research data. To ensure off-campus access to the RDS, the researcher utilised the university's virtual private network (VPN) available to postgraduate students. Electronic data were adequately protected with password encryption to ensure their security.

3.16 Summary

This chapter presented a detailed discussion of the philosophical underpinnings and research methodology applied to meet the research objectives. In addition, the chapter provided a clear discussion of the nature of exploratory descriptive qualitative research and the rationale underlying the selection of this specific methodological approach. The chapter also provided a detailed description of institutional theory, which served as the study's theoretical framework. The chapter provided a comprehensive explanation of the data collection approach and discussed the use of reflexive thematic analysis (RTA) for data analysis. Figure 8 below provides a visual summary of the research process.

Finally, the chapter addressed several important considerations regarding research trustworthiness, reflexivity, ethical issues, and data storage procedures. The next chapter thus delves into the key findings that emerged from the qualitative data, offering rich insights into the perspectives of study participants.

Figure 8: Mapping the research process: philosophy, paradigm, and research design, and theoretical framework.



Chapter 4: Findings

4.0 Introduction

This chapter presents the findings obtained from this current study. It contains a clear overview of the data gathered and the demographic information about the participants. The findings will be presented under the themes and sub-themes to answer each research question.

4.1 Summary of data

Twenty-five interviews were conducted in total and the participants included nurses (n = 10), managers and nursing supervisors (n = 10) and policymakers (n = 5). The interviews were conducted face-to-face or online (via the Zoom application). A total of thirteen interviews were conducted online, while the remaining twelve interviews were conducted in person. The duration of the interviews varied widely, ranging from 18 to 65 minutes resulting in an average interview time of 38.14 minutes.

4.2 Description of Participants

4.2.1 Micro-level Nurse Participants

The majority of nurse participants were female, recruited from three primary healthcare centres. Table 3 provides a detailed description of the participants' demographic data. The majority of the participants fell within the age range 30 to 33. The experience level of the nurse specialists ranged from five to seven years, while the senior nurse technicians had worked in primary healthcare centres for one to ten years. Overall, most participants had between six and 15 years of experience in nursing.

4.2.2 Meso-level Managers and Nursing Supervisor Participants

The majority of these participants were female, with only three male managers recruited. Table 3 presents a detailed description of the participants' demographic data. Most of the participants in this group were aged between 30 and 43; they had an average of two to six years of experience in administrative positions and between seven and 21 years of experience working in primary care facilities.

4.2.3 Macro-level Policymaker Participants

The majority of participants were female, with two male participants. The demographic data for participants is described in detail in Table 3. They ranged in age from 40 to 63, and their average experience developing nursing policies ranged from one to 38 years.

Table 3: Participant Demographic Data

Participant Demographic Data	Frequency and Percent (%)
Job Title	
Nurses	
• Nurse specialist	• 6 (60%)
• Senior nurse technician	• 4 (40%)
Managers	
• Pharmacist	• 2 (40%)
• Senior nurse technician	• 2 (40%)
• Administrator	• 1(20%)
Nursing supervisors	
• Senior Nurse specialist	• 1(20%)
• Nurse specialist	• 2 (40%)
• Senior nurse technician	• 2 (40%)
Nursing Policymakers	
• Professor	• 2 (40%)
• Nursing consultant	• 1(20%)
• Senior Nurse specialist	• 2(40%)
Age Range (years)	
• 20–30	• 2 (8%)
• 31–40	• 14 (56%)
• 41–50	• 6 (24%)
• 51–60	• 2 (8%)
• 61–70	• 1 (4%)
Gender	
• Female	• 19 (76%)
• Male	• 6 (24 %)
Academic Qualifications	
• PhD degree	• 3 (12%)
• Master's degree	• 5 (20%)
• Bachelor's degree	• 9 (36%)
• Higher nursing diploma	• 8 (32%)

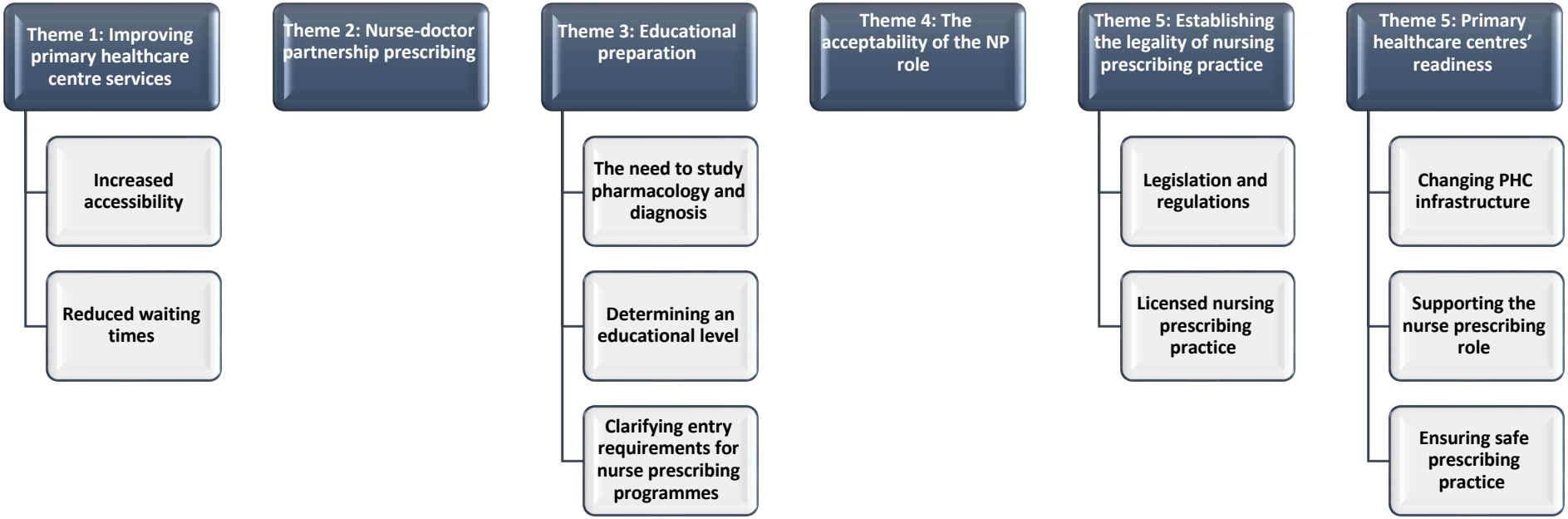
Table 3 continued: Participant Demographic Data

Participant Demographic Data	Frequency and Percent (%)
Years of Experience in Current Role	
Nurses (Senior Nurse specialist / Nurse specialist/ Senior nurse technician)	
• 1–10	• 10 (100%)
• 11–20	• 0 (0%)
• 21–30	• 0 (0%)
• 31–40	• 0 (0%)
Managers (Pharmacist/ Administrator/ Senior nurse technician**)**	
• 1–10	• 10 (100%)
• 11–20	• 0 (0%)
• 21–30	• 0 (0%)
• 31–40	• 0 (0%)
Nursing supervisors (Nurse specialist/ Senior nurse technician**)**	
• 1–10	• 10 (100%)
• 11–20	• 0 (0%)
• 21–30	• 0 (0%)
• 31–40	• 0 (0%)
Nursing Policymakers	
Professor	
• 1–10	• 0 (0%)
• 11–20	• 0 (0%)
• 21–30	• 0 (0%)
• 31–40	• 2 (40%)
Nursing consultant	
• 1–10	• 0 (0%)
• 11–20	• 1 (20%)
• 21–30	• 0 (0%)
• 31–40	• 0 (0%)
Senior Nurse specialist	
• 1–10	• 2 (40%)
• 11–20	• 0 (0%)
• 21–30	• 0 (0%)
• 31–40	• 0 (0%)

4.3 Themes and Sub-Themes

There were six themes and ten sub-themes generated from the data analysis (please see Figure 9). Themes and sub-themes are presented below under each of the research questions. The findings are illustrated by anonymous quotations followed by codes in brackets that indicate the participant group: P = policymaker, M = manager, NS = nursing supervisor, and N = nurse. Each code has a unique number to distinguish responses from different individuals within the group.

Figure 9: The Six Themes and Their Ten Sub-themes



4.4 Research Question 1: What are the perspectives at the macro level (policymakers), meso level (nursing supervisors and managers), and micro level (nurses) regarding the introduction of the role of nurse prescribers in Saudi Arabian primary healthcare centres?

4.4.1 Improving Primary Healthcare Centre Services

This theme pertains to the potential benefits that the introduction of the nurse prescribing role could have on Saudi primary healthcare services. This theme includes two sub-themes: increased accessibility and reduced wait times.

4.4.1.1 Increased accessibility

The majority of policymakers, managers and nurses agreed that expanding nursing practice to include the authority to prescribe medications would enhance accessibility to primary healthcare services and medications. This would result in significantly improved primary healthcare services for patients.

> "*I expect that it [nurse prescribing] will contribute very significantly to helping primary healthcare centres to improve their services by increasing accessibility to healthcare service for service users [patients]*" *(P1).*

> "*Patients will be able to access care if the nurses can expand their services … This will increase access to healthcare services*" *(M2).*

> "*…it is possible to benefit patients through increasing access to services where they receive their medications from nurses*" *(N5).*

A policymaker and a nurse highlighted that the demand for primary healthcare services in Saudi Arabia is expected to increase as the population grows and chronic diseases become more prevalent. Expanding nurses' role to include prescribing was seen as

facilitating patient access to the medical healthcare and medication that are needed to meet this growing demand.

> "*Chronic diseases are becoming more prevalent, and many patients use primary healthcare services to get their medications .... This role [nurse prescribing role] may increase access to the medications they need*" *(P5).*

> "*In light of the increasing demand, this role [nurse prescribing role] will contribute to increasing accessibility. The number of clinics is expanding .... The population is growing, so this is helpful for alleviating a crisis*" *(N5).*

One policymaker and one manager emphasised that during times of seasonal diseases or other outbreaks, nurses could provide access to medications, especially when there are fewer doctors available and more patients seek medical healthcare at primary healthcare centres.

> "*When there are seasonal diseases [common cold] or outbreaks [COVID-19], we need someone who is prepared to act quickly and who knows what to do to assist doctors ... There is no risk involved with them [nurses] prescribing medications in such cases, I believe nurses are capable of doing so*" *(P3).*

> "*With a limited number of doctors and during a seasonal disease outbreak [such as seasonal influenza], more patients visit the centres with the same symptoms ... If nurses could prescribe medications, we could enhance accessibility for them [patients]*" *(M4).*

The majority of managers, nursing supervisors and nurses viewed that the delay in accessing medications was attributed to the current shortage of doctors, which was viewed as the main current challenge for primary healthcare centres. Enabling nurses to play a role by expanding their practice and prescribing medications was viewed as a means of solving this challenge.

"*Primary healthcare centres are currently facing challenges concerning a shortage of doctors …. This causes delays for patients accessing healthcare: allowing nurses to prescribe medications will increase patient access to healthcare*" *(M1).*

"*The shortage of doctors is a permanent obstacle in healthcare centres that reasons a delay in obtaining medications for the patient…. Nurse who can expand their practice and prescribe medications can definitely help to increase access to healthcare services*" *(NS2).*

"*Nurses will be available … for patients so that it does not take the patient more than a day or two to find a doctor before accessing medications…. A patient can come at any time during the day and access the service*" *(N3).*

Some policymakers, managers, and nurses have suggested that nurses with the authority to prescribe medications could potentially enhance access to healthcare and medications in rural and remote areas facing a severe shortage of doctors and medical coverage, primarily due to doctors' unwillingness to work in such remote and rural locations.

"*Desert regions are remote, and no one wants to work there. Pakistani or Indian doctors are hired by the Ministry of Health, but these are not enough. Roles such as nursing prescribing will help to increase patients' access to their care*" *(P3).*

"*In rural or remote primary healthcare centres, this role will be useful. During night shifts, having a nurse on duty who can prescribe medication is helpful*" *(M3).*

"*[the] Nurse prescribing role has a potential to expand accessibility to primary care, especially in the underserved and remote regions…. Their [nurses] ability to independently manage a wide range of patient conditions could greatly benefit populations with limited access to physicians*" *(N 10).*

Some nursing supervisors and nurses viewed that the nurse prescribing role would improve patient access to follow-up appointments. It was reported that it would make appointments easier to schedule, particularly for patients with chronic illnesses, as regular medical appointments are challenging to obtain.

> "*Sometimes, there is a difficulty with patients gaining regular access to doctors to monitor their conditions, particularly for patients with chronic diseases …. I think nurse prescribing roles can help to increase their accessibility*" *(NS4).*
>
> "*Chronically ill patients will especially benefit from this role [nurse prescribing role] …. Patients can get their appointment easily*" *(NS2).*
>
> "*Accessibility to healthcare can be enhanced, especially for chronic disease patients who need regular follow-ups …. We [nurses]can follow up on their cases*" *(N4).*

Two policymakers perceived that nurses who can prescribe medications would have an effective role to play in increasing regular patient accessibility to care, as they can consistently monitor the patients' condition and therefore reduce the risk of complications associated with chronic diseases.

> "*Regular accessibility will be increased for patients who need regular access to healthcare services to monitor their cases and to receive their medications; this role [nurse prescribing role] will thus help them and manage the incidence of complications*" *(P5).*
>
> "*This role [nurse prescribing role] is likely to benefit the patient by reducing the risk of complications that may occur …. As accessibility for patients with chronic diseases will be increased, their conditions will be monitored more closely*" *(P4).*

4.4.1.2 Reduced waiting times

The majority of policymakers, managers and nurses expected that by implementing a nurse prescribing role in primary healthcare centres, the time that patients would have to wait for care and medication would be reduced.

> "*We can improve service levels by reducing the average waiting period for patients: if a nurse can be found competent to prescribe medications, this will shorten the waiting period for patients in primary healthcare centres*" *(P4).*

> "*Nursing professionals play an important role in improving patient services … I think we can gain benefit from nurses' skills and reduce patients' waiting time*" *(M5).*

> *"Waiting time will be reduced…Instead of waiting for half an hour to receive their medications, they will only have to wait 5 or 10 minutes to wait" (N 7).*

A policymaker, a nursing supervisor and a nurse recognised that in primary healthcare centres, nurses are the first point of contact with patients, so having the ability to prescribe medications would facilitate timely treatment for patients.

> "*The first person a patient encounters when seeking primary healthcare is a nurse. It will be easier for nurses to provide patients with timely care when they [nurses] are able to prescribe medications as well*" *(P4).*

> *"Nursing is the first station to receive the patient by making a nursing care plan, making an assessment, and ending with giving medication …. Patients will receive timely care and medications" (NS3).*

> "*Nurses are the first line of contact for patients in the centre so if nurses are able to prescribe medications, this will be helpful for the patients…. Medications will be timely provided*" *(N7).*

The majority of policymakers, managers and nurses agreed that if nurses were able to prescribe medication, Saudi primary care centres would be able to provide patients

with a shorter pathway to access services. Patients would no longer have to wait for a doctor to see them.

> "*Patients would not need to see the family medicine doctor; instead, their pathway will be stopped at the clinic, where nurses can prescribe their medications, and they can return home immediately. No more procedures … or waiting will be required*" *(P4).*

> "*Nurse prescribing role has the potential to improve healthcare provision, allowing patients to receive quicker access to treatments without the need for a doctor's visit*" *(M2).*

> "*I can prescribe their medications in the same clinic without needing to increase the wait time for patients … Their pathway will not require them to visit a doctor*" *(N1).*

Two managers viewed that primary healthcare centres that have a great number of patients should make use of nursing staff to prescribe medications. This could potentially minimise the length of time that patients must wait for receiving medication prescriptions.

> *"Some primary healthcare centres …. have a great number of patients making daily visits, and such a healthcare centre could have just one or two doctors to every fifteen nurses. If we benefit from a portion of the nurses [having prescribing authority], patient waiting times will be reduced… This is an important point to consider, as if we reduce waiting times, the patients will benefit" (M 3).*

> *"Due to having a great number of patients, sometime patients need to wait longer before getting their prescriptions; we need to have this role [nurse prescribing] … to reduce waiting times in receiving prescriptions in primary healthcare centres" (M 4).*

A limited number of managers, nursing supervisors and nurses perceived that reduced waiting times was seen as leading to improved patient experience and increased patient satisfaction with primary healthcare services.

> "*Patients sometimes complain about delays in receiving their medications, so this may contribute to a reduction in complaints*" *(M5).*

> "*It is not comfortable for patients to wait, and they often complain … If there is a nurse who can provide prescribing service with doctors, that should reduce complaints*" *(NS3).*

> "*By taking on this role [nurse prescribing role], I can ensure that patients will not wait longer to get their medications. This is a good thing for patients, which will work to improve their experience with PHC services*" *(N3).*

4.4.2 Nurse-doctor Partnership Prescribing

This theme discusses how the nurse prescribing role could be implemented as a partnership between nurses and doctors. Additionally, this theme discusses how prescribing in partnership could be implemented in chronic disease clinics and maternity clinics.

The majority of policymakers, managers and nurses believed that nurse prescribing role could begin as a partnership between nurses and doctors. It would be the doctor's responsibility to make the initial diagnosis, and then the nurse could be involved in the development of a treatment plan, in conjunction with the doctor.

> "*I think that only doctors should make the initial diagnosis …. The nurses can be involved in the decision regarding the appropriate treatment options for patients*" *(P4).*

"*The doctor must first diagnose and evaluate a patient's condition, and then work with the nurse to develop a treatment plan that includes the patient's medication*" *(M2).*

"*The most effective way to discuss medications in newly diagnosed cases is with a doctor. After the diagnosis is made by the doctor, we [doctor and nurse] can decide what to do next about medications*" *(N6).*

Two policymakers viewed that a partnership prescribing approach is necessary to begin the integration of prescribing responsibilities into nursing practice within the Saudi healthcare system structure. This necessity arises because medical professionals dominate the direction of health services; implementing independent prescribing would be challenging.

"Doctors are dominant in the patient services... I do not think starting as an independent nurse who can diagnose and prescribe medications would be easy way to begin …. Starting by collaboratively prescribing with doctors [nurse-doctor partnership prescribing], where nurses work with doctors, would be more reasonable..." (P5).

"...The nature of the Kingdom's health system… the health services [being] directed by the doctor, I think starting by prescribing collaboratively with doctors [nurse-doctor partnership prescribing] would be a great starting point" (P1).

The majority of managers, nursing supervisors and nurses agreed that the implementation of the nurse prescribing in partnerships approach would provide nurses with the opportunity to acquire appropriate knowledge and experience in prescribing, which might potentially make it easier for them to prescribe independently in the future.

"Once enough expertise and knowledge are built up through the prescribing of medications working together with a physician …. nurses will be ready to

carry it out on their own [prescribing independently] without assistance from doctors" (M 4).

"They [nurses] can obtain experience by working with doctors. Before they can become autonomous, they need to initially collaborate alongside doctors [partnership prescribing] in order to acquire additional knowledge and experience in prescribing" (NS 2).

"They [nurses] will be able to take on more independence in their prescribing practice if they gain relevant expertise and knowledge from first practising prescribing collaboratively with doctors [partnership prescribing]" (N7).

The majority of policymakers, managers and nurses agreed that chronic disease clinics were the most appropriate clinics for the initial adoption of nurse-doctor prescribing partnerships. This is because patients with chronic diseases will have a clear treatment plan that can be developed by nurse prescribers and doctors in partnership. In such cases, it would be the responsibility of nurses who can prescribe medications to provide follow-up care, assess the progress of such conditions, and prescribe repeat medication.

"*In chronic disease clinics, the nurse and doctor can share the responsibility of managing patients' conditions. Patients' treatment plans can be developed by them [nurse and doctor]. Patients can then be followed up by nurse who can prescribe medications*" *(P5).*

"*For Chronic diseases ... Nurses may need to work with the doctor in developing the patients' treatment plans .... They [nurses] can follow up patients and prescribe medication after each patient has received a diagnosis and treatment plan*" *(M2).*

"*I can prescribe medication for chronic diseases, but I will need to work with doctors to diagnose patients, and then I'll lead the follow-up visits for patients*" *(N10).*

Some policymakers and nurses agreed that nurses should be able to prescribe medications for patients with chronic conditions who are in a stable health condition. However, where a patient's condition may require the adjustment of medication during the course of treatment, a doctors' involvement may be required.

> "*In chronic cases, nurses can prescribe for patients with stable conditions …. For unstable condition they may need to work with a doctor to make changes to the treatment plan*" *(P4).*

> "*It is possible for medications to be prescribed by nurses for chronic disease patients who are not critical, especially those who are stable, but unstable conditions may need to involve a doctor to change the medication or doses*" *(N6).*

> "*When patients' conditions are not stable with the medications in the treatment plan, I need to work with the doctor [partnership prescribing] to see which medication we need to change, or whether we need to increase or decrease the dose*" *(N1).*

However, only two nurses viewed that it would no longer be necessary for doctors to be involved if a patient required a change in their medications or dosage to manage their conditions, as they would be able to make such decisions.

> *"In patients' follow- up, if there's a need to add, change or adjust doses … Doctors don't have to be involved in that, I can handle it myself*" *(N2).*

> *"I would be able to make any necessary adjustments to a patient's treatment when needed, doctors' involvement may not be needed" (N9).*

Some nursing supervisors and nurses perceived that nurse-doctor partnership prescribing could be implemented in maternity clinics. Women who are pregnant should be supported with a clear medication plan, which includes supplements. For

pregnant women in a stable condition who are not at high risk of pregnancy complications, it was felt that nurses could provide follow-up care and prescribe supplements.

> "*It can be implemented in the clinics for pregnant women in health centres because it is mostly vitamins and folic acid. This is very clear, and the treatment plan is clear from the pregnant woman's first visit*" *(NS3).*

> *"In the maternity clinic, nurses can prescribe medications for stable pregnant women based on their treatment plan being known from their first visit, and only including supplements. But I think a serious condition may need a consultant*" *(N3)*.

Only one manager suggested that nurse-doctor partnership prescribing approach could be effectively used with patients who demand routine healthcare services and follow-up care in their homes.

> *"Nurses can prescribe medications for home care patients once the consultant develops an integrated treatment plan for them [patients]. It is possible that the nurse could prescribe medications once the plan is written in advance" (M 3).*

Some managers and nursing supervisors viewed that in cases of respiratory tract infections, where over-the-counter medications are needed to manage simple signs and symptoms such as coughing and fever, nurses were seen as being able to prescribe these medications independently without partnership with doctors.

> "*In cases of a cold, such as known cases of fever and cough, nurses can prescribe independently*" *(M2).*

> "*It is possible in cases of a cold ... nurses can deal with these cold cases and prescribe medications because most of them are OTC [over-the-counter] medications. Simple medications can be prescribed, such as medications for fever, without the need to involve doctors [partnership prescribing]" (NS4).*

"*As an example, in some cases, such as common colds, it is possible for the nurse to prescribe medications independently based on the patient's description of the condition*" *(NS2).*

The majority of policymakers, nursing supervisors and nurses believed that there was no need for nurse-doctor partnership to prescribe OTC medications such as paracetamol to alleviate fever after vaccinating a child in vaccination clinics, as nurses could prescribe it independently.

"*The first clinic where the nurse can prescribe medications is the vaccination clinic, because most children after vaccination need paracetamol … Nurses can provide the vaccination and prescribe paracetamol independently*" *(P4).*

"*In the vaccination clinic… paracetamol is usually prescribed for children after receiving the vaccine. So instead of going to a doctor, a nurse can evaluate the child's condition. If the child is healthy and does not have any problems … they [nurses] give the vaccination and prescribe medication [paracetamol] at the same time*" *(NS1).*

"*Vaccination clinics are also possible because paracetamol would be prescribed after vaccination without need to work with doctor [prescribing partnership]" (N9).*

4.5 Research question 2: What are the facilitators of, and barriers to, the nurse prescribing role in Saudi primary healthcare centres from the perspectives of the macro level (policymakers), meso level (nursing supervisors and managers), and micro level (nurses)?

4.5.1 Educational Preparation

This theme pertains to the necessity of educational preparation in order to introduce the nurse prescribing role. This theme includes three main sub-themes: the need to study pharmacology and diagnosis, determining an educational level, and clarifying entry requirements for nurse prescribing programmes.

4.5.1.1 The need to study pharmacology and diagnosis

The majority of policymakers, nursing supervisors and nurses agreed that studying to gain prescribing competency was the primary facilitator for undertaking a prescribing role. The participants' concern was that prescribing should not be implemented without first undertaking a relevant educational preparation.

> "*Studying... to become qualified in a prescribing role is the number one facilitating way to gain knowledge and skills. I think that nurses are not currently competent in prescribing, as they do not have the knowledge required to prescribe medications. If they [nurses] do not study the prescribing role, they will not be supported in starting this practice*" *(P5).*

> "*This role [prescribing role] is not easy at all, prescribing knowledge and the associated skills for this role cannot be acquired without studying. After completing their studies, then I see that they can prescribe medications, but without study, no …. Study is the only facilitator in this situation to manage the current lack of knowledge*" *(NS4).*

> "*My lack of knowledge at present… I have no knowledge of the field of prescribing medication … I need to study to be competent … but without study, I cannot start the prescribing role*" *(N 5).*

However, one nursing supervisor expressed the opinion that nurses do not need to study to prepare to take up prescribing responsibilities, because they can rely on their long-term experience with respect to re-prescribing medications.

> "*If a nurse has worked in a clinic for more than nine years, she can be considered experienced without study. Nurses know their patients' medications. From my perspective, nurses have sufficient experience to prescribe repeat medications*" *(NS 5).*

Some managers and nurses viewed that nurses should pursue further educational preparation to demonstrate their prescribing competency and ensure that other healthcare professionals do not undervalue their expertise and competency in prescribing roles.

> "*Nurses must study and understand so as not to be underestimated. In other words, doctors may say that you are a nurse, stay on your nursing path only*" *(M5).*

> "*I need to study to be approved so that I can prescribe medications... Doctors might argue that I lack the necessary skills to prescribe medications... Studying to validate my competencies is necessary, so as to be recognised and valued in my new prescribing role" (N9).*

A nursing supervisor and a nurse perceived that undergraduate programmes did not provide adequate preparation for the nurse prescribing role, as they placed most focus upon medication administration and very limited or no focus upon pharmacology.

"*Undergraduate study itself is a barrier owing to the lack of pharmacology. Our study of pharmacology is to only administer medications, but not prescribe medications*" *(NS 1).*

"*During our undergraduate studies, we did not study pharmacology extensively …. We did not delve deeply into it at all so as to learn how to prescribe medications. We learnt how to administrate medications, and because of that it will be difficult for nurses to start prescribing*" *(N1).*

The majority of policymakers, nursing supervisors and nurses agreed that nurses must comprehensively study the families of medications in relation to the various parts of the body and diseases, as well as their mechanisms of action, side effects on the body, interactions between medications, and medication contraindications for specific medical conditions.

"*They [nurses] need to study pharmacology extensively and not at the same level as undergraduates ... They need to study all the medication families as they may deal with patients with multiple diseases …. They need to study the medications associated with body systems and disease*" *(P2).*

"*Learning everything about medications is needed ... The most effective way to take the medications, the interactions between medications, and contradictions in relation to the patient's diseases" (NS2).*

"*I mean comprehensively studying all of the medication's families, side effects and dosages. When a patient has more than one chronic disease, I need to know the medications that are contraindicated in the patient's diseases, the medications that the patient can use, and which medications are appropriate for the patient …. A detailed discussion of medications for different parts of the body and diseases should also be studied*" *(N9).*

However, two nurses viewed that they were only interested in studying medications that were relevant to the areas in which they prescribe medications.

> "*I do not think I need to learn about all medications. I only need to learn more about the medications that I need to prescribe in my clinic*" *(N2).*
>
> "*I am going to work in the chronic disease clinic. I only need to study the medications that prescribe for chronic diseases*" *(N5).*

The majority of policymakers, nursing supervisors and nurses perceived that a lack of diagnostic skills and knowledge among nurses would be the most significant barrier to their readiness to become nurses who can prescribe medications. There is a need for further study in order to gain a better understanding of the diagnosis process, which would include a physical assessment and history-taking skills.

> "*I do not think nurses able to diagnosis patients …. How will the nurse be able to diagnose the patient? They need to learn to do physical assessments along with assessing the patient's medical history to understand the patient's overall health*" *(P5).*
>
> "*In my opinion, if there is something that can prevent the nurses from prescribing medication, is a lack of knowledge about diagnosing and doing a physical assessment …. They need to study and dig deep into the diagnosis*" *(NS2).*
>
> "*The ability to diagnose patients may be challenging for me ... All of these require knowledge and skills in diagnosing, which I am lacking. I need to study how to diagnose the patient from the very beginning. How can I take the patient's medical history to avoid prescribing medications that conflict with their medical condition?*" *(N3).*

A nurse and a nursing supervisor recognised that the reason for their current lack of diagnostic skills and knowledge was insufficient learning during their undergraduate degree. They believed that this lack of focus impacted their ability to have diagnostic skills and knowledge needed to prescribe medications.

> "*Despite studying diagnosis … I would not be qualified to diagnose the patient based on the knowledge I have learnt*" *(N8).*
>
> "*Nursing undergraduate education did not provide nursing students with a strong focus on medical diagnosis*" *(NS1).*

Some policymakers, managers and nurses suggested that it is necessary for nurses to study about diseases in order to diagnose them precisely, understand how they affect the body, and treat and monitor them once they have been diagnosed.

> "*There is a great need for them [nurses] to study more about diseases to be competent enough to diagnose and to provide the necessary treatments*" *(P4).*
>
> "*I think that they [nurses] also need to improve their knowledge about dealing with chronic diseases, such as diabetes, hypertension and heart disease, in order to diagnose or manage diseases*" *(M1).*
>
> "*I cannot interpret symptoms, or understand the underlying pathology of the patient's diseases, or develop an appropriate response. I need to study to enhance my knowledge about various diseases. I'm going to work with, for example, chronic diseases, and so I need to be able to diagnose and define abnormalities during follow-up appointments with their conditions*" *(N5).*

Only two nurses felt that studying clinical laboratory tests was critical to diagnosing patients, prescribing medications, identifying abnormalities and referring patients to other healthcare professionals. These skills form part of the process of evaluating patients' conditions.

> "*If they [nurses] study clinical investigations, they can determine the right medication for the patient and monitor the patient's progress with dosage adjustments*" *(N1).*
>
> "*Understanding normal and abnormal investigations, such as liver function, kidney function, and CBD [complete blood count] …. There are certain*

investigations that indicate a specific problem, such as kidney damage or heart disease. Thus, it is important for the nurse to study the investigations as they assist with diagnosing the disease or the decision to transfer the patient to another clinic" *(N9).*

Two nurses were concerned that nurses may find it difficult to acquire the necessary pharmacological knowledge and skills for the prescribing role, which could pose a significant obstacle during their educational preparation and their journey to become nurses who can prescribe medications.

"*I am afraid that I may not be able to understand medication interactions and the side effects of medications during [my] preparational programme*" *(N1).*

"*[The nurse] might have difficulty understanding [the appropriate] knowledge during her studies. I mean, it is not easy for her to learn, and this can be an obstacle" (N9).*

4.5.1.2 Determining an educational level

Some policymakers, managers and nurses concurred that it is necessary to determine the appropriate level of education acquired by nurses, whether it be through master's degree programmes or additional educational programmes, in order to guarantee that they are qualified, competent, and have the requisite knowledge and skills to prescribe medications effectively.

"*Determining the appropriate educational pathway [level], a degree, or programme for a prescribing role, ... like nurse practitioners in the United States, Canada or nurse prescribers in the United Kingdom*" *(P1).*

"*We do not yet have clear educational preparation in Saudi Arabia to qualify nurses specifically for a prescribing role ... Defining an educational pathway[level] for a prescribing role is needed*" *(M5).*

> "*Educational pathways[level] that prepare nurses effectively with knowledge and skills, as well as ensuring that nurses are competent in this role [nurse prescribing role], need to be determined*" *(N7).*

Some managers, nursing supervisors and nurses viewed that an intensive educational programme focusing on prescribing roles was a suitable educational level that would enable nurses to become qualified to prescribe medications to their patients without requiring a further educational degree. This would be beneficial since nurses only needed to expand their knowledge and skills in prescribing.

> "*In my opinion, an intensive programme covering everything relating to prescribing practice will be sufficient … For example, programme specifically designed for nurses to qualify them to prescribe medications would be helpful*" *(NS4).*

> "*I think a well-defined intensive programme is all they need to qualify them [nurses] with the knowledge and skills they need for this role*" *(M5).*

> "*We have prior knowledge, but we need to develop our skills and knowledge to make the role clearer to us … Intensive programme in prescribing will be the first step towards achieving the qualification*" *(N2).*

Some policymakers, managers and nurses highlighted that an intensive educational programme should combine theoretical knowledge and the practice of prescriptive skills under the direct supervision of a medical professional.

> *"Educational programme should guarantee an effective combination of theoretical knowledge with clinical experiences... medical professionals need to oversee nurses" (P5).*

> "*A two-stage programme would be best. The first stage is theoretical preparation to prepare nurses with knowledge and the second stage is to put this knowledge into practice, supervised by doctors ….*" *(M1).*

> "*I expect to attend an intensive programme that focuses on expanding my theoretical knowledge related to medication and diagnosis. I also expect to practise prescribing under the supervision of a professional who has prior prescribing experience, such as a doctor ….*" *(N6).*

However, a limed number of managers, nursing supervisors and nurses concurred that a master's degree would be a more appropriate educational pathway to allow nurses to become qualified to prescribe medication, rather than an intensive programme.

> "*Taking an intensive programme equivalent to a doctor's job in prescribing? ... I think they must take a certain degree such as a master's degree*" *(M2).*

> "*Opening up areas of higher education, such as a master's degree in prescribing ... would be a very effective approach to qualify nurses for this role*" *(NS3).*

> "*A degree is more important to me than simply taking programme. A master's degree ... I do not feel that an intensive programme will be sufficient*" *(N7).*

Only two nurses suggested that nursing undergraduate degrees should place a higher emphasis on preparing nurses for prescribing medications by intentionally expanding their knowledge about medications and diagnostic skills. This was expected to be an effective educational pathway to prepare nurses to prescribe medications.

> "*Increasing nursing students' knowledge and skills in prescribing would be great educational approach to prepare them to prescribe medications…. I mean developing a curriculum for diagnosis and pharmacology [during their] undergraduate degrees*" *(N1).*

> "*It would be extremely beneficial to study medications and diagnosis in depth during a bachelor's degree programme .... Knowledge and ability to prescribe medications would be enhanced*" *(N8).*

4.5.1.3 Clarifying entry requirements for nurse prescribing programmes

The majority of policymakers, managers and nurses agreed that there was a need for clarification of the level of experience required for nurses to be accepted into the educational preparation that would enable them to become nurses who can prescribe medications.

> "*The requirement for experience needs to be clarified. For example, candidates need 3 years of nursing experience before applying*" *(P5).*
>
> "*The first thing we need to know is what level of experience nurses should have before getting access to education for the role [nurse prescribing role], I think this needs to be clarified" (M5).*
>
> "*Legislators need to clarify what level of experience is required to access prescribing programmes*" *(N10).*

A policymaker, a manager and a nurse suggested that having clinical experience in the area in which a nurse would like to become a nurse with prescribing authority should be part of the entry requirements for enrolling in a prescribing programme.

> "*They [nurses] need to have experience in the area they will prescribe medications in before accessing a prescribing programme as requirement*" *(P3).*
>
> "*…for educational preparation, whether degree or intensive programme, the entry requirement needs to include that the nurses should have experience in the areas they will prescribe in. If they want to prescribe medications in chronic diseases clinics, they need to have, for example, two or five [years] working experience in this clinic" (M1).*
>
> *"Experience in a particular area is an important requirement that needs to be included to access preparational education*" *(N10).*

A limited number of nurses perceived that it was necessary to clarify the entry requirements for prescribing programmes, particularly in relation to the nursing degree that candidates must hold prior to enrolling in such programmes.

> "*Can we start with a bachelor's degree or higher? Is it normal to start with a diploma? Only the ministry [the Ministry of Health] can clarify this*" *(N5).*

> "*For example, a diploma, no, a bachelor's, no, I mean the educational level needs to be clarified*" *(N3).*

Some nurses have suggested that the entry requirements for educational preparation should limit entry to nurse specialists with bachelor's degrees, who tend to be younger nurses who are likely to provide a prescribing service in their clinics for many years as compared to the nurse technicians who are close to retirement.

> "*Entry requirements should be restricted to nurses with bachelor's degree only. Why ...? Many nurses with diplomas are older, and many of them have completed their years of service and are close to retirement, whereas we are looking for practitioners to serve in the long run*" *(N5).*

> "*The programme requirements should be limited to nurse specialists because centres will benefit greatly from them working there for many years*" *(N10).*

However, a nursing supervisor viewed that a nurse technician with a diploma in nursing who aspires to become a nurse with prescribing authority might find it challenging to meet the entry requirements for the program, as they must have a bachelor's degree prior to assuming the role.

> "*The majority are nurse technicians, and the requirement for a bachelor's degree before would be an obstacle. It will be difficult .... They must have a bachelor's degree to earn the title of nurse specialist*" *(NS2).*

However, a policymaker perceived that it would be difficult to restrict the entry requirements for a prescribing role to just nurse specialists as there are fewer nurse specialists than nurse technicians working in primary healthcare centres.

> "*Most of the graduates in the younger generation with a bachelor's degree work in hospitals. Younger generations are very, very few in primary healthcare centres. Even those with a bachelor's degree are present in a lower percentage than those with a diploma and higher diploma. This limitation with respect to the prescribing role for specialist nurses would be challenging*" *(P4).*

4.5.2 The acceptability of the nurse prescribing role

This theme refers to the barriers and facilitators that may influence patients, doctors, and nurses' acceptance of the nurse prescribing role in Saudi primary healthcare centres.

Some policymakers, nursing supervisors and nurses perceived that one of the major barriers to introducing nurse prescribing role into primary healthcare centres would be that patients would not accept it. This is because most patients are not familiar with receiving prescriptions from nurses.

> "*The major obstacle would be from patients, who may not accept it …. Patients are accustomed to receiving medication from doctors rather than from nurses … Currently only a doctor is responsible for prescribing*" *(P4).*

> "*Considering the traditional views and perspectives of society with regard to understanding this role … Some patients may not accept the idea …. Patients may not allow nurses to diagnose or to prescribe medication for them as they are used to doctors doing it*" *(NS3).*

> "*Patients will not accept this role [nurse prescribing role] …. Patients are understanding that prescribing is doctor responsible only" (N3).*

However, a limited number of managers, nursing supervisors and nurses agreed that government organisations and primary healthcare centre administration teams would need to increase patient awareness of the nurse prescribing role so as to enhance patient acceptance.

> "*There must be an understanding within the community before the role is taken on …. Patients need to be made aware through a formal organisation, then they are more likely to accept it*" *(M2).*

> "*We [nursing supervisors] need to make sure that patients are aware in this clinic, integrated care will be provided, including the prescription of the medications for nurses. I believe if they know in advance, they may accept it*" *(NS2).*

> "*Administrators should explain for patients that nurse can also provide prescription in clinic, they may accept nursing role in prescribing" (N5).*

A policymaker, a manager and a nurse raised other concerns about patients' lack of trust in nurses' knowledge and experience as nurses with prescribing authority, which they believed could potentially lead to a lack of acceptance of the nurse's role in prescribing. The participants perceived that patients trusted doctors as the only healthcare professionals to prescribe medications.

> "*The patient's trust in the doctor knowledge and experience in prescribing over a nurse … Patients may not feel confident in their knowledge and experience in prescribing, they may not accept it [nurse prescribing role]*" *(P1).*

> "*I am not expecting the patient to accept it [nurse prescribing role] …. They may not trust nursing knowledge in prescribing…. They [patients] trust doctors' knowledge in prescribing [more as] compared to nurses" (M4).*

"*Our societies place a lot of trust in doctors competent in prescribing ... I mean, they have no confidence in nurses' knowledge than the doctor, so they may not accept the role [nurse prescribing role]*" *(N10).*

However, one manager and one nurse suggested that if the nurse was present with the doctor during the patient's first visit to PHCs, actively participated in developing patient treatment plan, this would enhance the acceptability of the practice by gaining patients' trust and confidence.

"*Nurses need to gain the trust of patients …. Nurses should be present when the doctor examines the patients in their first visits and be familiar with the case beforehand ... sharing the development of a treatment plan …. The service recipients will then feel confident and accept receiving a prescription from nurses*" *(M1).*

"During the initial visit, I need to be with the doctor. We [doctor and nurse] can discuss the patient's condition and develop treatment plan together. In this way, I believe they [patients] will feel more confident and trust in nurses to follow-up [their illnesses] in clinic" (N 5).

However, only two nurses acknowledged that patients are less likely to be resistant to nurses re-prescribing thei*r* medications*,* as these are already known to them.

"The patients who come most frequently to the centre for re-prescribed medications usually say 'Give me my medications'…I mean, these patients are likely to be more accepting since they know their medications" (N 8).

"Sometimes, patients ask me to re-prescribe their medications… I do not think these patients will not accept [nurse prescription] because they have known medications" (N7).

A policymaker, a nursing supervisor and a nurse were of the opinion that patients would accept the nurse prescribing role due to the fact that nursing staff are more approachable and use language that is more patient centred.

> *"I do not think there is a problem with patient acceptance, because the patient needs someone who speak in understandable language and kind, examines him/her well, and gives him/her the appropriate intervention" (P 3).*

> *"Nurses will speak with patients in a dialect and understandable language, making it more likely that the patient will accept the nurse" (NS 2).*

> *"Patients will accept the role [nurse prescribing role], because they will understand more from nurses without misunderstanding. In some cases, the nurse explains to the patient more effectively than the doctor because she speaks to the patient in the vernacular language. It is easier for the patient to understand, particularly the elderly" (N3).*

A limited number of nursing supervisors and nurses were concerned that the lack of acceptance of sharing the prescribing responsibilities between doctors and nurses was viewed as a barrier. This could negatively impact medical professionals in primary healthcare centres, reducing their involvement in patient care.

> "*Lack of sharing prescribing role with nurse by doctor would be a barrier. Doctor roles are limited and simple in primary healthcare centres. If the nurse fulfils the same role and provides the same service ... All of the patients will be handled by three nurses without a doctor, and the doctor will not accept" (NS5).*

> "*Some doctors may oppose the role because they feel that I can fulfil their role functionally and that their role is no longer needed*, *and this would be an obstacle*" *(N7).*

On the other hand, the majority of managers, nursing supervisors and nurses reported that some doctors would accept nurses taking on a prescribing role, particularly as it

would help to alleviate their workload, and allow them to focus on more complicated cases.

> "*The doctors may accept the role because if there is a nurse authorised to prescribe medications on every shift, it will help reduce the burden on the doctors and save their time for more important tasks*" *(M5).*
>
> "*It may be accepted by doctors; this role [nurse prescribing role] may reduce pressure on them and enable them to focus on critical cases*" *(NS3).*
>
> "*If only one doctor is available, he will accept help from nurses who prescribe medications because his work pressure will be alleviated*" *(N8).*

A small number of nursing supervisors and nurses felt that nurses who are confident in their prescribing skills are more likely to be accepted by physicians and patients. Furthermore, it was viewed that resilience is necessary for nurses to efficaciously deal with difficulties in their prescribing role, as resilience allows them to learn from their experiences and persevere in obtaining acceptance.

> *"Nurses must have a strong sense of self-confidence in their prescribing decision .... and they need to be persevering to obtain acceptance from patients and doctors" (NS 2).*
>
> *"A nurse must have certain capabilities to make her role more acceptable to patients and doctors. They need to have confidence in their prescribing decisions ... they need to be learning from the difficulties they face to enhance their role acceptance .... and remain persistent to gain acceptance" (N 9).*

The majority of managers, nursing supervisors and nurses believed that nurses would find it difficult to accept the prescribing role as part of their nursing responsibilities due to the increased workload and responsibilities of this role.

"*Nurses have many responsibilities and extra tasks, and so there is no capacity to increase workload and have additional prescribing responsibility, which would be deemed unacceptable for them" (M2).*

"Most centres require nurses to fulfill both their nursing responsibilities as well as other extra tasks .... Nurses may not accept prescribing responsibilities" (NS5).

"*Having both nursing responsibilities and prescribing medications would be a challenge for me. Adding the responsibility of prescribing medications to a nurse's already heavy workload ... this can be difficult to accept*" *(N2).*

However, the majority of policymakers, managers and nurses thought that financial benefit would be an incentive to accept the additional responsibility associated with the nurse prescribing role.

"*The government must pay for nurses because they will assist doctors' day and night with the prescribing responsibilities*" *(P3).*

"*I think they [nurses] need financial incentives to encourage them to take on this responsibility*" *(M4).*

"*I need financial rewards and to be fairly paid in order to accept prescribing responsibilities and continue to prescribe medications for patients*" *(N5).*

Some managers, nursing supervisors and nurses viewed that adequate nursing staff is vital to increase nurses' acceptance of the prescribing role. Consequently, nurses will have greater flexibility in expanding the scope of their practice.

"... If there are a sufficient number of nursing staff, they may accept the role .... There will be adequate capacity for this role, nurses will be free to conduct their clinics with greater comfort and be able to care for their patients more effectively" (M2).

"... Nurses can have the opportunity to expand their role and delve into patients' needs, including prescribing their medications, if there are enough nurses" (NS1).

" …. an adequate number of nursing staff should be provided to make the prescribing role accepted ... as then they will have a great capacity to expand their practice" (N3).

A nursing supervisor and a nurse viewed that increasing nurses' understanding of their contribution to healthcare services to meet patients' needs and clarifying the nurse prescribing role responsibilities would enhance their acceptability for additional prescribing responsibilities.

"*I believe that they [nurses] should be aware of the role to accept it, for example, the contribution towards patient care and their responsibilities in prescribing, to reduce their concerns over this new practice" (NS2).*

"I need to know what my responsibilities will be after qualifying to become a nurse who can prescribe medications, and the benefits for patients. I think if I know them [responsibilities and benefits], I may accept prescribing role" (N5).

Some managers, nursing supervisors and nurses suggested that individual factors were identified as contributing to nursing professionals' acceptability of the nurse prescribing role, including nurses' willingness to increase their own knowledge, skills, and experience.

"We must also consider that having a strong desire to learn, to know more and to do more than just routine nursing would enhance the role acceptability" (M2).

"As long as nurses are passionate about developing their knowledge and experience, they'll accept it" (NS 2).

"Nurses must have a strong desire to prescribe medications. If nurses have the desire to learn about medications, their actions, and their side effects, then they will accept prescribing responsibilities" (N9).

However, the majority of nurses viewed that prescribing practices would lead to an increased sense of professional autonomy and job satisfaction among nurses. Their professional autonomy and job satisfaction would be enhanced if they were able to prescribe medications. These factors may enhance the acceptability of prescribing responsibilities for nurses.

".... I can prescribe medications .... This will increase my job satisfaction and professional autonomy, and this could be a great factor in enhancing acceptance" (N 9).

"With the ability to prescribe medications to patients, they [nurses] would have a higher level of job satisfaction than they experienced before, which is why I could be motivated to take on these prescribing responsibilities" (N 4).

"I think nurses will accept the prescribing role as it can have great benefits for nursing by increasing their job satisfaction and independence in practice" (N10).

4.6 Research question 3: What potential changes are required to expand the role of the nurse to include prescribing in Saudi primary healthcare centres from the macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses) perspectives?

4.6.1 Establishing the legality of nursing prescribing practice

This theme focuses on the necessary changes to establish the legality of nursing prescribing practice. This theme includes two sub-themes: legislation and regulations and licensed nursing prescribing practice.

4.6.1.1 Legislation and regulations

The majority of managers, nursing supervisors and nurses viewed that the enactment of clear legislation to support the legality of nurse prescribing role in Saudi Arabia as a critical change that would enable the introduction of this practice in primary healthcare centres.

> *"There must be enacted legislations that allow nurses to prescribe medications legally" (M3).*

> *"From a legal perspective, there is a need for clear legislations that give them [nurses] the legal authority to prescribe medications for their patients" (NS5).*

> *"The first step is to have laws [legislation] that make explicit the nurse's authority to prescribe medications" (N10).*

Some policymakers viewed that raising awareness about the nurse prescribing role is necessary. It is the responsibility of nursing professionals to inform stakeholders, including policymakers, about the potential benefits of nurse prescribing practice through formal communication channels. This approach may assist in legalising the nurse prescribing practice in Saudi Arabia.

"*Official appeals should be made to the scientific and professional councils within the health commission, workshops and conferences that discuss both the positives the proposal [nurse prescribing role] .... It's necessary to inform policymakers in the Ministry of Health and other organisations about existing experiences globally and their impact of the practice on the efficiency of healthcare services ... Nurses will have difficulty advocating on this role if they do not use official channels .... they must raise awareness of the need to formalise nurse prescribing practices with clear legislation" (P 1).*

"It is imperative to interact with policymakers in the Ministry of Health formally in order to raise their awareness of global experiences of nurse prescribing and its impact on the quality of health services…. This knowledge is necessary for the development of legislation that would support the implementation of nurse prescribing practices" (P3).

The majority of policymakers, nursing supervisors and nurses perceived that clear legislation made explicit in law would provide a sense of protection for nursing staff who are able to prescribe medications. Implementing this legislation would result in clearer definitions of nurses' roles in prescribing medications to patients.

"When there is clear legislation .... Nurses will be protected by law without fearing to practice their new role in prescribing" (P3).

"…. When there is legislation in place, it serves to protect nurses and it is clear for patients going forward, preventing complaints from occurring" (NS4).

"Nurses need protection and reassurance that legislations .... exist which are clear to their patients. This will allow a nurse to prescribe medication without worry or fear ..." (N1).

A policymaker, a manager and a nurse shared the perspective that there was a need to have regulations to govern the different aspects of nurse prescribing responsibilities.

These regulations included the approach to prescribe medications, the scope of nurse prescribing, limitations associated with medications, and penalty guidelines.

> *" .... The relevant regulatory ministries ... need to develop specific regulations to guide prescribing practice from different aspects, including which prescribing approach to use, what conditions they may prescribe medications for, and penalties if it is breached ..." (P1).*

> *"... Regulations need to be developed based on legislation. These regulations need to rule who nurses can prescribe for, the scope of their prescribing, and the type of medications they can prescribe" (M3).*

> *"We need to have regulations to guide our prescribing practice .... What type of medication and conditions can I prescribe? ...." (N1).*

A limited number of policymakers and mangers claimed that a cooperative initiative amongst regulatory ministries may facilitate the enactment of regulations for nurse prescribing practice in Saudi Arabia. Aligning all the ministries would facilitate the formulation of all the necessary regulations.

> *"... Policymakers at ministerial level, including the Ministry of Education, the Ministry of Health, and Human Resources… these are the great ministries. They must work together to make appropriate regulations" (P3).*

> *"It must have horizontal, integrative approaches. I mean, from the ministries to the Saudi Commission for Health Specialists, there must be horizontal cooperation between the ministries, the Ministry of Education, the Ministry of Health… Cooperation between these ministries will make it easier to introduce the appropriate regulations for nurses to prescribe medications" (M3).*

A policymaker, a nursing supervisor and a nurse viewed that in order to establish appropriate regulations for the nurse prescribing role in Saudi Arabia, regulatory

ministries need to learn from other countries where nurses are authorised to prescribe medications.

> *"We need to do our work and find out from the countries that have implemented nurse prescribing what they had to do to make the right regulation at all levels ... from the clinical level to the administrative level" (P2).*

> *"It is necessary to learn from other countries that have implemented it" (NS2).*

> *"A Ministry of Health may be able to learn from those countries which have nurse prescribers, and this may make it easier to formulate the most appropriate regulations" (N10).*

One nurse suggested that regulatory ministries should conduct a study to explore the opinions of various stakeholders in Saudi Arabia. Gathering such information may aid in the development of appropriate regulations.

> *"Regulatory ministries like the Ministry of Health need to conduct a study to explore the opinions of experienced nurses and doctors about regulating the role [nurse prescribing role]" (N10).*

A small number of policymakers, mangers and nursing supervisors perceived that long-term strategies for implementing the nurse prescribing role should be developed in association with regulations and legislation, with clear goals and objectives, identifying the required actions, expected outcomes and possible challenges. This should be in line with the regulatory ministries' overall objectives.

> *"The development of implementation strategies should be aligned with regulations and legislation .... This helps to ensure that strategies are in line with the regulatory ministries overarching goals" (P5).*

"We need strategies… based on legislation …. Where the people involved will be responsible for them and will know the results they are looking for and the challenges they might face …. It is necessary for this strategy to have clear goals and a long-term vision, as well as implementation plans" (M2).

"Regulations have to be taken into consideration when developing strategies to implement the nurse prescribing role" (NS3).

A manager and a nursing supervisor believed that it was important to develop policies that would guide and govern nurse prescribing practices at the primary healthcare centre level in accordance with legislation and regulations.

"There must be a mechanism and follow-up … I am referring to policies we need at the centre level …. I will not be able to do anything. I need to return them [policies] because the set of policies will govern my actions …. These policies need to be developed with consideration of the regulations and legislation" (M2).

"As we know, any health facility must have policies … Policies are needed to govern prescribing practice and to govern and define the role of leadership …. These policies must be developed based on the regulations for this practice and signed by a regulative ministry [the Ministry of Health]" (NS3).

Additionally, one policymaker and one nurse were of the opinion that it was necessary for experienced nursing professionals to contribute their knowledge and experience to the development of policies that aligned with legislation and regulations.

"Nurses with long experience who work at different levels, including the practice or administrative level, would make a good contribution to developing policies that are subject to legislation and regulations" (P5).

"It will be important to involve nurses with more than 10, 20, or 30 years of experience regarding the development of policies, as they can provide good knowledge, consideration both rules [regulations] and legislation" (N10).

4.6.1.2 Licensed nursing prescribing practice

The majority of policymakers, managers and nurses agreed that only licensed nurses with the required legal authorisation to practice prescribing responsibilities should start in a prescribing role. It was, therefore, emphasised that the licensure process for practicing prescribing legally and its requirements need to be clearly defined.

"A clear definition of the nurse licensing process is needed …. If they [nurses] meet the requirements for licensed prescribing practice …. They are legally able to prescribe medications" (P 1).

"For them [nurses] to practise their speciality [nurse prescribing in their area of competency] … They must obtain licences …. They must meet licensing requirements before starting prescribing practice to legally prescribe medications" (M 4).

"Requirements to obtain licenses need to be defined. Only nurses who meet licensure requirements would be able to prescribe, because they are legally authorised to initiate their prescribing practice" (N 3).

A limited number of policymakers, managers and nurses perceived that a test should be introduced as part of the licensure process to ensure that nurses are knowledgeable and competent in prescribing medications before being legally licensed to practice prescribing.

"A licence test should be designed to assess the applicant and to determine his or her ability to prescribe medications … Before they become legal practitioners in prescribing" (P 1).

"It is better for nurses to have, for example, to pass a test to be licensed legally for this role" (M 1).

"They also need to take a licensing test to assess nurses' readiness to prescribe medications ... By passing the licensing test, they would be registered to practice legally" (N 8).

The majority of managers, nursing supervisors and nurses viewed that upon receiving their license to prescribe, the job title and job description of nurses should change to indicate that they have the legal authority to prescribe medications.

"Licensed nurses .... Need to be titled differently from other nurses to authorise them legally to prescribe medications…. The current job description must change to include the new responsibility of prescribing" (M3).

"There must be a job title .... differentiates them from nurses who are not legally licensed to prescribe medications.... There must be a change in the job description based on the path and scope of prescribing practice" (NS1).

"A new job title must be developed ... for any nurses are legally able to prescribe medications… My job description must change to include the authority to prescribe medications in my practice ..." (N7).

Some policymakers, managers and nurses have suggested that nurses with prescribing authority should periodically renew their licenses in prescribing role in order to guarantee that they remained competent in their prescribing practice. The participants suggested that this could be achieved through continuing education and relevant testing as part of the licensing renewal process.

"There may be a need for the licence to be renewed…. tests may be needed to allow nurses to renew their licence" (P2).

"Periodic prescribing licences may need renewing …. Training must also be conducted through seminars and training courses ... Or they may need to take a test instead" (M3).

"I think we may need to renew our licence in prescribing, we may renew it through a test or maybe through attending courses or training" (N8).

4.6.2 Primary healthcare centres' readiness

This theme describes primary healthcare centres' readiness to implement nurse prescribing roles. This theme contains three sub-themes: changing the PHC infrastructure, supporting the nurse prescribing role, and ensuring safe prescribing practice.

4.6.2.1 Changing PHC infrastructure

Some policymakers, nursing supervisors and nurses believed that having nurse with prescribing authority would not cause a significant change to the way that clinics are delivered and run, since nurses are generally responsible for leading clinics in primary healthcare centres.

"The structure of clinics will not have to change significantly, because the nurse is responsible for three-quarters of the patients' trips to healthcare centres" (P4).

"Currently, nurses are in charge of their clinics, and I don't think the clinic structure needs to change significantly, if they have prescribing authority" (NS2).

"I am leading my clinic and so if I have prescribing authority and prescribe for the same patients then there is no need to have another clinic" (N5).

However, a limited number of nursing supervisors and nurses believed that additional independent clinics may need to be established if primary healthcare centres expect to provide more specialised healthcare services for diabetic patients. This is because primary healthcare centres have comprehensive clinics that deal with all chronic disease patients.

> *"There is currently one comprehensive clinic for all patients with chronic diseases. If we have nurses who have a limited scope of prescribing for only a particular group of patients, for example diabetic patients, then we may need a new clinic" (NS2).*

> *"I am working in chronic disease clinics where patients with chronic diseases such as hypertension, diabetes, renal and heart disease are monitored. Having a specialty scope of practice, such as treating diabetic patients, may necessitate the establishment of a second clinic" (N1).*

Policymakers, nursing supervisors and nurses viewed that it is necessary to change the current patient pathway within primary healthcare organisations, since there would be no need for patients to see a doctor for certain cases.

> *"The patient's pathway could be modified .... If the right to prescribe medications has been given to the nurses, the patient's pathway will be shorter" (P4).*

> *"Patients currently need access to a doctor .... If nurses prescribe medications, they do not need to access a doctor .... Patients' pathways inside PHC need to be changed as they may stop at a nursing clinic" (NS3).*

> *"Have a clear organisational structure; I mean that changing the current patient pathway, as patients have no need to see a doctor" (N10).*

A number of managers, nursing supervisors and nurses shared the perspective that there was a need to modify the information system at PHCs in order to authorise

nurses to provide prescriptions. Additionally, nurses need access to patient records to facilitate managing patients' conditions, alongside other professionals, and providing follow-up care and prescriptions.

> *"It would be better to have an electronic system to link electronic prescriptions. For example, nurses who write prescription must be authorised to log into the system and write prescriptions ... Nurses must see the diagnosis so that they can see the prescription and investigations that have been done, and this is considered to be an electronic link" (M1).*

> *"It is necessary to change electronic systems, such as easy access to computers and giving nurses the authority to write prescriptions ... when they have a comprehensive system that displays the patient's record, and so it should be available at healthcare centres…. Nurses will easily access the patient's medical history shared with other healthcare professionals" (NS1).*

> *"…it is necessary to have access to the system to write the prescription, and to access the patient's record… I can see the patient's treatment plan along with the doctor and follow-up with patients …." (N3).*

Only one manager and one nurse believed that it is critical to integrate a decision support system into the IT infrastructure of primary healthcare facilities to identify possible interactions between medications and patient conditions.

> *"A system that supports their prescribing decisions [is needed], such as a medication programme that alerts nurses to medication interactions so as to ensure that they are providing the right medications and dosages to their patients" (M3).*

> *"…. an electronic monitoring system [decision support system] that monitors my prescribing practice and helps to assess the appropriateness of medications for every case and medication interactions [is needed in the PHC]" (N7).*

Some policymakers, managers and nursing supervisors perceived that leadership responsibility must be modified to facilitate the integration of nursing prescribing into primary healthcare services. The responsibilities of leaders in coordinating the implementation of the nurse prescribing role and monitoring need to be clearly defined.

> *"Leadership roles or responsibilities must be modified .... The leaders of healthcare centres need to have tasks in line with the new direction of nurse practice [nurse prescribing] to coordinate or supervise" (P 1).*

> *"... the current leadership role needs to modify to include responsibilities associated with prescribing role ... It would be unclear how we can lead the role or department would be responsible to facilitate the implementation or supervise with the current leadership structure...." (M 2).*

> *"... Who is responsible for coordinating the implementation process of this new practice [nurse prescribing role] in the PHC? ...Who will be responsible for supervising the nurse's prescribing practice... It may be necessary to modify the supervisor's responsibilities to include the supervision of nurses who have the authority to prescribe medications" (NS 2).*

Two policymakers viewed that piloting the nurse prescribing role is essential for evaluating organisational readiness to implement this role in practice. This might enable primary healthcare clinics to assess their preparation and identify any potential obstacles. Conducting pilots may also help organisations maximise their resources and prepare for effective implementation.

> *"Piloting the role of nurse prescribers may allow healthcare organisations to systematically assess their readiness, identify potential challenges, and make necessary adjustments before a full-scale implementation" (P1).*

"A well-structured pilot programme would provide insights into organisational preparedness for nurse prescribing roles, ensuring that all processes are tested and optimised for a successful rollout" (P5).

4.6.2.2 Supporting the nurse prescribing role

The majority of policymakers, managers and nurses concurred that the provision of administrative support at the centre level can successfully implement nurse prescribing roles. It is more likely that administrative teams will support nurse prescribing within primary healthcare facilities if they recognise the need for nurse prescribing role for primary healthcare services and patients.

"This is completely dependent on the circumstances in which the centre finds itself .... If there is a lack of doctors, for example, the nurse can take the doctor's place, then administrators may support the role" (P5).

"As long as the administrators of healthcare centres recognise that the role is valuable for service, for example, nurses who can prescribe medications can serve the healthcare centres by reducing the workload pressures on doctors and reducing patient waiting times" (M5).

"... I feel that administrators will be happy and supportive, because it will reduce the pressure on the centre .... As a nurse who can prescribe medications, I can prescribe medications on behalf of a doctor for patients" (N7).

The majority of nurses emphasised the importance of administrative support in order to become qualified to prescribe medication. They viewed that it is vital to devote adequate time to educational preparation through an intensive programme or the completion of a degree. This would be challenging without administrative support, which would support them to take study leave.

"It is my responsibility to provide support and guidance to them [nurses] …. My responsibility is to support them in managing difficulties to build up their confidence and competence in prescribing" (NS1).

"There is a need to have support from the administration at the centre, by allowing us to expand our practice and allowing us leave to study" (N6).

"The nursing supervisor must agree that I should go ahead so that there is free time for me to complete the course, or degree …. It is only the nursing supervisor or manager of the centre who can support me" (N7).

Some policymakers, nursing supervisors and nurses felt that nurses with prescribing authority need to receive continuous support from doctors in order to improve their pharmacological knowledge and diagnostic skills. By sharing knowledge through regular meetings, the discussion of difficult cases, and feedback, this can be achieved.

"Doctors may provide support regularly when there is need …. They share their knowledge with nurses and provide them with the information they need … regulate meetings is needed to allow nurses to share their challenges, and discuss how they can overcome them in their future prescribing …. Such support influences nurse competency positively" (P 1).

"Continuous support from doctors is needed not only at the beginning…. knowledge sharing among them can be arranged through regular meetings, this would greatly improve prescribing practice in general" (NS 1).

"Ongoing support from doctors is necessary … If I speak to the doctor, he will provide me with the knowledge I need …. I mean I may share the difficulties I face managing certain cases …. He [doctor] may provide feedback about my prescribing practice … I will surely benefit from his experience and knowledge" (N 6).

Two nurses felt that if they had a positive relationship with doctors before becoming nurses with prescribing authority, the doctors would be more likely to provide support to nurses. It was also emphasised that it is important to retain a good relationship with the doctor.

> *"Based on my experience, I believe the doctor will be supportive. If the doctor and nurse have a positive working relationship before she becomes a nurse with prescribing authority, this will facilitate knowledge sharing. I may consult with doctors about possible side effects associated with the patient's condition. Maintaining a good relationship with the doctors is essential to having a great support" (N9).*

> *"Having a good relationship with your doctor can be very helpful in the long run .... There is a greater chance that he [doctor] will be more willing to support me with his knowledge" (N3).*

A nursing supervisor and a nurse viewed that pharmacists' support is needed. They believe that pharmacists could provide nurses with extensive knowledge about medications.

> *"Nurses can be supported by pharmacists… since they are capable of providing effective and extensive knowledge about medications" (NS 1).*

> *"It's also a good idea to get pharmacists' support .... They know more about medications. I see that they can support nurses by guiding, sharing, and responding to nurses' enquiries about medications" (N4).*

A limited number of policymakers, nursing supervisors and nurses perceived that the administrative teams can effectively contribute to creating a more supportive working environment by enhancing nurses and doctors understanding of professional

boundaries and clarifying their roles and responsibilities. This would reduce ambiguity and improve support between them.

> *"Clarity that nurses now can prescribe medications for doctors is needed … for example, she can prescribe certain medications …. Or for example in chronic disease clinics, nurses can authorise repeat prescriptions for patients …. They also need to know nurses' limitations in prescribing …. We would ensure the working environment would be supportive for nurse if they are known" (P 4).*

> *"I need to let them [doctors] know that nurses can prescribe medications…. I mean their scope of prescribing practice …. Nurses also need to know the doctor's role in prescribing. Hopefully they [doctors] will be more willing to support nurses, we could ensure that the working environment is more supportive to them [nurses]" (NS4).*

> *"If I would be a nurse who can prescribe medications …. a supportive working environment would need to be created for me … How can this occur? … When doctors understand that I can prescribe medications with clear definitions of where I can prescribe, and the medication I can prescribe…We need to know [nurse and doctor] our roles in caring for patients and prescribing for them … We will support each other because our roles will be clear for us" (N 2).*

4.6.2.3 Ensuring safe prescribing practice

The majority of managers, nursing supervisors and nurses perceived that nurses should only prescribe medications within their scope of prescribing practice. This would reduce the possibility of mis-prescribing and thus mitigate risks to patient safety.

> *"They [nurses] must only prescribe within their defined scope of prescribing. For example, nurses in the centre who are responsible for vaccinations cannot*

prescribe medications for chronic illnesses .... We can reduce the risk of medication errors" (M1).

"They [nurses] should prescribe within their scope of practice. I mean, if they are responsible for patients with diabetes, they should not prescribe medications for patients who are not in their areas of competence, and in this way, we manage the risk of mis-prescribing medication" (NS2).

"I won't be working as a general nurse with prescribing authority… For example, I work with pregnant women today and prescribe medications, and next month I could be working with chronic disease patients and prescribing for them. I don't think it's safe for them [patients], and so I must only prescribe in my limited area" (N8).

Certain managers, nursing supervisors and nurses emphasised the importance of pharmacists reviewing and evaluating the prescriptions provided by nurses with prescribing authority to ensure their accuracy and appropriateness.

"It is critical to review prescription records in a more systematic way, so that we can follow the prescriptions. There is no doubt that the pharmacist plays an important role since he/she provides the medications to patients. Pharmacists should take this matter very seriously" (M5).

"Pharmacists can review because this will ensure that the patient is receiving the most effective and safest medications for their condition and reduce the chances of adverse drug interactions or other medical complications resulting from incorrect prescriptions" (NS3).

"Prescribing practice can be reviewed by a pharmacist .... He can help to reduce the risk of medication errors" (N4).

A policymaker, a manager and a nursing supervisor recognised that the monitoring of clinic performance indicators related to patient outcomes is essential for identifying

any issues that may pose a threat to the patient's health and need to be resolved and monitored.

> *"Patients' outcomes are also a good indicator of the safety of prescribing practice .... We can assess whether the nurse's role is being performed appropriately or not, whether the medications she prescribed are correct or not .... When we know the reason for the problem, we can fix it .... We can manage it, stop it from happening again, and maintain monitoring for enhanced performance*" *(P 4).*

> *"The safety teams are a helpful way to ensure the safety of prescribing .... Prescribing safety can be monitored by the safety teams in accordance with the basic standards of quality .... Safety teams will follow up on the entire work based on indicators ... If there are any defects in prescribing practice, they will make solutions to how we can manage them in future" (M 2).*

> *"Clinics must have performance indicators, monitoring clinic performance indicators related to patient response, side effects, complications... If there are deficiencies in practice, I will develop a plan for correcting them ... I will monitor the progress" (NS 3).*

One manager suggested that regular monitoring of nurses' management of patient cases is needed. This would ensure that nurses are following appropriate guidelines for the patient's condition, which minimises the risk of unnecessary harm to patients.

> *"Monitor the nurses' practice of managing cases, for example, referring diabetic patients to nutrition clinics if the patient's haemoglobin glucose (cumulative sugar) is high. The purpose of this is to determine whether the nurse who prescribes medications is familiar with certain and suitable guidelines for patients and to ensure that avoidable risks do not happen" (M3).*

The majority of policymakers, nursing supervisors and nurses highlighted that nurses who can prescribe medications should actively take part in continuous professional

development activities to remain up to date with treatment guidelines relevant to their areas of practice. This would ensure the safety of their prescribing practices.

> *"They will become responsible for their continuing education and professional development. Continuing education involves attending courses about medications within the scope of health centres, and keeping up to date on all of them is needed to maintain safe prescribing practice" (P 4).*

> *"To ensure nurses prescribe safely, they need to maintain the skills they have acquired and constantly be aware of what is new by attending training courses" (NS 1).*

> *"Nurses must stay up-to-date using training courses, and must regularly up update their knowledge and skills related to the areas they prescribe in .... continuous professional development would help them to adhere to safe prescribing practice" (N 2).*

A number of managers, nursing supervisors and nurses claimed that retraining and requalifying in prescribing practice could be used as a means of managing persistent mal-prescriptions that may threaten patients' conditions and safety.

> *"In the beginning, there may be mistakes, two or three times, but with consistency, nurses may need to retrain to develop their skills and knowledge because patients' health is at risk" (M4).*

> "*Requalifying nurse, if necessary, where any problems threatening patient safety arise with their prescribing practice*" (NS4).

> *"If I prescribe medications wrongly, for example for patients with chronic diseases, I'll need a relevant programme or course that may help me to expand my knowledge to avoid such mistakes in my prescribing" (N4).*

The majority of managers and nursing supervisors believed that the quality and safety of nurse prescribing role are contingent upon the inclusion of the voice of the patient.

Patient feedback through questionnaires would provide insights into their experiences and satisfaction, instead of solely relying on objective measures of the quality and safety of nurse prescribing practices.

> *"…We have this in Saudi Arabia, they call it the voice of the patient. I mean, instead of the healthcare centre manager working alone in monitoring quality and safety, patients would complete a questionnaire and evaluate the healthcare professional who provided the prescription" (M 1).*

> *"It is also necessary that prescribing practice is evaluated by patients because if the patients evaluate the service provided to them, I will know better whether the nurse is qualified to have this authority…This will help us to know if nurses prescribe medications safely" (NS 4).*

4.7 Summary

This chapter outlined the findings arising from the qualitative data gathered for this study. It provided a demographic overview of the participants who took part in the interviews, as well as a detailed discussion of the significant themes and subthemes identified via reflexive thematic analysis of the interview data. A total of six themes emerged from the data to address the three research questions. Each theme was organised under the corresponding research question and supported by quotes from participants.

The main findings revealed that implementing a nurse prescribing role would help improve the primary healthcare service, as this role will improve accessibility to medication and reduce waiting time. The nurse prescribing role can be implemented in partnership between nurses and doctors. This prescribing approach can be affected in managing chronic conditions in primary healthcare centres. However, a lack of pharmacological knowledge is a current barrier that necessitates educational

preparation. The current study's findings suggested various educational approaches, such as master's degrees and an intensive prescribing programme that focuses on developing prescribing knowledge and skills. The acceptance of the nurse prescribing role among patients, medical professionals, and nurses is a key facilitator. The lack of acceptancy among nurses and other relevant stakeholders also emerged as a potential barrier. Lastly, the implementation of the nurse prescribing role requires critical changes, such as establishing its legality and ensuring primary healthcare centers are ready.

In the next chapter, these findings are discussed alongside relevant national and international literature to provide a context for the study's contributions to existing Saudi literature on the integration of the nurse prescribing role into primary healthcare centres services. The next chapter also discusses the study's strengths and limitations and provides a conclusion along with recommendations for policymakers, education, practice, and future research.

Chapter 5: Discussion

5.0 Introduction

This chapter commences by discussing the interpretation of study findings through the lens of institutional theory. It also evaluates the effectiveness of the methodology, method, and provides reflections on the use of the theoretical framework in the current study. The key findings of this study are discussed in this chapter under their respective theme headings with reference to the existing literature. Each theme is presented in turn under the research question it addresses. Moreover, this chapter illuminates the significant contribution that this study brings to the Saudi literature in filling the existing knowledge gaps. The chapter also delves into the study's strengths and limitations, provides recommendations for future research, policymakers, education, and practice, and draws overall conclusions.

5.1 Interpretation of study findings

This section discusses the interpretation of the study's findings through the lens of institutional pressures, expanding upon the previous discussion in section 3.4.2.5.2 in chapter three.

The findings revealed that the nurse prescribing role has the potential to significantly improve access to PHC services. This perspective exemplifies the impact of the existing normative pressure on the Saudi healthcare system, as participants recognise the critical nature of enhancing patient access to their medications. This acknowledgement generates a mutual expectation that the implementation of the nurse prescribing role is required to meet the current fundamental demand for healthcare services. In addition, increasing demand for PHCs services offers justification for nurse prescribing roles as an effective approach to alleviating the difficulties

associated with medication accessibility. This is in line with institutional theory, which proposes that changes in the practices of institutions can lead to better organisational outcomes (Tolbert et al., 1999). Interpreting these findings through the lens of institutional pressures reveals that the normative expectations surrounding the nurse prescribing role significantly shape the discussion and participant perceptions on its integration. These normative expectations emerged from the necessity of improving patients access to primary healthcare services and addressing their needs more effectively.

The findings further indicate that the implementation of the nurse prescribing role should be achieved in partnership with physicians, as nurses still rely on doctors for medical diagnoses. This interdependence highlights the influence of current normative perspectives within the culture of Saudi PHCs, which prioritise nursing professionals' reliance on medical professionals, reflected in the necessity of partnership prescribing with physicians. According to institutional theory, collaboration is essential, as collaborative practice can facilitate the adoption of new roles by integrating them within pre-existing frameworks and norms (Lawrence et al., 2002). This normative perspective is further shaped by current professional standards and expectations, which influence participants' views on nurse prescribing approach and reinforcing their conviction that partnership prescribing with physicians is required for the provision of effective patient care.

The current normative culture of PHCs is based on an approach in which physicians dominate clinical decision-making on patients' treatment. The participants thus see shared authority for prescribing as more appropriate within this cultural framework. In institutional theory, normative legitimacy contributes to the social construction of

reality, in which shared values influence the perception of appropriate or acceptable behaviours (Hoefer, 2022). Therefore, the current normative standards within the culture of PHCs reinforce the concept that nurses should prioritise prescribing through partnerships with medical professionals rather than engaging in independent prescribing.

Overall, the interpretation of these findings through the lens of institutional pressure illustrates the extent to which the current normative perspective and professional culture within PHCs influence the perceptions of nursing professionals and other participant groups regarding the most appropriate and acceptable nurse prescribing approach for the Saudi healthcare system.

Institutional theory highlights the need for cognitive institutional credibility, which denotes a shared understanding of what is appropriate within the wide institutional context (Suchman, 1995). Institutions must always align their goals with wider cultural norms, such as education and training, in order to establish credibility within a community (Scott, 2014). The findings revealed that one current normative barrier within the nursing profession is nurses' lack of pharmacological knowledge, highlighting the need for nurses to develop adequate knowledge, skills and build competency in the prescribing roles. Such views drive the belief that educational preparation is essential to adhere to the professional standards required in nurse prescribing roles. The recognition of educational preparation as vital stems from this normative barrier, reinforcing the idea that it is crucial for nurses to achieve professional competence and credibility in their prescribing role.The attitudes and behaviours of medical professionals and other healthcare providers also contribute to this normative influence, as the findings emphasised the significance of

pharmacological knowledge and educational preparation in enhancing the credibility of nursing professions in prescribing roles; this solidifies the belief that educational preparation is necessary for nurses to obtain and maintain professional competence and credibility.

Additionally, the findings also indicated an expectation among participants that nurses would need to continuously update their knowledge and skills, particularly with regard to pharmacology and medication guidelines. This expectation further reinforces the belief that continuing professional development is essential to meet professional standards. The shared commitment among healthcare professionals to promoting patient safety similarly emphasises the need for continuous education to guarantee safe prescribing practices, reflecting a normative commitment to developing excellent and safe healthcare services.

The interpretation of these findings through the lens of institutional pressures reveals how normative barriers and pressure shape the perceptions and attitudes of nurses and other participants towards the nurse prescribing role. This highlights the critical importance of educational preparation in developing prescribing competency and the application of CPD to enhance patient safety and care quality.

Institutional theory also claims that strongly established presumptions and embedded ideas, often known as institutional logics, can create obstacles to the process of organisational transformation (Scott, 2008). The findings indicate a collective normative expectation among the participants suggests that the acceptance of nurses and other stakeholders, including patients and medical professionals, is required for the nurse prescribing role to succeed. These social norms significantly influence how individuals might perceive the nurse prescribing role and its legitimacy within the

healthcare system. The nursing profession has already established normative standards and expectations regarding collaboration, interprofessional relationships, and lack of prescribing authority. However, when these established normative standards changed to allow nurses to prescribe medications, a lack of acceptance among patients (service users) may emerge, potentially acting as a barrier to the effective implementation of nurse prescribing practice. This indicates that the current normative pressures greatly influence patients' trust and confidence in nursing professions. Patients may be reluctant to accept the legitimacy of nurses prescribing roles, as the current norms (normative pressure) do not positively support their recognition as competent prescribers. Such scepticism may be caused by societal expectations, in particular those that have traditionally positioned physicians as both the primary and the only competent decision-makers regarding prescribing medications. In addition, the current social norms (normative pressure) support the restriction of prescribing authority to physicians. However, this suggests that the acceptance of the nurse prescribing role depends on the attitudes of other medical professionals. This role might be acceptable when medical professionals share positive normative acceptance, whereas a lack of acceptance may reinforce resistance to it. The findings also highlight the importance of enhancing normative awareness among patients and other stakeholders to help overcome barriers to acceptance. This reflects the need for a normative facilitator to educate all parties about the nurse prescribing role and its benefits, thus promoting a climate conducive to acceptance.

The interpretation of these findings through the lens of institutional pressures thereby illustrates how collective normative expectations and the professional culture within PHCs both influence acceptance and legitimacy of the nurse prescribing role,

highlighting the need for more education and awareness to facilitate its integration into practice.

The findings suggest that establishing the legality of the nurse prescribing role is essential, highlighting the need for clear legislation and regulation at the national level. According to institutional theory, regulatory powers are crucial for legitimising and integrating new practices within institutions (Scott, 2014). These findings indicate that formal acknowledgement from institutional authorities is necessary to legitimise nurse prescribing authority; in the absence of explicit coercive legislation, nurses may experience fear and ambiguity regarding their scope of practice, potentially leading to reluctance to prescribe medications. These findings exemplify coercive institutional changes, emphasising the necessity of legislation and regulations being set by governing authorities to create a solid legal foundation for the nurse prescribing role; such legal clarity is vital for the successful implementation of this practice.

Additionally, the findings highlighted the significance of incorporating insights from countries that have successfully implemented nurse prescribing responsibilities. These perspectives shape the belief that adopting proven practices that align with professional standards and societal expectations is necessary. These findings reflect mimetic changes, indicating a collective expectation within the nursing profession that best practices will be adopted from successful models abroad. These mimetic changes suggest that the effective integration of nurse prescribing requires not only compliance with existing regulations but also changes in local policies that mirror successful international strategies in the nurse prescribing role.

Based on current findings, only licensed nurses who meet specific requirements should be authorised to prescribe medications. Adopting a licensure process is thus

seen as essential to ensuring that nurses are equipped with the necessary knowledge and competency to effectively initiate the prescribing practice. This reflects a recognition that external authorities and government bodies will impose requirements that must be met both for the nurse prescribing role to be legalised and to allow nurse to practice prescribing safely. These findings further illustrate the significant influence of regulatory bodies in enforcing compliance with best prescribing practice standards as a form of coercive pressure.

The interpretation findings through the lens of institutional pressures highlight the interplay of coercive change, stemming from regulatory requirements, and mimetic change, driven by the desire to learn and adopt effective practices from other countries. This dual influence can be seen as essential for the successful implementation and integration of the nurse prescribing role within healthcare systems.

The findings further indicate that organisational readiness is essential for the successful implementation of nurse prescribing, implying that sufficient resources such as infrastructure, support systems, and mechanisms for safe prescribing must be put in place prior to the commencement of this role. These findings convey concerns that without these resources, organisations will struggle to comply with regulatory requirements, reflecting coercive pressure. This highlights the necessity for organisations to meet external mandates in order to effectively integrate nurse prescribing into their existing practices. Institutional theory emphasises the crucial role that the organisational level plays in the process of institutional change (Lawrence et al., 2002). The need for changes to the current infrastructure illustrates normative change, influenced by coercive pressure from legislators and policymakers.

The participants conveyed a collective expectation that organisations would have to adapt to incorporate the nurse prescribing role, aligning themselves with evolving professional norms that recognise the importance of an appropriate infrastructure for effective prescribing practice implementation.

The need for support at the organisational level further emphasises the nature of normative change. The participants perceived that organisations should promote an environment conducive to nurses gaining support from other medical professionals. This reflects professional norms that prioritise ongoing support for growing nurse competence in prescribing practices. Additionally, the focus on ensuring safe prescribing practices offered a clear indication of the normative changes required to integrate the nurse prescribing role. This highlighted a shared commitment to patient safety and quality of care within the organisation, reinforcing the professional standards that guide nursing practices. The findings thus highlight an interplay between coercive and normative changes that is essential for the successful integration of nurse prescribing into healthcare practices.

The study findings thus highlighted the significant influence of coercive, normative, and mimetic pressures on the implementation of the nurse prescribing role. Coercive pressures arise from the need for clear legislation and regulations, which should form a legal framework necessary in support of the nurse prescribing role. The findings emphasised the importance of developing relevant regulations, which may require incorporating insights from countries that have already successfully implemented the nurse prescribing role. Mimetic pressures can thus play a significant role in shaping the implementation process of the nurse prescribing role, as learning from the successful integration of nurse prescribing in other countries may provide valuable

insights into the development of appropriate regulations and policies, which can be tailored to the local context in Saudi Arabia. These international examples should therefore serve as standards to inform the foundation of effective frameworks for nurse prescribing, promoting a sense of validity around its adoption. The healthcare system in Saudi Arabia should thereby be able to enhance the effectiveness of its implementation efforts by recognising positive outcomes associated with the nurse prescribing role, such as operational efficiencies.

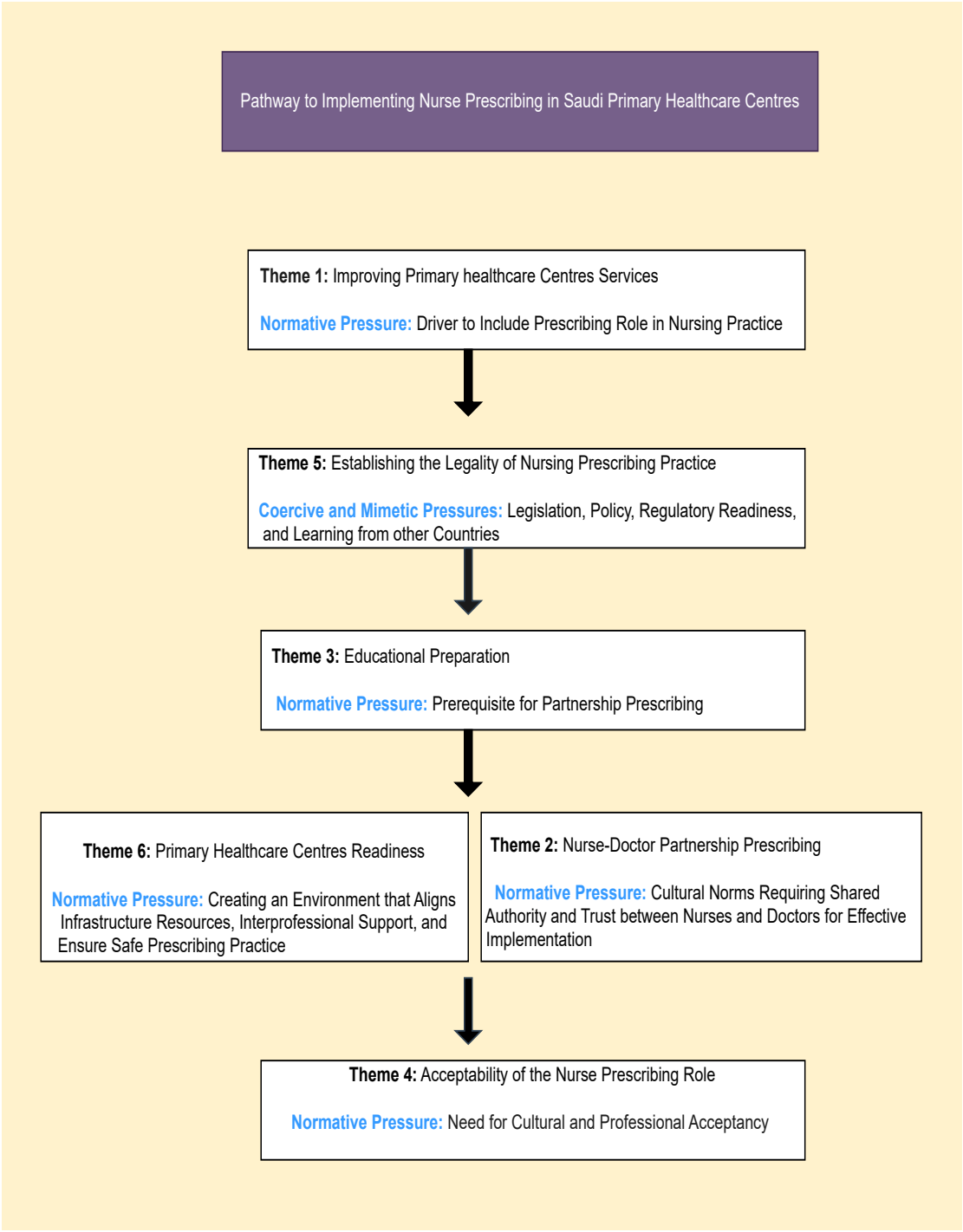
Legislative mandates require compliance from healthcare organisations, with the later then establishing organisational structures for the implementation of nurse prescribing in practice. The effectiveness of these coercive pressures thus depends on the normative context (normative pressure) within these healthcare organisations. However, the adoption of the prescribing role as a core competence through educational preparation within the nursing profession should help to manage current normative barriers exerted on the nursing profession due to a lack of knowledge and prescribing abilities. This normative barrier can thus be managed, with the aim of promoting an environment in which compliance with coercive regulations occurs.

It is clear that the interplay of various pressures creates a conducive environment for the implementation of the nurse prescribing role in Saudi Arabia's PHCs. Coercive pressures, such as regulatory demands, can facilitate the successful implementation of the role. Mimetic pressure could also lead to the healthcare system learning from comparable institutions abroad that have already implemented the nurse prescribing role, thereby facilitating the relevance of coercive measures that enhance normative recognition of nurse prescribing roles.The successful implementation of the nurse prescribing role depends on the interaction of coercive, normative, and mimetic

pressures. However, this highlights the need for a coordinated approach that meets legislative mandates, promotes educational preparation, and fosters cultural acceptance, within the healthcare system. Coercive and normative pressures can thus work together to influence organisational readiness, each contributing to the effective implementation of new practices.

The diagram below illustrates the pathway to implementing nurse prescribing in Saudi primary healthcare centres, shaped by emerging themes from the study's data which are influenced by three key pressures: normative, coercive, and mimetic pressures. Theme 1: improving primary healthcare centres services is driven by normative pressure, emphasising the need to enhance PHCs services which can act as a driver. Theme 5: establishing the legality of nursing prescribing practice reflects coercive and mimetic pressures, focusing on legislation, policies, regulatory readiness, and learning from other countries to support the implementation. Theme 3: educational preparation, influenced by normative pressure, highlights the importance of equipping nurses with the skills needed for partnership prescribing. Theme 6: primary healthcare centres readiness addresses normative pressure, requiring aligned infrastructure, interprofessional support, and resources for safe prescribing. Theme 2: nurse-doctor partnership prescribing relies on normative pressure, promoting trust and shared authority between nurses and doctors. Theme 4: acceptability of the nurse prescribing role, shaped by normative pressure, highlights the need for cultural and professional acceptance for sustainable implementation. Together, these themes provide a structured pathway for implementing nurse prescribing, demonstrating the influence of external and internal pressures on the process , as illustrated in Figure 10.

Figure 10 : Pathway to implementing partnership nurse doctor prescribing in Saudi Healthcare system.



5.2 Effectiveness of the Methodology and Method

The exploratory descriptive qualitative methodology proved to be particularly effective in exploring perspectives related to the nurse prescribing role, given its lack of implementation in Saudi Arabia. The use of qualitative approaches is advantageous for exploring detailed social phenomena in their contexts (Creswell et al., 2018). By using this methodology, which enabled in-depth exploration, the current study successfully identified significant factors not previously explored in the Saudi literature that influence the implementation, legitimacy, and adoption of the nurse prescribing role in primary healthcare centres. The participants provided an insight into the obstacles they expected to face. They also identified supportive factors and needed changes pertinent to the Saudi healthcare system context. The effectiveness of this methodology also stems from its ability to describe the findings in a way that accurately reflects the participants' perceptions. Therefore, in the current study, the researcher successfully explored and described the study's findings by using this methodology, thereby contributing to the successful integration of this innovative practice in PHCs.

Qualitative research methodologies provide the flexibility to adapt appropriate data gathering methods to meet the research objectives (Busetto et al., 2020). The researcher employed semi-structured interviews with open-ended questions to delve deeper into the participants' perspectives. Patton (2015) emphasises that semi-structured interviews are especially advantageous for thoroughly examining participants' viewpoints. Semi-structured interviews (open-ended questions) were more effective in uncovering the various factors affecting the readiness to integrate the nurse prescribing role into Saudi PHCs. This data gathering method facilitated meaningful interactions with the participants, enabling them to effectively convey

their perspectives without the limitations of predetermined responses to choices. In addition, this method of data gathering strengthened the study's findings, acknowledged the perspectives of nurses and stakeholders, and promoted an in-depth understanding of the various aspects influencing the integration of nurse prescribing in PHCs.

The current study used a combination of purposive and snowball sampling strategies. Purposive sampling enabled the researcher to effectively select individuals capable of providing broad insights relevant to the study aims. This purposive sampling strategy ensured that the chosen participants had the relevant perspectives necessary for collecting significant data. The utilisation of a snowball sampling strategy helped to increase the sample size. This strategy permitted the current participants to refer others within their networks, enabling access to a wider variety of perspectives and enhancing the richness of the collected data.

5.3 Reflections on the use of the theoretical framework

Institutional theory informed the data collection and the interpretation of the study's findings (please see Chapter 3). Institutional theory informed the development of the interview schedule (prompts), aiming to explore the participants' perceptions of the potential integration of the nurse prescribing role, with a focus on its isomorphism pressures. The theory was also effective in adjusting the prompts to align with the expected and pertinent perspective of implementing the nurse prescribing role in the Saudi healthcare system. The theory supports the triangulation of perspectives across multiple levels within an integrated structure (Thornton et al., 2012). The current study achieved the triangulation of the participants' perspectives across the three levels, which was the primary objective of validating the study findings.

The use of institutional theory as the theoretical framework made a significant contribution to the current study by providing a systematic and structured perspective through which to explore the complex institutional factors influencing readiness to adopt a nurse prescribing role within Saudi PHCs. Due to its grounding in institutional theory's three isomorphic dimensions (coercive, mimetic, and normative), the framework enabled the researcher to develop interview questions (prompts) that more effectively captured the various institutional pressures operating at different levels across the Saudi healthcare system. On integrating coercive, mimetic, and normative institutional pressures into the development of the interview questions (prompts), the study's theoretical framework provided a robust foundation for probing the influence of governmental health policies, professional norms, and organisational uncertainties on the inclusion of nurse prescribing in nursing practices. Furthermore, the use of institutional theory as the study's theoretical framework made a significant contribution to the triangulation of data from three distinct participant levels. This approach not only made it possible to generate thematic insights across the entire dataset, but it also contributed to the development of a deep and valid understanding of the ways in which institutional factors different levels come together to influence the readiness to include prescribing roles in nursing practice in Saudi PHCs.

Although the theory did not directly guide the coding and categorisation of data in the present study, it enabled an insightful interpretation of the study's findings. Reflexive thematic analysis (RTA) was used independently, and the findings were interpreted through the lens of institutional theory of coercive, mimetic, and normative pressures. The theory enabled the researcher to effectively interpret the study findings by illustrating institutional pressures, thus clarifying how the findings reflect current norms and expectations regarding the implementation of the nurse prescribing role.

This also provided an illustration of how institutional pressures interact to effectively integrate the prescribing role into nursing practice within Saudi Arabia's existing healthcare system. In general, the interpretation of the study's findings through the lens of institutional theory effectively highlighted many current institutional pressures and how they interact, which may influence the implementation of the nurse prescribing role in Saudi primary healthcare centres.

However, the limitations of institutional theory hinder its effectiveness in the current study. The theory provides a useful lens for interpreting findings, but it emphasises institutional factors (pressures) rather than acknowledges the critical role of human agency. Institutional theory also often neglects the ways in which individuals engage in their institutional embeddedness or make intentional efforts to promote change (Lawrence et al., 2011). This limitation was evident in the study's findings, especially for those who shared their views regarding the need for educational preparation. The theory emphasis on institutional logics may also have unintentionally minimised the capacity for revolutionary action by individual nurses and other stakeholders.

5.4 Research Question 1: What are the perspectives at the macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses) regarding the introduction of the role of nurse prescribing to Saudi Arabian primary healthcare centres?

5.4.1 Theme 1: Improving primary healthcare services

Participants from the macro, meso, and micro levels widely perceived that the implementation of nurse prescribing responsibilities in primary healthcare centres would enhance primary healthcare services by improving accessibility and reducing waiting times. Alhamed et al. (2023) conducted a qualitative study to explore the

perspectives of nurse leaders from various clinical settings on the implementation of advanced practice nursing. Although the primary aim of that study was not to explore readiness to include a prescribing role in nursing practice, its findings supported those of this current study. Alhamed et al.'s (2023) study revealed that the participants perceived advancing nursing practice as having the potential to effectively contribute to the improvement of healthcare services through the facilitation of access to medications and the reduction of waiting times, with efficient contributions to meeting patients' needs. Both studies' participants acknowledged the potential benefits of expanding the scope of nursing practice within the Saudi healthcare system. Although Alhamed et al. (2023) made an effective contribution by investigating perspectives of adopting advanced nursing practice, they failed to identify specific settings or roles that this might affect. The current study, in contrast, focused more narrowly on expanding nurse practice to incorporate prescribing medications within Saudi PHCs. The current study's findings provide a more detailed understanding of the potential advantages linked to the integration of prescribing responsibilities into nursing practice within the context of primary healthcare services, thus complementing the findings of Alhamed et al. (2023).

Participants across different levels concurred that the current scarcity of physicians in Saudi PHCs, particularly in rural and remote areas, is having a severe effect on patients' accessibility to healthcare services and medications. This deficit often results in substantial problems with the accessibility of medications. As a potential solution to this related difficulty, many participants suggested enabling nurses to prescribe medications in PHCs, which would enhance access to medications in these areas. Banaser et al. (2021) also carried out a qualitative study that investigated the perspectives of nurses on the need for advanced nurse practice in Saudi public

hospitals. Although the emphasis of Banaser et al.'s (2021) study was different from that of the present study, its findings were comparable. Banaser et al. (2021) similarly reported that the provision of diagnostic, prescribing, and assessment capabilities for nurses could significantly contribute to addressing healthcare inequality in primary healthcare services in Saudi Arabia, especially in underserved regions where the number of doctors is inadequate. The findings of both studies emphasise the importance of considering all the potential possibilities for utilising the skills and knowledge of diverse healthcare professionals in order to reduce discrepancies in access to primary healthcare services, particularly in terms of increasing accessibility in underserved regions. However, there was a significant difference between the current study and Banaser et al.'s (2021) study in terms of the participants involved. While the primary focus of Banaser et al. (2021) was nurses working in hospital settings, this study focused on the perspectives of nurses working in PHCs, thus making a substantial contribution to the enhancement of knowledge about the current situation within these facilities. Furthermore, including other relevant stakeholders, managers, and nursing supervisors (meso-level) working in PHCs who have an in-depth understanding of the current situation in these centres, they are more likely to capitalise on and provide valuable insights into the potential benefits to their patients of expanding nursing practice to include prescribing roles.

The findings of this current study also align with those of Coull et al. (2013) and Wilkinson et al. (2015). Wilkinson et al. (2015) discovered that the shortage of physicians, particularly in rural regions, has led to limited access to healthcare services in New Zealand. Registered nurse participants emphasised the need for nurse prescribing practices to improve access to medications in such areas. Coull et al.'s (2013) study, conducted in the UK, demonstrated the tangible benefits of nurse

prescribing roles in improving patient access to medications, particularly in remote and rural areas. Their findings indicated that incorporating nurse prescribers into healthcare services positively impacted access to medications when general practitioners (GPs) are unavailable. This suggests that implementing nurse prescribing responsibilities is an effective strategy for addressing significant healthcare access challenges, especially in rural and remote regions.

5.4.1.1 Summary

The introduction of nurse prescribing roles into PHCs in Saudi Arabia could bring in benefits in terms of increasing access to medication and reducing waiting times. It is important to improve access to medication in rural and distant locations, as these are currently experiencing substantial difficulties due to a lack of medical professionals. Overall, the role of nurse prescribing is viewed positively, based on the perceived value it has in terms of enhancing the quality of healthcare services.

5.4.2 Theme 2: Nurse-doctor Partnership Prescribing

Participants in this current study, representing the macro, meso, and micro levels, viewed nurse-doctor partnership prescribing within primary healthcare services as the most effective way to introduce the role of the nurse. Nurses would work closely with doctors in order to establish treatment plans for patients, with the responsibility for conducting diagnosis generally considered to be the doctors' responsibility; nurses could follow-up with patients, monitoring their conditions and providing repeat prescriptions. Almotairy et al. (2023) conducted the first quantitative study aimed to explore nurses' readiness to prescribe medications under supervision. The data were gathered through a cross-sectional survey that included 379 nurses from a variety of areas and settings in Saudi Arabia. The results of Almotairy et al.'s (2023) study

indicated that nurses preferred to assume prescribing authority under relatively close supervision. In contrast, this study focused on gathering the perspectives of nurses working in primary healthcare centres along with other participant groups to explore their perspectives on feasible and potential nurse prescribing approaches. The findings of the current study, which are qualitative in nature, thus provide a contribution to the existing body of knowledge; they provide a novel perspective on the strong support for nurse-doctor partnership prescribing, particularly within the context of PHCs. This finding further builds upon the existing understanding of prescribing under supervision previously laid out by Almotairy et al. (2023). This study also presents novel knowledge about the feasibility and relevance of prescribing partnerships between nurses and doctors, particularly within PHCs. The concept of partnership prescribing between nurses and doctors also aligns with the supplementary prescribing approach, a form of nurse prescribing introduced early on in the UK (see Chapter 1).

The participants from different groups (macro, meso and micro levels) in this current study supposed that chronic disease clinics in PHCs were the most suitable settings for the initial adoption of nurse-doctor partnership prescribing, due to the fact that patients who are suffering from chronic diseases need clear treatment plans that can be established through nurses who can prescribe medications and doctors working in partnership. The participants suggested that in such cases, nurses with prescribing authority could assume the responsibilities of providing follow-up care, monitoring the progression of patients' conditions, and issuing repeat prescriptions. These findings are similar to those reported in studies conducted in the UK and Poland. In an early quantitative study carried out by Carey et al. (2007), 214 supplementary nurse prescribers completed a written questionnaire in the UK. The results revealed that

supplementary nurse prescribers were able to effectively prescribe medication in partnership for various chronic conditions, including diabetes, hypertension, and cardiovascular diseases. Zimmermann et al. (2020) conducted a recent quantitative study in Poland, which demonstrated the effective use of the supplementary nurse prescribing approach for managing and prescribing medication for several chronic illnesses, such as hypertension, diabetes, and cardiovascular conditions. These results provide evidence for the feasibility of the nurse-doctor partnership prescribing discussed in the current study, particularly as an effective approach for managing chronic conditions.

While Almotairy et al. (2023) carried out the first quantitative study in Saudi Arabia to investigate nurses' readiness to prescribe medications under supervision, this study had weaknesses in that it failed to place sufficient emphasis on potential areas for nurse prescribing roles, or the particular healthcare conditions for which nurses might prescribe medications. In contrast, the present study expands upon previous research by addressing these gaps and identifying the areas with the most potential to benefit from nurse prescribing roles in primary healthcare clinics. The current study thus contributes to the existing body of knowledge by increasing understanding of the applicability of nurse prescribing role to PHCs, and by identifying potential target areas for nurse prescribing role, particularly in terms of managing chronic diseases in PHCs.

5.4.2.1 Summary

In primary healthcare services, implementing a partnership prescribing approach between nurses and physicians appears to be the most feasible approach to adopting nurse prescribing responsibilities. This approach to implementing the nurse prescribing role appears to have the potential to manage patients with chronic

conditions more effectively. In this partnership prescribing approach, nurses are responsible for providing follow-up care, assessing patients' progress, and prescribing repeat medication, highlighting the valuable role that nursing staff may play in supporting the ongoing care and treatment of patients with chronic conditions within PHCs.

5.5 Research question 2: What are the facilitators of, and barriers to, the nurse prescribing role in Saudi primary healthcare centres from perspectives at the macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses)?

5.5.1 Theme 3: Educational Preparation

The participants across macro, meso and micro-levels acknowledged that a lack of pharmacological knowledge among nurses would be a key obstacle to nurses becoming involved in prescribing responsibilities. Moreover, the participants agreed that the prescribing role should not be implemented until nurses had completed the required educational preparation. The primary facilitator for nurses seeking prescribing authority was the necessity of studying to obtain prescribing competence. This finding is supported by international evidence: in early research carried out in Ireland by Lockwood et al. (2008), inadequate pharmacological knowledge was also identified as a barrier to nurses being able to prescribe medications. It is thus a significant cause for concern that most nurses have a knowledge gap in pharmacology, and the provision of educational preparation prior to nurses taking on prescribing responsibilities is essential.

In the context of Saudi literature, the current study findings contribute to the existing body of knowledge by highlighting the current lack of pharmacological knowledge

among nurses in PHCs. This barrier may prevent nurses from taking on prescribing roles if they do not have proper educational preparation. The findings of the current study highlight the crucial need to manage the pharmacological knowledge gaps among nurses by providing them with access to proper education and training. This would enhance their knowledge and skills that are necessary to assume a prescribing role. Almotairy et al. (2023) conducted a quantitative study to investigate the preparedness of nurses to prescribe medications under supervision in Saudi Arabia. However, Almotairy et al.'s (2023) study did not adequately investigate any constraints potentially associated with nurses' pharmacological knowledge among nurses in PHCs. In recognising the existing problem arising from poor pharmacological knowledge among nurses in PHCs, the current study thus fills a substantial gap in the Saudi literature that other studies had not previously addressed.

The findings of the current study also demonstrate that the majority of participants from the meso and micro levels viewed intensive prescribing programmes as an appropriate means of educating nurses to become qualified in prescribing medications, without the requirement for them to pursue additional degree-level learning. It was generally suggested that such training would be successful in increasing the knowledge and abilities of nurses in relation to the prescribing of medications, although a minority of the participants were of the view that master's degrees would be more suitable for nurses interested in advancing to take on prescribing responsibilities. These findings remain consistent with the international context, however, as educational requirements for the nurse prescribing practice differ among nations. Nurses are authorised to prescribe medications in the UK following successful completion of intensive prescribing programmes that prepare them with the requisite knowledge and competencies to fulfil their prescribing responsibilities (Tan

et al., 2023). On the other hand, certain nations, including the United States, Canada, and Australia, require nurses to achieve advanced nurse practitioner status prior to prescribing medications. Thus, in these latter countries, the completion of masters-level education frequently correlates with the acquisition of prescribing authority (Tan et al., 2023).

Although Almotairy et al. (2023) acknowledged the necessity of educational preparation and training in order to guarantee the appropriate nurse prescribing practices under supervision in Saudi Arabia, they did not conduct an in-depth investigation into the particular educational approaches to be utilised. The findings from the current study thus fill an important gap in the existing literature by reflecting the appropriateness of a variety of approaches to prepare nurses to prescribe medications in Saudi Arabia. Some of the participants supported intensive prescribing programmes, whereas others emphasised the need for master's degrees. These findings therefore build upon the findings of prior study while also emphasising the need for a flexible approach to educationally preparing nurses to expand the scope of their nursing practice to include prescribing authority. It should thus be possible for nurses to identify the educational preparation approach most closely aligned with the professional objectives they have chosen, and it should be widely acknowledged that flexibility is essential in order to provide nurses with the opportunities to choose between advancing their knowledge and skills more broadly or simply expanding their roles within their current practice.

5.5.1.1 Summary

Nurses who work in PHCs currently have knowledge gaps in the realm of pharmacology, highlighting the need for relevant educational preparation. Among the

many educational approaches suggested by the participants, the main two were intensive prescribing programmes and higher degree-level study (master's degree). This highlights the need to develop flexibility in educational approaches in order to facilitate individuals' specific professional aims. By filling these knowledge gaps and providing tailored education, nurses can gain the knowledge and expertise they need to incorporate prescribing practices into their responsibilities within PHCs.

5.5.2 Theme 4: Acceptability of the nurse prescribing role

Participants from the micro, meso, and macro levels in the current study reported that a significant potential obstacle to the implementation of nurse prescribing in primary healthcare clinics was a lack of patient acceptance. This barrier was attributed to patients' unfamiliarity with nurses prescribing roles for them; traditionally, this role has been carried out only by medical professionals. Although an exploratory descriptive qualitative study carried out by Alhamed et al. (2023) did not conduct any targeted exploration of perspectives directly related to the nurse prescribing role; they did find that patients may be opposed to advanced practice nurses (APNs) taking on responsibilities that have traditionally been handled by medical professionals.

Both Alhamed et al. (2023) and this current study thus draw attention to the difficulty of patient acceptance, highlighting its significance as a possible obstacle to expanding or advancing nursing practice. The current study expands upon the findings of Alhamed et al. (2023) by presenting novel evidence concerning the specific obstacles that nurses could face to the implementation of prescribing roles in their nursing practice in PHCs. Furthermore, this current study highlights the need for government organisations and the administrators of PHCs to work on increasing patients' awareness and understanding of nurse prescribing roles. This can be accomplished by illustrating the benefits of the nurse prescribing roles and by highlighting the

competency in prescribing roles. The involvement of these individuals is essential to promoting the acceptance of the nurse prescribing practice among patients.

Participants across different levels perceived that many doctors would be willing to accept nurses taking on prescribing roles in situations where this would reduce their repetitive workloads and enable them to concentrate on more complex cases. However, a few of the participants were concerned that the reluctance of doctors to share the prescribing authority with nurses could be a barrier. Primary care doctors may fear becoming less actively engaged in the treatment of their patients, which could have a detrimental influence on the tasks that they were responsible for. Almotairy et al. (2022) conducted a descriptive cross-sectional study to explore doctors' attitudes about the necessity of nurse practitioners in primary care services in Saudi Arabia. They found that expanding the nurse's role to include additional responsibilities comparable to those of doctors could have a negative impact on the physician's role in primary healthcare services, which in turn could have a negative impact on their employment. Almotairy et al. (2022) and the current study both highlight a potential challenge: if nurses can provide healthcare services similar to those of doctors, this could potentially reduce the demand for doctors. However, the findings of the current study also highlight the potential benefits that nurses with prescribing authority might provide to doctors by sharing prescribing responsibilities with them. These benefits include reducing their workloads and allowing them to focus on more complex situations. However, the current study makes a significant contribution by shedding light on the perspectives of nurses and other stakeholders operating in primary healthcare services (PHCs), a perspective not previously explored in Saudi Arabian studies. In addition, the current study contributes to the existing body of knowledge by highlighting the advantages that the nurse prescribing

role can bring to doctors, potentially enhancing their acceptance of this role within the healthcare system.

Participants at the meso and micro levels revealed that nurses might face difficulties with deciding whether to include the prescribing role alongside with their current responsibilities, due to the likely increased workload and additional responsibilities. The majority of participants from the different three levels, however, were of the opinion that appropriate financial rewards might serve as an effective incentive for nurses to take on new prescribing responsibilities. This finding is supported by evidence from other counties: in a qualitative study by Pearson et al. (2021) involving nurse prescribers in New Zealand, the participants emphasised the need for recognition of the additional responsibility for prescribing in the form of a financial benefit. This was despite the fact that the majority of nurse prescribers did not initially take on their prescribing practice because they expected to receive higher remuneration. Additionally, all six participants in an early qualitative study by Cousins et al. (2012) in the UK emphasised the necessity of financial rewards for their prescribing responsibilities. Otherwise, they felt that their additional prescribing responsibilities were underappreciated.

In the context of Saudi Arabian literature, Kerari et al. (2023) carried out a mixed-method study to explore potential factors that impact nurses' perspectives toward nurse practitioners' roles and whether they are interested in becoming nurse practitioners. A questionnaire was used to gather data, and 77 nurses filled it out. Qualitative interviews were then conducted with 10 of these nurses as part of the data collection process. The findings highlighted that advanced practice nursing includes a broad range of responsibilities, some of which may overlap with those normally

adopted by doctors. One of the obstacles that may prevent nurses from taking on additional responsibilities is increasing workloads; however, this obstacle may be overcome through the provision of rewarding incentives.

The current study more specifically addressed the knowledge gap pertaining to nurses' acceptance of integrating the prescribing role into their existing duties within Saudi PHCs. The findings of the study thus underlined the need to address financial concerns as a means of promoting the acceptance of prescribing responsibilities among nurses. This is essential to support the effective implementation of the nurse prescribing role in PHCs.

5.5.2.1 Summary

It is possible that the integration of the nurse prescribing role into PHCs may confront barriers linked to the acceptability of this role. These barriers include a lack of acceptance from patients, resistance from physicians, and a lack of acceptance among nurses themselves. In order to improve acceptability among patients, it is essential to increase levels of patient knowledge about nurse prescribing and the potential it has to improve accessibility and services. Further, those doctors who recognise the positive effects of nurse prescribing roles, such as decreases in their own prescribing burdens and the ability to focus on more complicated patients, are more willing to accept nurses' prescribing responsibilities. Increasing nurses' acceptance, however, may be most readily achieved by means of the implementation of financial incentives.

5.6 Research question 3: What potential changes are required to expand the roles of nurses to include prescribing in Saudi PHCs from the macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses) perspectives?

5.6.1 Theme 5: Establishing the legality of nursing prescribing practice

The participants across different levels recognised the necessity of establishing distinct legislation and regulations in Saudi Arabia to authorise nurses to prescribe medications in PHCs. As a means of efficiently implementing the nurse prescribing role in Saudi PHCs services, they highlighted the significance of this crucial change, noting it as imperative. Almotairy et al. (2023) also highlighted the importance of supportive legislation, regulation, and relevant health policy. A total of 270 participants out of 379 (73%) acknowledged the significance of these factors in enabling the adoption of nurse prescribing under supervision. Both the current study and Almotairy et al.'s (2023) study highlighted the current gap in the Saudi healthcare system's authorisation of nurse prescribing practice, which is the result of the lack of well-defined legislative frameworks and regulations for the nurse prescribing role. The current study's findings contribute to the body of knowledge by emphasising the critical need to establish a legal framework for nurse prescribing practices, which will smooth the implementation of such roles in Saudi primary healthcare centres. This objective can be achieved through the formulation of clear legislation and regulatory guidelines. In the absence of these necessary changes, the effective introduction and integration of nurse prescribing practices in Saudi Arabia would face significant challenges.

In addition, the findings of current study contribute to the body of knowledge by highlighting the importance of developing comprehensive regulations that address various critical aspects of nurse prescribing role, including defining the scope of nurse prescribing, addressing limitations related to medications, establishing penalties for non-compliance with prescribing regulations, and providing clear guidelines for prescribing practices. In the context of addressing these specific areas, the proposed regulations must provide a framework supportive of the establishment of nurse prescribing practices.

The current study's findings also provide novel insights into several beneficial suggestions for the formulation of suitable regulations for the nurse prescribing role. In order to develop appropriate regulations for the nurse prescribing role in Saudi Arabia, one of the most important suggestions is to learn from other nations where nurses already have the authority to prescribe medications, as these may provide significant insights and direction for the development of regulations. It would also be helpful to recognise some of the possible difficulties that may arise during the implementation of the nurse prescribing role, thus facilitating the development of proactive initiatives to overcome these uncertainties. It is possible that the use of the experiences of other nations might serve as a significant resource for the design of complete regulation of the prescribing of medications by nurses in Saudi Arabia. The findings of the current study also significantly contribute to the body of knowledge by highlighting the significance of incorporating the perspectives of Saudi stakeholders by investigating their opinions; this would provide valuable insights that could be used to ensure that the regulations developed are contextually relevant and aligned with the needs of the local healthcare system.

The participants from the macro, meso, and micro levels believed that restricting prescriptive authority to licensed nurses was necessary. Nurses should be given new job titles and descriptions once they have obtained their licenses to prescribe medications to reflect that they have the legal authority to prescribe medications. It is important to note that Almotairy et al. (2023) focused on investigating the readiness of nurses to prescribe medications under supervision, yet did not delve into the crucial aspect of licensing nurses to prescribe medications; they also did not address the need for appropriate job titles and descriptions. Almotairy et al. (2023) thus failed to consider this necessary aspect of the regulatory framework needed for the proper implementation of the nurse prescribing role. The current study thus offers a novel perspective on areas not previously discussed before, helping to fill a gap in the existing body of Saudi literature. It also highlights the need for formal licensing, as well as for the development of job titles and descriptions that correspond to those licenses, contributing a new perspective on the process of developing the appropriate regulatory framework.

5.6.1.1 Summary

There is a critical need for legislation and regulations in Saudi Arabia to support the adoption of nurse prescribing roles in primary healthcare centers (PHCs). This change is necessary and required; developing regulations that should include defining the scope of nurse prescribing, addressing restrictions on medications, establishing penalties for non-compliance, and providing clear guidance. However, to develop regulations that are both comprehensive and relevant, it is vital to learn from the experiences of other countries while actively involving Saudi stakeholders. Additionally, to effectively implement nurse prescribing roles, it is crucial to restrict prescriptive authority to licensed nurses and establish new job titles and descriptions.

These key changes are necessary for the successful implementation of the nurse prescribing role in Saudi Arabia to achieve the desired outcomes.

5.6.2 Theme 6: Primary healthcare centres' readiness

Participants at all three levels viewed that a number of changes must be made to enhance the infrastructure of PHCs to facilitate the seamless implementation of the nurse prescribing role at organisational level (meso-level). Amongst these changes is a change in the information system used in PHCs, which must support the authority of nurses to issue prescriptions, work with other healthcare professionals in the management of patients' conditions, and give follow-up care and prescriptions. In addition, participants from the macro, meso and micro levels suggested that the current patient pathway used by primary healthcare organisations must be modified in order to minimise the need for patients to see physicians in certain cases.

The current study's findings reveal novel perspectives not previously explored in the Saudi literature. They emphasise the need to make changes to the information systems used by PHCs in order to grant nurses prescribing authority, as well as the necessity of reforming the patient pathway in order to ensure efficient workflows within primary healthcare organisations. These findings fill the gap in understanding the need for constructing robust infrastructure in PHCs, resulting in a significant contribution to the body of knowledge in Saudi Arabia.

The majority of participants at the macro, meso and micro levels in the current study perceived that nurse prescribing role can be effectively and successfully implemented in Saudi PHCs with administrative support at the centre level. Recognising the need for improvements to primary healthcare services and enhancing the patient experience among administrative teams were deemed vital in order to support the implementation

of the nurse prescribing role. This finding supports the evidence reported in an earlier quantitative study conducted in the UK by Kelly et al. (2010). This study explored the barriers that registered nurses faced when seeking independent prescriber qualifications in nursing general practice. Its findings suggested that support from team members, which depended on a team's understanding of the benefits of nurse prescribing role and a positive attitude towards the practice, played a key role in overcoming nurses' reluctance to adopting nurse prescribing practices. The current study's finding implies that it is imperative to acknowledge the significance of administrative team support in facilitating the seamless implementation of the nurse prescribing role in PHCs.

Additionally, the participants from the three different levels acknowledged that nurses who received the authority to prescribe medications would still require ongoing support from doctors to improve their pharmacological knowledge and diagnostic competencies. It was suggested that this could be accomplished by sharing knowledge at regular meetings, engaging in regular discussions of challenging cases, and providing feedback during such sessions. These findings support the evidence reported in an earlier qualitative study conducted in the UK by Carey et al. (2010a). Carey et al. (2010a) investigated various perspectives of the impact of the nurse prescribing role. This study highlighted the need for continuous support, particularly through formal means such as scheduled meetings. The current study's finding implied the vital importance of developing a collaborative and supportive working environment that encourages and promotes ongoing sharing of knowledge and experience among nurses and doctors.

The participants of the current study also emphasised the importance of monitoring clinical performance indicators of nurse prescribing practice in order to detect and manage possible adverse health outcomes. In addition, they emphasised the need to monitor patient case management to guarantee that nurses with prescribing authority adhered to strict standards, limiting the possibility of patients experiencing avoidable harm. These findings align with those of a qualitative study conducted by Courtenay et al. (2011) in the UK. Courtenay et al.'s (2011) study also highlighted the necessity of clinical governance systems within organisations, including monitoring prescribing practices, and detecting and dealing with prescribing-related governance concerns. The finding of the current study indicated that proactive monitoring is needed to assist in identifying areas for improvement, boosting standardised prescribing practice to ensure patient safety.

The participants across the three levels suggested that nurses with prescribing authority should engage in CPD to maintain appropriate levels of familiarity with treatment standards relevant to their specific areas of prescribing practice. This may necessitate to ensure that their prescribing decisions align with the latest evidence-based guidelines, which is also useful for promoting accuracy and safety in medications prescribing. These findings correlate with the early findings reported by Stenner et al. (2008) in the UK. Stenner et al. (2008) explored the views of nurse prescribers concerning interprofessional relationships and support for the nurse prescribing role for patients experiencing acute and chronic pain. Stenner et al. (2008) also highlighted the need for specific CPD for nurse prescribers, emphasising various barriers that hindered access to CPD at the necessary level, including funding constraints, insufficient protected learning time, and inadequate managerial support. These restrictions were shown to contribute to the difficulties that nurse prescribers

had with seeking the proper CPD resources. The finding of the current study suggests that nurses with prescribing authority must continuously improve and update their knowledge and skills pertinent to their prescribing areas to guarantee safe prescribing practices.

5.6.2.1 Summary

The successful implementation of the nurse prescribing role in PHCs depends on several critical factors at the organisational level. The readiness of these centres is a crucial change, though this may be achieved through changing the infrastructure of centres and the provision of adequate administrative support. Ongoing support from doctors through the exchange of knowledge and experience is needed to enhance nurse's competency in the prescribing role. Ensuring safe nurse prescribing practice is vital for patient safety, and this must include monitoring nurse prescribing practices and prioritising CPD to enhance nurses' knowledge and skills.

5.7 Strengths and limitations of study

As far as the researcher is aware, this is the first exploratory descriptive qualitative study conducted in Saudi Arabia that explores the readiness for expanding nursing practice to include a prescribing role in Saudi Arabian primary healthcare centres. It is thus intended to provide useful knowledge and to fill a distinct gap in the Saudi literature. The study's main strength lies in its exploratory descriptive methodology, which includes a thorough exploration of unexplored areas and an in-depth description of the gathered data. This in turn provided a comprehensive understanding of perspectives regarding the introduction of nurse prescribing and the factors that may hinder or facilitate nurses' uptake of prescribing roles in Saudi Arabia. In addition, the present study provides deeper clarity on the crucial changes needed to

properly integrate nurse prescribing authorities into current practice, thus contributing to a growing body of knowledge in the areas of implementation of nurse prescribing practices in Saudi Arabia.

The sample size for this study was 25 participants; this was deemed sufficient for a qualitative study, as data were collected until saturation was reached. The researcher recruited participants only from PHCs in the south of Saudi Arabia. However, the findings of the current study may not reflect the perspectives of primary healthcare nurses, managers, and supervisors across Saudi Arabia as a whole. Primary healthcare centres in the south of the country may not be representative of the national situation due to their access to different resources, workforces, populations, and working conditions compared to other areas in Saudi Arabia. Nurses, managers, and supervisors from other regions in Saudi Arabia might thus provide different perspectives regarding the implementation of the nurse prescribing role in PHCs.

The involvement of participants, including nurses at the practice level, managers and nursing supervisors at the organisational level, and policymakers at the national level, helped to provide a comprehensive understanding of readiness from many different viewpoints, allowing the researcher to triangulate the data more effectively. This also enhanced the richness and diversity of the data, with each level providing insights into various readiness complexities from their unique perspectives. The inclusion of three levels thus ensured that all aspects of readiness were addressed, generating data that were mostly comprehensive and representative. However, the study was limited in that certain stakeholders, such as patients and physicians, who might have valuable insights, were not included; this omission may be particularly relevant to concerns

over the acceptance of nurse prescribing. Thus, the acceptance of the nurse prescribing role is not fully understood.

This study also focused on PHCs in order to elicit specific knowledge about the readiness for expanding nursing practice to include a prescribing role in this setting. This particular focus allows for the transferability of findings to similar settings. However, the findings cannot be transferred to other healthcare settings, such as secondary or tertiary care, or to other nations owing to differences in healthcare systems.

5.8 Conclusion

The study findings indicate that the introduction of the nurse prescribing role in Saudi PHCs may have the potential to bring about improvements in primary healthcare services. The findings reveal that the incorporation of nurse prescribing into nursing practice may lead to reduced waiting times for patients and increasing accessibility to medication, as nurses would be authorised to fulfil more patient needs, including medication prescriptions. This would likely positively impact primary healthcare services, as a result of implementing the nurse prescribing role.

This study thus makes a key contribution to promoting the introduction of the nurse prescribing role in partnership with independent prescribers (doctors), particularly with an emergent emphasis on chronic diseases and conditions. The current study's findings make a further key contribution by identifying the significant barriers posed by the current lack of knowledge and skills in prescribing among nurses, noting that addressing these barriers is crucial for the successful implementation of the nurse prescribing role. Furthermore, it highlights the need for nurses to develop their

knowledge in pharmacology alongside their diagnostic skills by means of educational preparation.

The current study also identified various educational approaches to acquire the necessary knowledge for the prescribing role, including intensive prescribing programs that enable registered nurses to prescribe medications, as well as master's degrees. These offer multiple potential ways to enhance the competencies of nurses to fill the prescribing role. In addition, the study contributes by drawing attention to the flexibility of educational approaches that might be used to prepare nurses for the prescribing role. However, this highlights the necessity of determining an appropriate educational level that will equip nurses with the necessary competencies to implement prescribing practices in Saudi PHCs. In addition, it draws attention to the need to determine the educational requirements for those desiring to take on a prescribing role, taking into account factors such as experience level and educational background.

This study highlights that a lack of patient acceptance of the nurse prescribing role may be driven by factors such as unfamiliarity and a lack of confidence in nursing knowledge and experience in prescribing practice. Its findings also contribute to addressing this, however, by identifying the need for increased patient awareness, which could be facilitated by government organisations at a national level and by administrators in PHCs at an organisational level. It is vital to make efforts to raise awareness in order to promote acceptance among patients. Doctors' lack of acceptance of the nurse prescribing role was also highlighted as a potential barrier, although the majority of the participants perceived that nurse prescribing role had the potential to alleviate doctors' workloads and reduce the work pressure on them, which could help to raise acceptance among doctors. This study's findings also reveal that if

nurses take on the prescribing role, this would mean increased workloads and responsibilities, which may lead to resistance to the adoption of this expanded role. However, several different factors, including financial incentives and nurses' desires to enhance their knowledge and experience, may contribute to greater acceptance among nurses.

This study also emphasised the need to implement significant changes in order to appropriately establish the role of nurse prescribing at both the national and primary healthcare organisation levels. It is essential to develop appropriate legislation, regulations, and policies in order to enable legal nurse prescribing in Saudi Arabia and to ensure that this is acknowledged as being legitimate. This study's findings contribute by highlighting the significance of restricting prescriptive responsibility to licensed nurses, ensuring that only nurses who demonstrate and maintain their competence in prescribing can prescribe medications. The current study's findings make a further contribution by emphasising the necessity for significant changes to be implemented at the PHC level, where substantial preparations are necessary for the implementation of this role. This study highlighted the necessity of modifying the infrastructure of PHCs, which includes changing patient pathways and information systems, to ensure a seamless and effective implementation of the nurse prescribing role.

Overall, this study uncovered the need for support for the adoption of nurse prescribing across a variety of aspects in PHCs. It is thus of the highest priority that leadership teams develop an understanding of the nurse prescribing role, as well as formally recognising its relevance and value in healthcare services. This is essential to provide the necessary support to guarantee the success of this implementation.

Ongoing support from doctors is also essential for nurses who are licensed to prescribe medication, particularly in relation to the exchange of knowledge between nurses and medical professionals.

At the organisational level, it is crucial to implement strict measures to ensure the safety of nurse prescribing. These measures include regular monitoring and reviews of prescription practices, the management of potential harm to patients, the provision of opportunities for CPD, and the management of mal-prescription via requalification and training.

5.9 Contribution to knowledge

The findings of this exploratory descriptive qualitative study will make a significant contribution to the Saudi nursing literature by revealing novel perspectives on the readiness to include the prescribing role in nurse practice in Saudi PHCs. The study involved nurses at the practice level as well as other stakeholders, including policymakers at the national level and leaders at the organisational level. Including different participants at multiple levels, not limited to the practice level, ensured that all perspectives of the implementation of the nurse prescribing role are included, which certainly makes an effective exploration of current readiness. The current study identified the potential benefits associated with nurse prescribing practice and how it could be implemented in PHCs in Saudi Arabia. The study also delved into a range of factors that could either help or hinder, as well as the need for changes to implement the nurse prescribing role in Saudi primary healthcare centres. This thorough exploration into the potential advantages and prescribing approach that can be implemented, the factors that impact the implementation, and the necessary modifications for the role's implementation has yielded a comprehensive

understanding of the readiness to include prescribing role into nursing practice in PHCs. Policymakers at the national level can benefit from the current study's findings as they provide an understanding of the potential benefits of implementing the nurse prescribing role, its implementation approach, potential obstacles and enablers, and the necessary adjustments that Saudi healthcare system will need to make at various levels to implement this role. These will help to develop regulations, guidelines, and nursing education programmes that incorporate prescribing competencies, and to prepare PHCs to support implementation.

5.10 Recommendations

In accordance with the study's findings, the following recommendations for policymakers, education, practice and further research emerged:

5.10.1 Recommendations for policymakers

- Evaluate the needs of the Saudi healthcare system to identify healthcare service deficiencies that could be addressed by giving nurses prescribing authority in primary healthcare centres. This should involve the collection of data from a diverse range of sources, including healthcare providers documents, patient records, and community surveys.
- Prior to implementing the nurse prescribing role in Saudi Arabia, it is important to discover the opinions of key stakeholders (administrators, educators, and healthcare professionals) and achieve consensus on the scope of nurse prescribing authority, guidelines for implementation, the allocation of responsibilities, core training requirements and key evaluation metrics. This should be achieved in conjunction with the collection of data on the opinions of service users themselves in terms of the acceptance of nurse prescribing practices.

- Gain insights from international experiences regarding the implementation of the nursing prescribing practices in order to adopt proven strategies and overcome prevalent challenges that may arise during the early stage of adoption.
- Develop clear implementation strategy that delineates the necessary steps, time frames, and resources to integrate the prescribing into nursing practice. The plan must include clear objectives and summative criteria to meet them.
- Develop and implement dedicated legislation and regulations to clarify the nurse prescribing role in Saudi Arabia. These regulations should shape the scope of prescribing practice and the responsibilities of nurses with prescribing authority.
- Develop comprehensive policies that direct nurse prescribing practices in alignment with the relevant legislation and regulations. These policies should address areas such as prescribing rules, medication formularies, documentation requirements, and collaborative practice with other medical professionals.
- Develop job titles and descriptions for nurses who can prescribe medications that reflect their legal ability to prescribe medications. These job titles and descriptions should also effectively connect with nurses' responsibilities in prescribing practice within the healthcare system.
- Restrict prescriptive rights to licensed nurses who have completed the necessary education and training. This is necessary to ensure that only qualified nurses engage in prescribing practice.
- Conduct pilot initiatives in select primary healthcare facilities to assess the feasibility of integrating the prescribing role in nurse practice and learn from both the successes and failures, which can inform broader implementation strategies.
- Develop targeted awareness initiatives to educate service users about nurse prescribing roles within primary healthcare centres. These initiatives should

illuminate the qualifications and training of the nurses and the advantages associated with the nurse prescribing role. Providing comprehensive information is likely to improve patients' understanding and acceptance of the nurse prescribing role within the realm of primary healthcare.

- Address potential scepticism regarding the benefits and importance of the nurse prescribing role in primary healthcare among leadership teams in PHCs by introducing appropriate awareness programmes. These programmes should inform leadership members about the benefits and positive outcomes of nurse prescribing for healthcare services, which may enhance support from leadership teams for the nurse prescribing role.
- Promote the adoption of the new prescribing role among nurses by offering appropriate financial incentives. These incentives should help to acknowledge the expanded scope of practice and increased responsibilities related to prescribing while also motivating nurses to accept such responsibilities.

5.10.2 Recommendations for education

- Educationally prepare nurses before initiating prescribing practice to ensure that they have the proper knowledge and experience in prescribing; this is an important facilitator, based on the current lack of knowledge and experience in prescribing practice among nurses in PHCs.
- Improve undergraduate curricula to include stronger pharmacology streams, ensuring that nurses have the necessary knowledge to make informed decisions about prescribing and a sound understanding of medications to prepare them for potential prescribing roles.

- Collaborate among national educational institutions to develop and provide appropriate educational programmes that are in accordance with international standards while also accommodating to the needs of the Saudi healthcare system.
- Develop flexible educational approaches (master's degrees or intensive programmes in prescribing that offer comprehensive theoretical knowledge and supervised practice opportunities in either stand-alone modules or as part of a degree course) to prepare nurses for their prescribing role.
- Establish clear entry requirements in terms of the level of nursing experience and nursing degree that candidates must hold before enrolling in further training, offering transparency and consistency in the selection process.
- Consider nurses having sufficient years of experience and demonstrating the ability to understand the diagnosis and diseases as necessary enrolment requirements for educational preparation.
- Establish partnerships with healthcare facilities to enable practical training for nursing students is needed to provide them with prescribing clinical experience.

5.10.3 Recommendations for practice

- Consider the benefits of integrating the nurse prescribing role into nursing practice in the Saudi primary healthcare system in terms of ensuring more immediate access to healthcare and medications and reduced wait times.
- Give priority to the implementation of nurse prescribing roles in partnership with doctors in primary healthcare centres for chronic medical conditions.
- Develop a clear structure that facilitates effective and coordinated management of chronic conditions through the partnership prescribing approach. This structure must outline the various guidelines for managing chronic conditions, including defining which chronic diseases and conditions can be managed by

nurses and what medications can be prescribed in partnership, defining parameters to permit ongoing care to be monitored to assess patient progress.

- Establish a framework that clearly delineates the roles and responsibilities of nurses and doctors in partnership prescribing, with the aim of fostering effective communication channels for successful implementation in primary healthcare services.
- Prepare PHCs infrastructure by updating the information systems at the primary healthcare level to provide nurses with prescribing authority. This change would ensure documenting and tracking of nurse-prescribed medication, offering seamless interaction with other healthcare providers involved in patient care. Additionally, the existing patient pathway within PHCs must be modified to remove the necessity for patients to see a doctor in certain cases that can be effectively managed by nurses.
- Continuously support nurses with prescribing authority at centre level by ensuring regular meetings, knowledge sharing, and positive interactions between nurses and doctors to contribute to enhancing nurses' confidence and competence in the prescribing role.
- Provide adequate support to licensed nurses to prescribe medications by managing the workloads associated with juggling both a prescribing role and normal nursing responsibilities. This may help address nurses' concerns about the increased responsibilities and workloads associated with nurse prescribing, as well as promote greater acceptance of and engagement with such roles.
- Regularly monitor nurse prescribing practice and perform analysis of clinical performance indicators to ensure the safety of nurse prescribing practice.

- Provide licensed nurses to prescribe medications with the appropriate support and resources at the organisational level to enable them to access to CPD.

5.10.4 Recommendations for future research

- There is a need to explore the perceived benefits for nurse prescribing practice in primary healthcare centres from the perspective of primary healthcare service users in KSA, taking into account the regional and cultural differences among service users.
- There is a need to explore the potential benefits for nurse prescribing in primary healthcare centres from perspective of doctors who working in primary healthcare centres.
- There is a need to explore the factors influencing patients' acceptance and resistance toward the nurse prescribing in primary healthcare centres from the perspective of primary healthcare service users.
- There is a need to explore the factors influencing doctors' acceptance and resistance toward nurse prescribing in primary healthcare centres from the perspective of doctors working in such centres.
- A national survey is required to investigate the attitudes of doctors and service users towards the nurse prescribing role in primary healthcare centres. A study of this type would allow the collection of data from a large number of participants to develop a better understanding of how various parties feel about the nurse prescribing role.
- A national survey study to investigate the attitudes of primary healthcare centre nurses with respect to them taking on a prescribing role should be undertaken. This should be based on large sample size and conducted across multiple primary healthcare centres in different regions in Saudi Arabia.

- There is a need to explore the perspectives of policymakers, nurses and other stakeholders' regarding nurse-doctor partnership prescribing and its potential impacts in terms of improving primary healthcare centre services and patient outcomes.
- There is a need to explore policymakers, nurses, and other stakeholders' perspectives toward the necessary regulatory frameworks and guidelines related to nurse prescribing roles in Saudi Arabia.

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Appendix A: Table 1 (Search Syntax)

Database	Keywords	Results
Medline	(nurse* prescrib*/ OR prescriptive authority AND (barrier* AND ((facilitat*)	189
Embase	(nurse* prescrib*/ OR prescriptive authority AND (barrier* AND ((facilitat*)	186
PubMed	(nurse* prescrib*/ OR prescriptive authority AND (barrier* AND ((facilitat*)	209
CINAHL	(nurse* prescrib*/ OR prescriptive authority AND (barrier* AND ((facilitat*)	118
Scopus	(nurse* prescrib*/ OR prescriptive authority AND (barrier* AND ((facilitat*)	219
Web of Science	(nurse* prescrib*/ OR prescriptive authority AND (barrier* AND ((facilitat*)	295
Total		1216

Appendix B: Table 2 (Screening and selection table)

Population	Include Nurse prescribers Nurse practitioners Nurse specialist Non-prescribing nurses Educators Administers Other healthcare providers	Exclude Physicians Pharmacists Physiotherapists Radiographers Dentists
Intervention	Include Studies explored the factors that affect the nurse prescribing role	Exclude Studies investigated factors that influence prescribing practice among doctors, pharmacists, physiotherapists, radiographers, and dentists.
Comparators	Include Do not apply	Exclude Do not apply
Outcome	Include Facilitators Obstacles	Exclude Don't report any findings that meet the inclusion criteria.
Settings	Include Primary, secondary, and tertiary	Exclude Do not apply
Study design	Include Quantitative Qualitative Mixed methods	Exclude Secondary research Specialists' opinions Abstracts from conferences
Language	English language	Studies published in languages other than English

Appendix C: Table 3 (Excluded studies after full-text reading with reasons for their exclusion)

Title	Author	Year	Reason for excluding
1-The occupational profile and associated training needs of the nurse prescriber: an empirical study of family planning nurses	Tyler, C. Hicks, C.	2001	No data associated with barriers and facilitators
2- Assessing the skills for family planning nurse prescribing: development of a psychometrically sound training needs analysis instrument	Hicks, C. Tyler, C. R.	2002	No data associated with barriers and facilitators
3- Preparing CNSs for prescriptive authority: Winona State University Model Course	Tucker, S. Rhudy, L.	2003	Only 4 participants
4- Nurse prescribers' experiences of prescribing	Lewis-Evans, A. Jester, R.	2004	This study provided limited data about barriers and facilitators of their prescribing practice.
5- Benefits and challenges of nurse prescribing	While, A. E. Biggs, K. S. M.	2004	Lack of depth of exploration and description of barriers and facilitators of their prescribing practice.
6- An emerging picture of mental health nurses as non-medical prescribers	Hemingway	2005	No data associated with barriers and facilitators
7- Nurse prescribers: who are they and how do they perceive their role?	Bradley, E. Campbell, P. Nolan, P.	2005	The participants in this study were nurses (students) in prescribing programme. Although the raised some expected concerns which can be barriers, these barriers were not based on their actual experience after initiating their prescribing practice.
8-A preliminary evaluation of the first e-learning nurse prescribing course in England	Betts, H. Burgess, J. Korean Soc Med, Informat.	2006	This study only included limited number of student (n=14) beside it only allow them to evaluate e-learning nurse prescribing course. No barriers or facilitators were reported.
9-Neuropharmacology and mental health nurse prescribers	Skingsley, D. Bradley, E. J. Nolan, P.	2006	No data associated with barriers and facilitators. Only focused on a 'top-up' course in neuropharmacology for mental nurse prescribers.

Appendix C Continued

Title	Author	Year	Reason for excluding
10-Independent extended and supplementary nurse prescribing for patients with skin conditions: a national questionnaire survey	Courtenay, M. Carey, N.	2006	No data associated with barriers and facilitators.
11- Impact of nurse prescribing: a qualitative study	Bradley, E. Nolan, P.	2007	No data associated with barriers and facilitators. Only focused on impact of nurse prescribing role.
12-Independent extended supplementary nurse prescribers, their prescribing practice and confidence to educate and assess prescribing students	Courtenay, M. Carey, N. Burke, J.	2007	Not explored barriers and facilitators experienced by NP.
13-Mental health nurse supplementary prescribing: experiences of mental health nurses, psychiatrists and patients	Jones, M. Bennett, J. Lucas, B. Miller, D. Gray, R.	2007	Limited data on barriers and facilitators
14-Perceptions and practice of concordance in nurses' prescribing consultations: Findings from a national questionnaire survey and case studies of practice in England	Latter, S. Maben, J. Myalla, M. Young, A.	2007	Not explored barriers and facilitators experienced by NP.
15-The role of the nurse prescriber: the views of mental health and non-mental health nurses	Nolan, P. Bradley, E.	2007	Not explored barriers and facilitators experienced by NP.
16-Children's nurses and nurse prescribing: a case study identifying issues for developing training programmes in the UK	Pontin, D. Jones, S	2007	Limited data on barriers and facilitators
17-Nurse supplementary prescribing for patients with diabetes: a national questionnaire survey	Carey, N. Courtenay, M.	2008	Limited data on barriers and facilitators
18-Exploring independent nurse prescribing for mental health settings	Jones, A.	2008	Limited data on barriers and facilitators (take about the training programme)
19- Nurse prescriber-patient consultations: a case study in dermatology	Courtenay, M. Carey, N. Stenner, K.	2009	Not explored barriers and facilitators experienced by NP.
20- Independent mental health nurse prescribing	Jones, A. Harborne, G. C.	2009	Not explored barriers and facilitators experienced by NP.

Appendix C Continued

Title	Author	Year	Reason for excluding
21- Views on implementing nurse prescribing in a specialist children's hospital	N, Carey K, Stenner	2009	Not explored barriers and facilitators experienced by NP.
22- Nurse prescribing: A vehicle for improved collaboration, or a stumbling block to inter-professional working?	Fisher, R.	2010	Not explored barriers and facilitators experienced by NP.
23- Does psychopharmacology training enhance the knowledge of mental health nurses who prescribe?	Jones, M. Robson, D. Whitfield, S. Gray, R.	2010	Lack of depth of data on barriers and facilitators
24- District nurses prescribing as nurse independent prescribers	F, Downer	2010	Not meet the inclusion criteria (exclude district nurse)
25-Nurse prescribing in specialist mental health (Part 1): the views and experiences of practising and non-practising nurse prescribers and service users	Earle, E. A. Taylor, J. Peet, M. Grant, G.	2011	Lack of depth of data on barriers and facilitators
26 -non-medical prescribing: audit, practice and views	Gumber, R. Khoosal, D. Gajebasia, N.	2012	Lack of depth of data on barriers and facilitators. Beside that no clear distinguish between nurse prescriber and other group of prescribers such as pharmacist
27- Prescribing for pain - how do nurses contribute? A national questionnaire survey	Stenner, K. Carey, N. Courtenay, M.	2012	Limited data on barriers and facilitators
28- The prescribing practices of nurses who care for patients with skin conditions: a questionnaire survey	Carey, N. Courtenay, M. Stenner, K.	2013	Limited data on barriers and facilitators

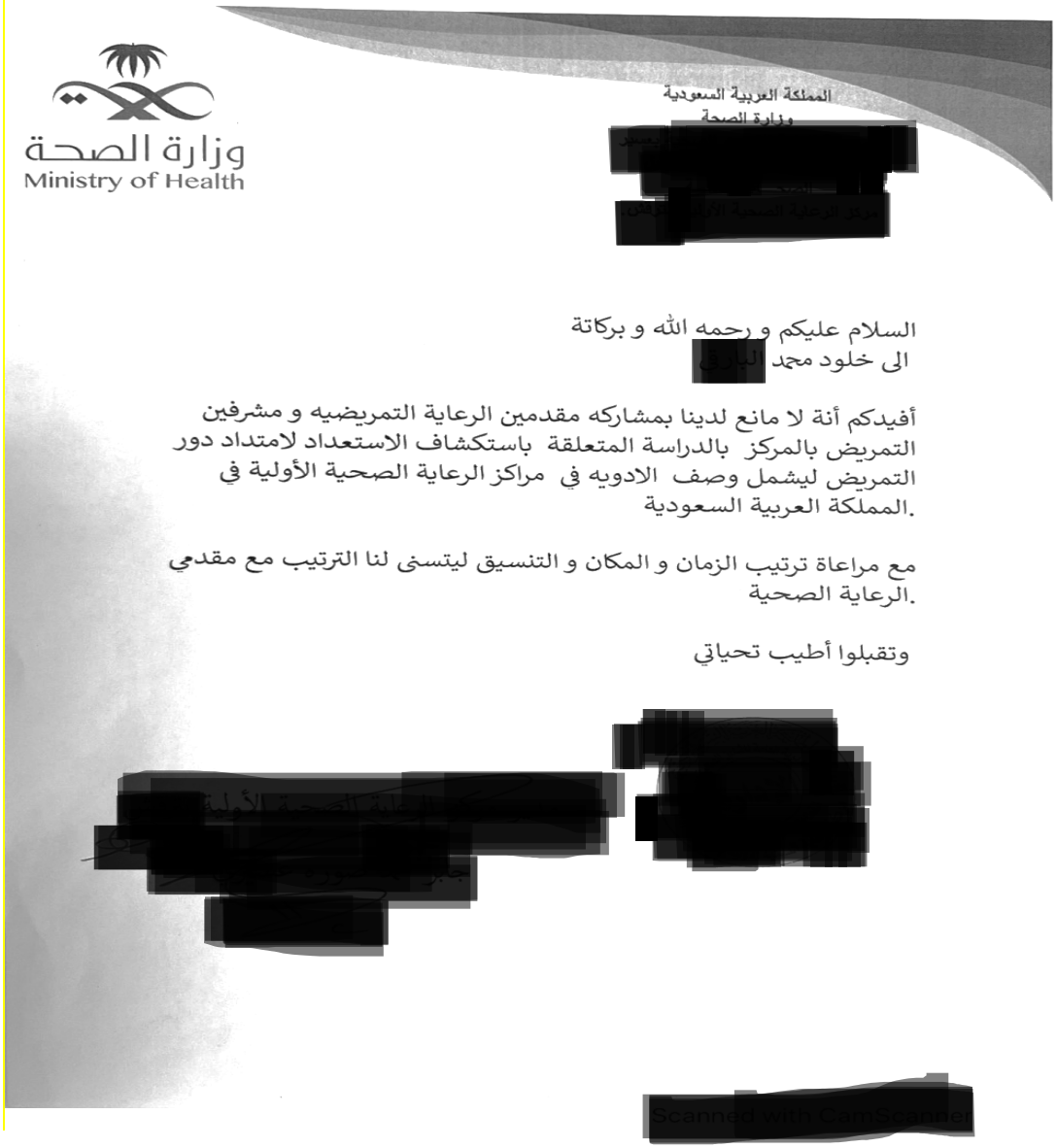
Appendix C Continued

Title	Author	Year	Reason for excluding
29- Interprofessional education between nurse prescribing and medical students: A qualitative study	Courtenay, M.	2013	Not explored barriers and facilitators experienced by NP.
30- An evaluation of team and individual formularies to support independent prescribing in mental health care	Dobel-Ober, D. Bradley, E. Brimblecombe, N	2013	Limited data on barriers (Formularies)
31- An exploration of how nurse prescribing is being used for patients with respiratory conditions across the east of England	Carey, N. Stenner, K. Courtenay, M.	2014	Limited data on barriers Which were associated with managing patient with respiratory conditions
32- Changes in nurses' views and practices concerning nurse prescribing between 2006 and 2012: results from two national surveys	Kroezen, M. de Veer, A. Francke, A. Groenewegen, P. van Dijk, L.	2014	Not explored barriers and facilitators experienced by NP.
33- District nurses' prescribing practice and its link to structural conditions	Blanck, S. Engström, M.	2015	Not explored barriers and facilitators experienced by NP.
34- Non-medical prescribing in palliative care: A regional survey	Ziegler, L. Bennett, M. Blenkinsopp, A. Coppock, S.	2015	Not explored barriers and facilitators experienced by NP.
35-The Need for and Value of Nurse Prescribing for Frail Elderly Persons: Findings of a 2017 Irish Study	Wilson, D. M. Murphy, J. Fahy, A.	2018	Not explored barriers and facilitators experienced by NP

Appendix C Continued

Title	Author	Year	Reason for excluding
36- Development and Validation of the Nurse Prescribing Self-Efficacy Scale	Galiana-Camacho, T. Ruiz-Fernez, M. D. Dobarrio-Sanz, I. Granero-Molina, J. Fernez-Sola, C. Hernez-Padilla, J. M.	2021	Not explored barriers and facilitators experienced by NP
37-Barriers and Facilitators of Advanced Practice Registered Nurse Participation in Medication Treatment for Opioid Use Disorder: A Mixed Methods Study	Spetz, J. Chapman, S. Tierney, M. Phoenix, B. Hailer, L.	2021	barriers and facilitators experienced by NP were limited to opioid Use disorder.
38- Facilitators and Barriers to Nurse Practitioners Prescribing Methadone for Opioid Use Disorder in Nova Scotia: A Qualitative Study	Bates, A. E. Martin-Misener, R	2022	barriers and facilitators experienced by NP were limited to prescribing Methadone for Opioid Use Disorder
39- The development of nurse prescribing in mental health services: Outcomes from five national surveys 2004-2019	Brimblecombe, N. Dobel-Ober, D.	2022	Not explored barriers and facilitators experienced by NP
40- Translation, Cross-Cultural Adaptation, and Validation of the Galician Version of the Nurse Prescribing Self-Efficacy Scale	Franco-Rodriguez, A.Dominguez-Martis, E. M. Mosteiro-Miguens, D. G.Lopez-Ares, D. Coton-Sanchez, B.Dominguez-Varela, M. Novio, S.	2022	Not explored barriers and facilitators experienced by NP
41- Characteristics of prescribing activity within primary care in Scotland 2013-2022 of general practitioners, nurse, pharmacist and allied health prescribers: A retrospective cross-sectional study	MacVicar, S. Paterson, R. E.	2023	Not explored barriers and facilitators experienced by NP
42- Independent prescribing in primary care: A survey of patients', prescribers' and colleagues' perceptions and experiences	Hindi	2019	Include different prescribers were not clear nurses barriers and facilitators
43- Why don't trained community nurse prescribers prescribe?	Hall, J. Cantrill, J. Noyce, P.	2006	Barriers were explored at community level not setting level
44-Evaluating nurse prescribers' education and continuing professional development for independent prescribing practice: Findings from a national survey in England	Latter, S. Maben, J. Myall, M. Young, A.	2007	No interest

Appendix D: Access letter from the gatekeeper



وزارة الصحة
Ministry of Health

المملكة العربية السعودية
وزارة الصحة

[redacted]

السلام عليكم و رحمه الله و بركاتة
الى خلود محمد [redacted]

أفيدكم أنة لا مانع لدينا بمشاركه مقدمين الرعاية التمريضيه و مشرفين التمريض بالمركز بالدراسة المتعلقة باستكشاف الاستعداد لامتداد دور التمريض ليشمل وصف الادويه في مراكز الرعاية الصحية الأولية في المملكة العربية السعودية.

مع مراعاة ترتيب الزمان و المكان و التنسيق ليتسنى لنا الترتيب مع مقدمي الرعاية الصحية.

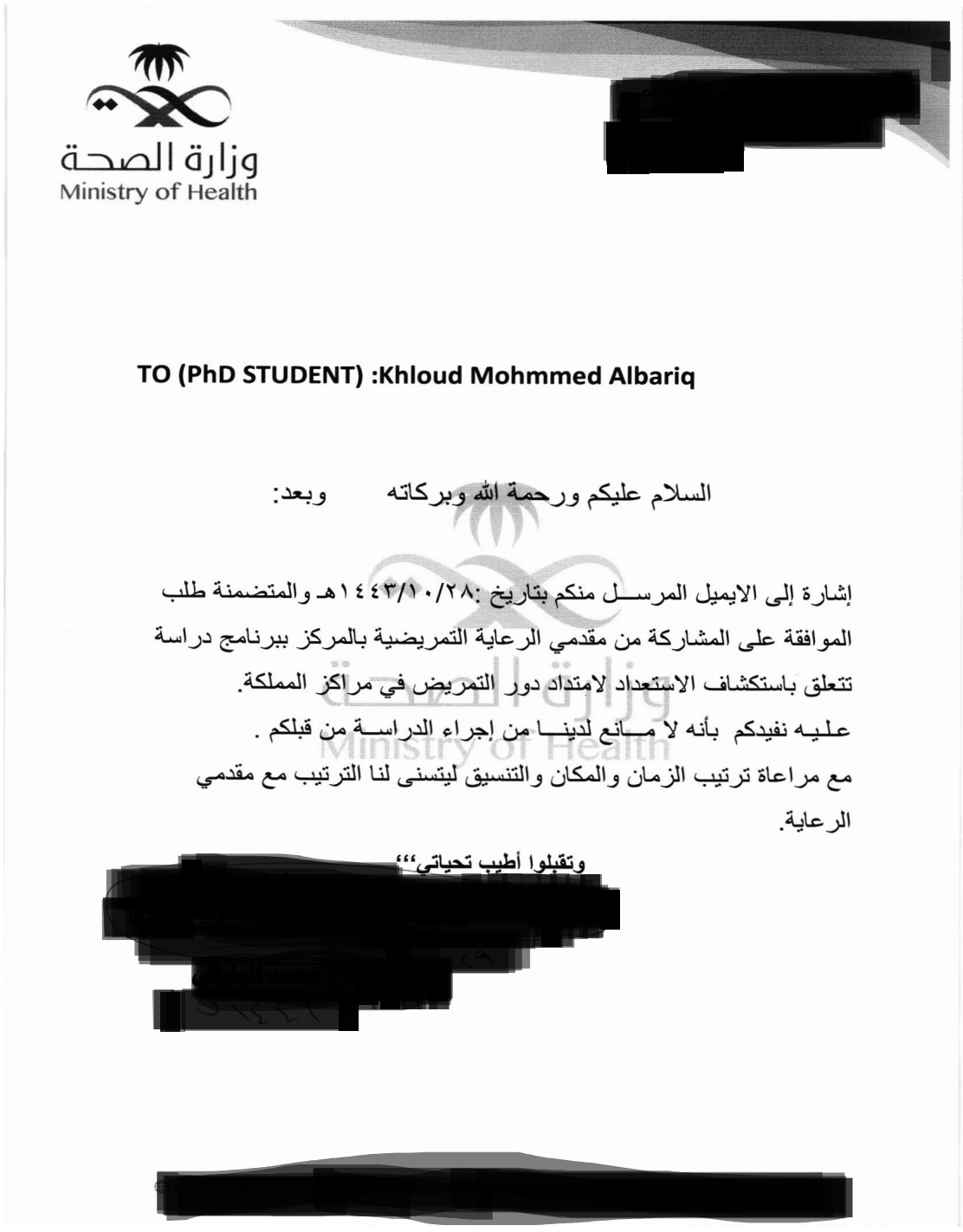
وتقبلوا أطيب تحياتي

[redacted]

[redacted]

Scanned with CamScanner

Appendix E: Access letter from the gatekeeper



وزارة الصحة
Ministry of Health

[redacted]

TO (PhD STUDENT) :Khloud Mohmmed Albariq

السلام عليكم ورحمة الله وبركاته وبعد:

إشارة إلى الايميل المرســل منكم بتاريخ :١٤٤٣/١٠/٢٨هـ والمتضمنة طلب الموافقة على المشاركة من مقدمي الرعاية التمريضية بالمركز ببرنامج دراسة تتعلق باستكشاف الاستعداد لامتداد دور التمريض في مراكز المملكة.

عـلـيـه نفيدكم بأنه لا مــانع لدينــا من إجراء الدراســة من قبلكم .

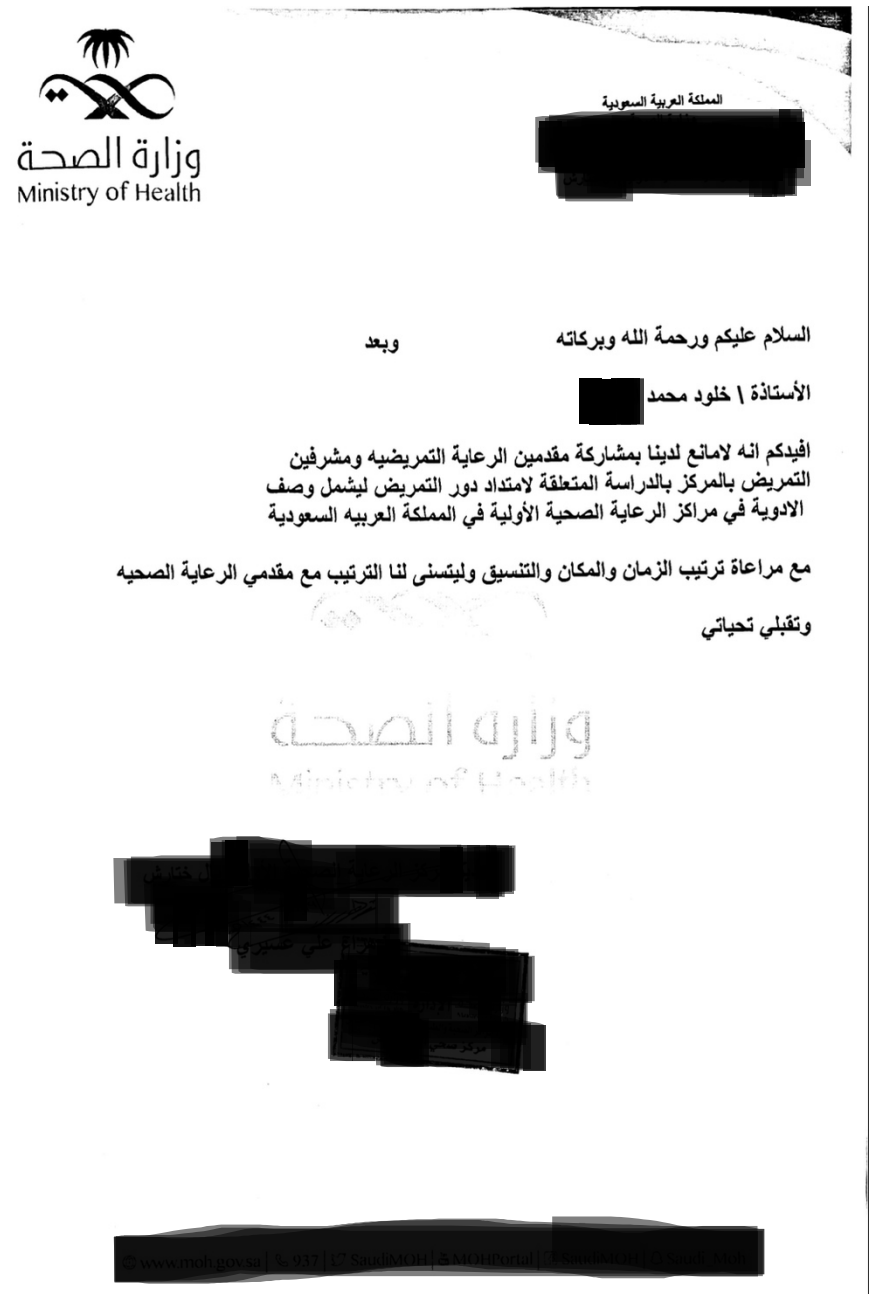
مع مراعاة ترتيب الزمان والمكان والتنسيق ليتسنى لنا الترتيب مع مقدمي الرعاية.

وتقبلوا أطيب تحياتي،،،

[redacted]

[redacted]

Appendix F: Access letter from the gatekeeper



وزارة الصحة
Ministry of Health

المملكة العربية السعودية
[redacted]

السلام عليكم ورحمة الله وبركاته وبعد

الأستاذة \ خلود محمد [redacted]

افيدكم انه لامانع لدينا بمشاركة مقدمين الرعاية التمريضيه ومشرفين التمريض بالمركز بالدراسة المتعلقة لامتداد دور التمريض ليشمل وصف الادوية في مراكز الرعاية الصحية الأولية في المملكة العربيه السعودية

مع مراعاة ترتيب الزمان والمكان والتنسيق وليتسنى لنا الترتيب مع مقدمي الرعاية الصحيه

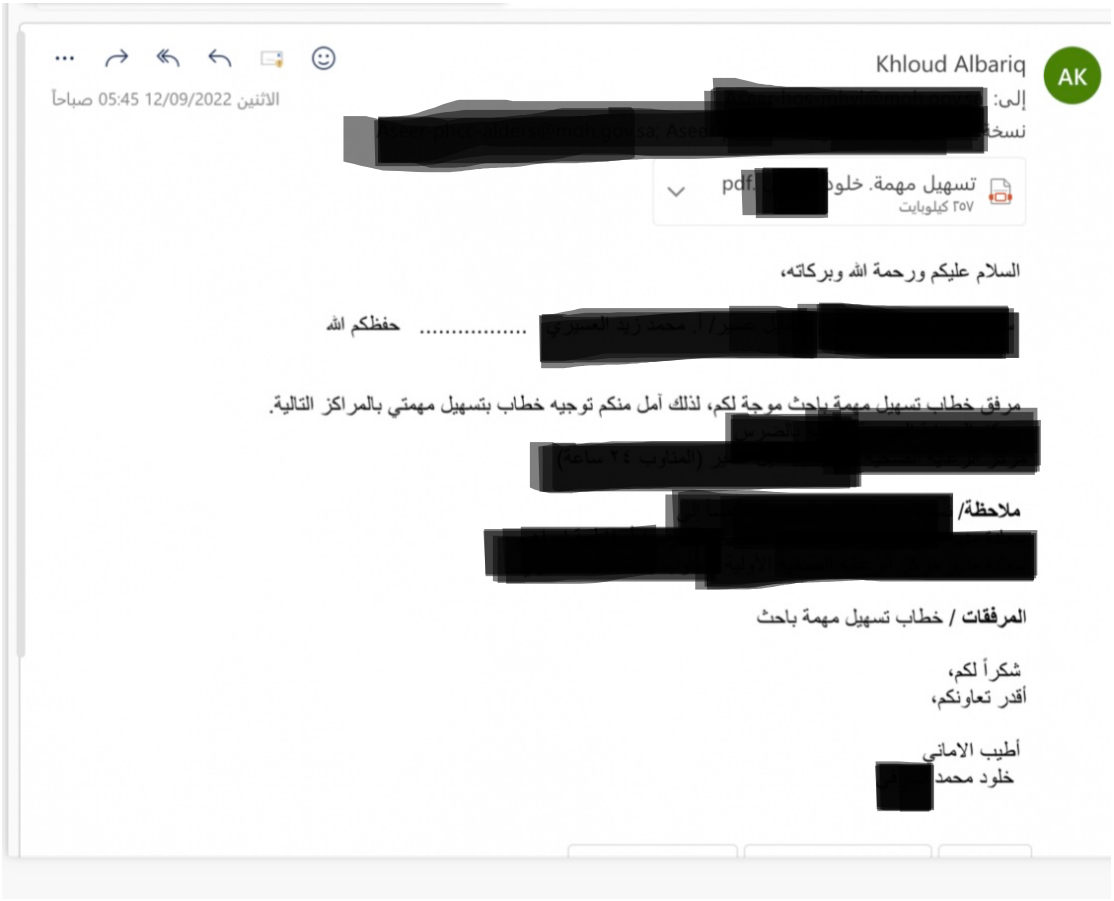
وتقبلي تحياتي

وزارة الصحة
Ministry of Health

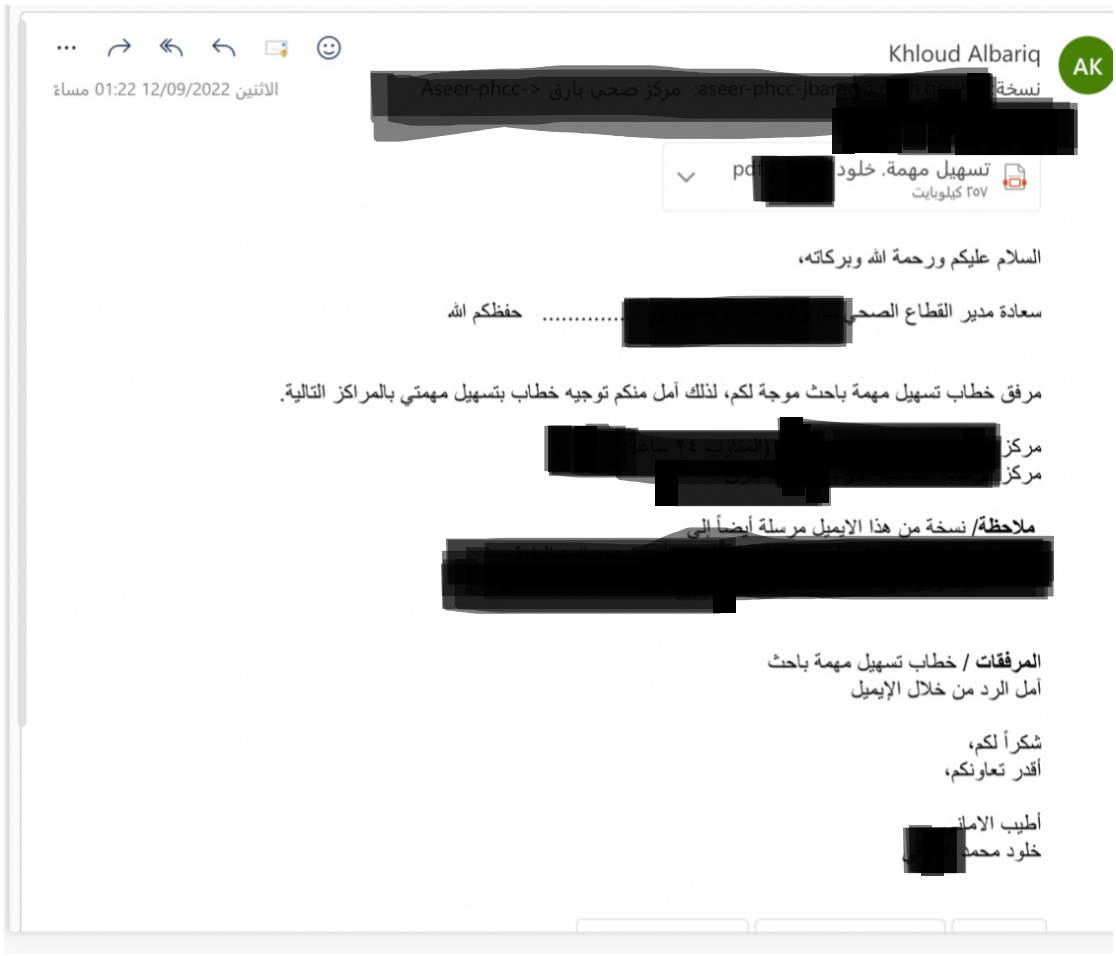
[redacted]

[redacted]

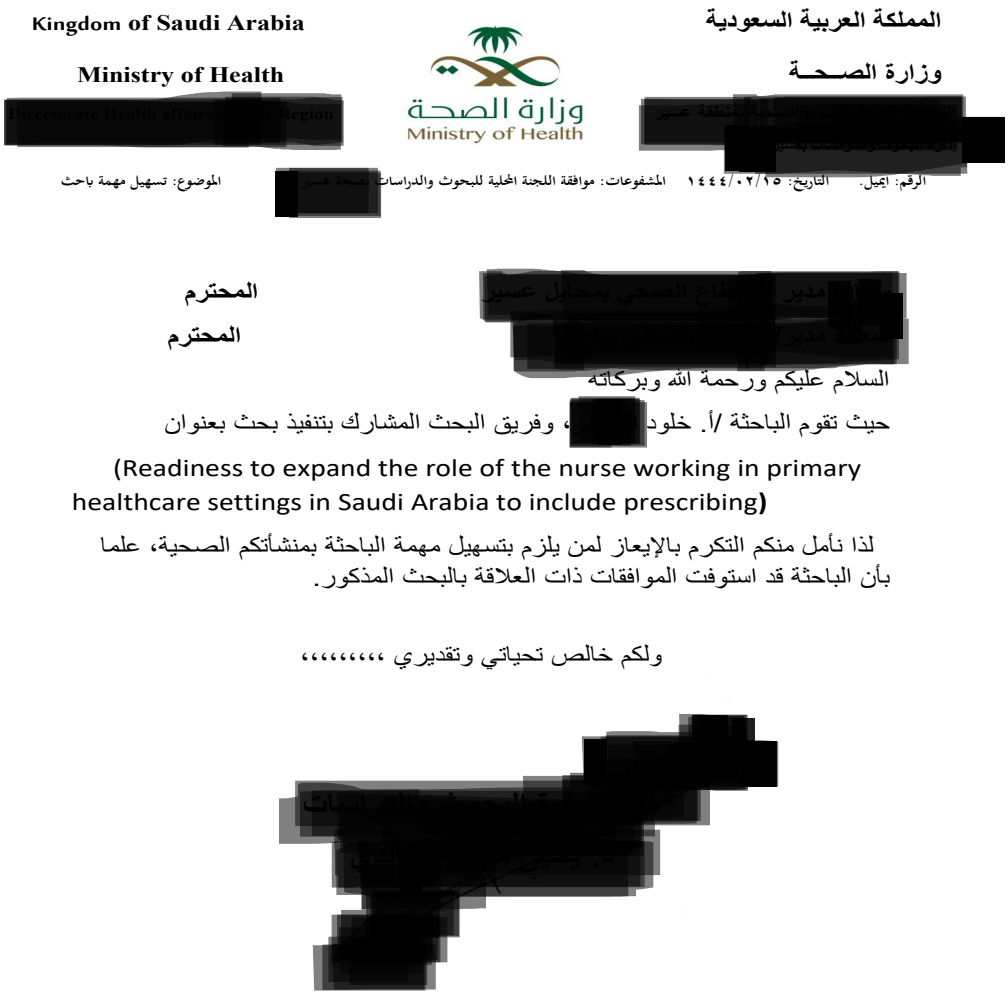
Appendix G: Email communication



Appendix H: Email communication with Southern sector healthcare centre directors



Appendix I: Facilitating the researcher's task letter



Kingdom of Saudi Arabia

Ministry of Health

[redacted]

المملكة العربية السعودية

وزارة الصحة

[redacted]

الرقم: ايميل. التاريخ: ١٤٤٤/٠٢/٢٥ المشفوعات: موافقة اللجنة المحلية للبحوث والدراسات [redacted] الموضوع: تسهيل مهمة باحث

المحترم

المحترم

[redacted]

السلام عليكم ورحمة الله وبركاته

حيث تقوم الباحثة /أ. خلود [redacted]، وفريق البحث المشارك بتنفيذ بحث بعنوان

(Readiness to expand the role of the nurse working in primary healthcare settings in Saudi Arabia to include prescribing)

لذا نأمل منكم التكرم بالإيعاز لمن يلزم بتسهيل مهمة الباحثة بمنشأتكم الصحية، علما بأن الباحثة قد استوفت الموافقات ذات العلاقة بالبحث المذكور.

ولكم خالص تحياتي وتقديري ،،،،،،،،،

[redacted]

Appendix J: Cardiff University ethical approval

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD
School of Healthcare Sciences
Ysgol y Gwyddorau Gofal Iechyd

Interim Head of School and Dean /Pennaeth yr Ysgol Dros Dro a Deon Professor David Whitaker

Cardiff University
Eastgate House
35-43 Newport Road
Cardiff
www.cardiff.ac.uk

Prifysgol Caerdydd
Ty Eastgate
35 – 43 Heol Casnewydd
Caerdydd
www.caerdydd.ac.uk

9 June 2022

Khloud Albariq
Cardiff University
School of Healthcare Sciences

Dear Khloud

Research project title: Readiness to expand the role of the nurse working in primary healthcare settings in Saudi Arabia to include prescribing

SREC reference: REC884

The School of Healthcare Sciences Research Ethics Committee reviewed the above application amendments via its proportionate review process.

Ethical Opinion
The Committee gave:

a favourable ethical opinion of the above application on the basis described in the application form, protocol and supporting documentation.

Additional approvals
This letter provides an ethical opinion only. You must not start your research project until all appropriate approvals are in place.

Amendments
Any substantial amendments to documents previously reviewed by the Committee must be submitted to the Committee via HCAREEthics@cf.ac.uk for consideration and cannot be implemented until the Committee has confirmed it is satisfied with the proposed amendments.
You are permitted to implement non-substantial amendments to the documents previously reviewed by the Committee but you must provide a copy of any updated documents to the Committee [via HCAREEthics@cf.ac.uk for its records.

Monitoring requirements
The Committee must be informed of any unexpected ethical issues or unexpected adverse events that arise during the research project e.g.

- End of project report ONLY;
- Annual reports;
- Periodic reports from and/or visits to the Chief/Principal Investigator;
- Oral updates to the Committee (by the Chief/Principal Investigator);
- Establishing a project-specific monitoring provision.

The Queen's Anniversary Prizes For Higher and Further Education 2015
INVESTORS IN PEOPLE
Athena SWAN Silver Award
QAA Cymru UK Quality Assured Sicrwydd Ansawdd y DU
Registered Charity No. 1136855
Elusen Gofrestredig Rhif. 1136855

The Committee must be informed when your research project has ended. This notification should be made to HCAREEthics@cf.ac.uk within three months of research project completion.

Complaints/Appeals
If you are dissatisfied with the decision made by the Committee, please contact Dr Kate Button, School Ethics Officer in the first instance to discuss your complaint. If this discussion does not resolve the issue, you are entitled to refer the matter to the Head of School for further consideration. The Head of School may refer the matter to the Open Research Integrity and Ethics Committee (ORIEC), where this is appropriate. Please be advised that ORIEC will not normally interfere with a decision of the Committee and is concerned only with the general principles of natural justice, reasonableness and fairness of the decision.

Please use the Committee reference number on all future correspondence.

The Committee reminds you that it is your responsibility to conduct your research project to the highest ethical standards and to keep all ethical issues arising from your research project under regular review.

You are expected to comply with Cardiff University's policies, procedures and guidance at all times, including, but not limited to, its Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data and our Research Integrity and Governance Code of Practice.

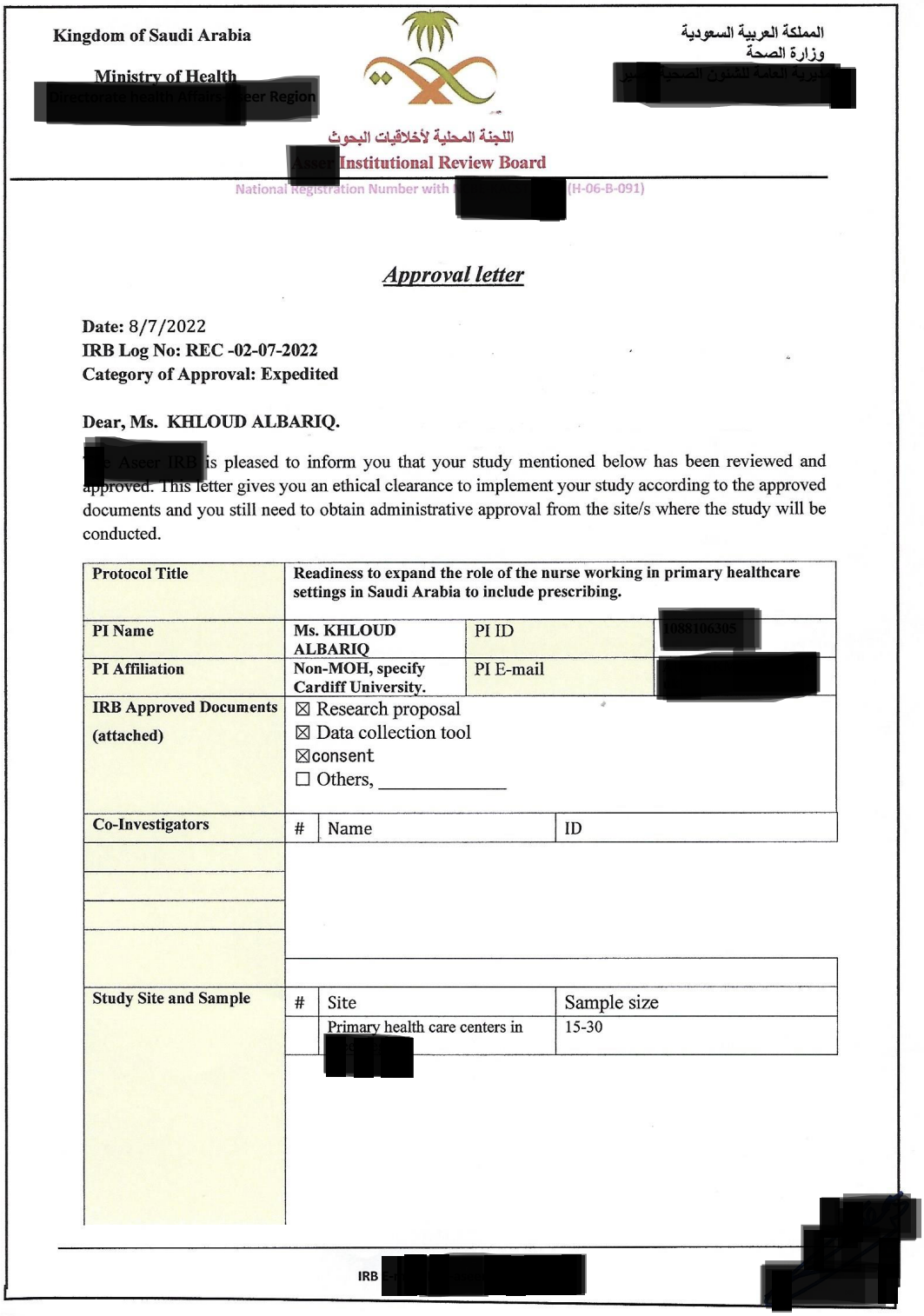
Yours sincerely,

Dr Kate Button

Cc Professor Molly Courtenay

The Queen's Anniversary Prizes 2015
INVESTORS IN PEOPLE
Athena SWAN Silver Award
QAA UK Quality Assured Sicrwydd Ansawdd y DU
Registered Charity No. 1136855
Elusen Gofrestredig Rhif. 1136855

Appendix K: Saudi Ministry of Health ethical approval



Kingdom of Saudi Arabia

Ministry of Health

[redacted]

المملكة العربية السعودية
وزارة الصحة

[redacted]

اللجنة المحلية لأخلاقيات البحوث

[redacted] Institutional Review Board

National Registration Number with [redacted] (H-06-B-091)

Approval letter

Date: 8/7/2022
IRB Log No: REC -02-07-2022
Category of Approval: Expedited

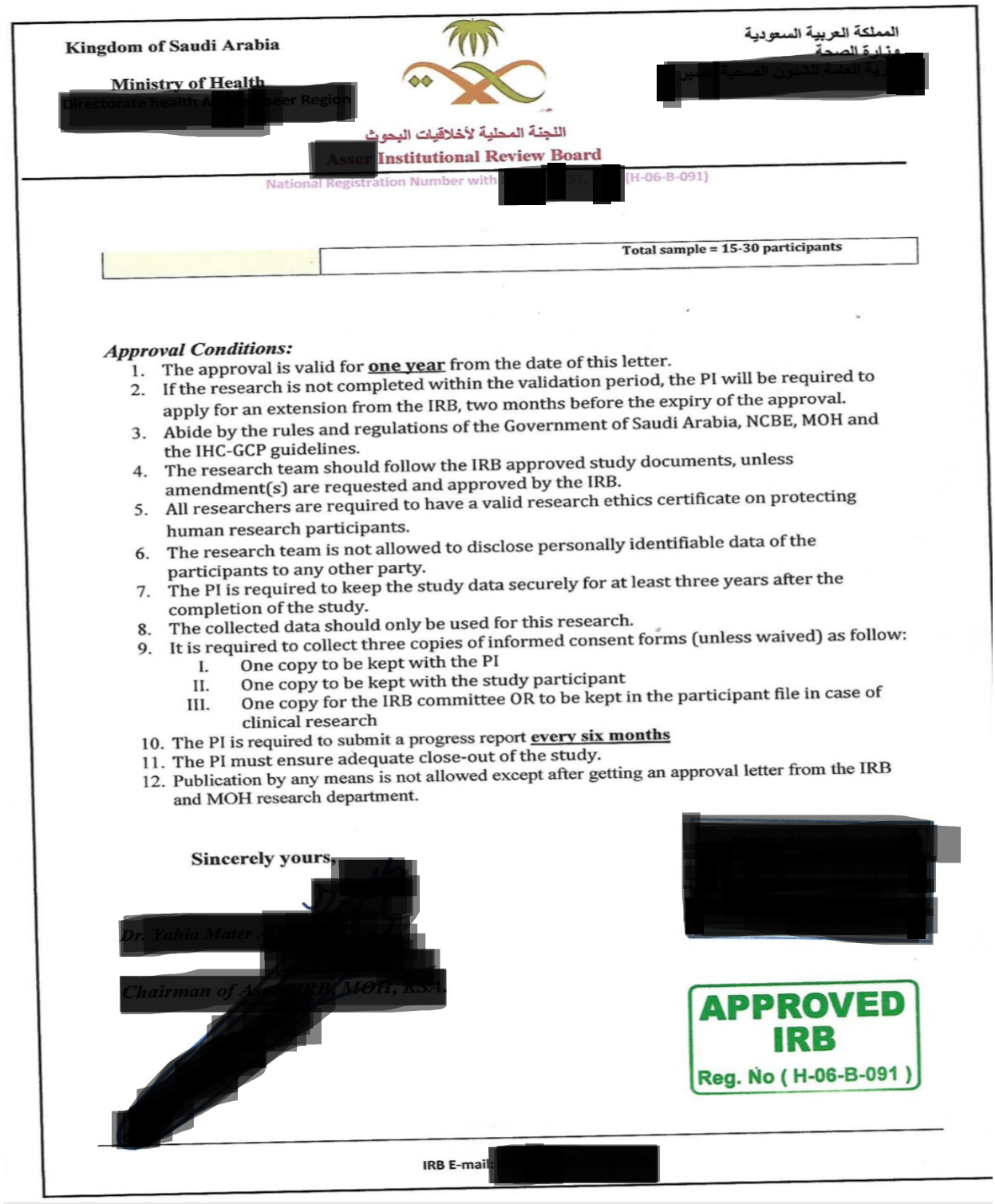
Dear, Ms. KHLOUD ALBARIQ.

[redacted] is pleased to inform you that your study mentioned below has been reviewed and approved. This letter gives you an ethical clearance to implement your study according to the approved documents and you still need to obtain administrative approval from the site/s where the study will be conducted.

Protocol Title	**Readiness to expand the role of the nurse working in primary healthcare settings in Saudi Arabia to include prescribing.**		
PI Name	**Ms. KHLOUD ALBARIQ**	PI ID	[redacted]
PI Affiliation	**Non-MOH, specify Cardiff University.**	PI E-mail	[redacted]
IRB Approved Documents (attached)	☒ Research proposal ☒ Data collection tool ☒consent ☐ Others, _____		
Co-Investigators	#	Name	ID
Study Site and Sample	#	Site	Sample size
		Primary health care centers in [redacted]	15-30

IRB [redacted]

Appendix K Continued



Kingdom of Saudi Arabia

Ministry of Health

[redacted]

المملكة العربية السعودية

وزارة الصحة

[redacted]

اللجنة المحلية لأخلاقيات البحوث

[redacted] Institutional Review Board

National Registration Number with [redacted] (H-06-B-091)

	Total sample = 15-30 participants

Approval Conditions:

1. The approval is valid for **one year** from the date of this letter.
2. If the research is not completed within the validation period, the PI will be required to apply for an extension from the IRB, two months before the expiry of the approval.
3. Abide by the rules and regulations of the Government of Saudi Arabia, NCBE, MOH and the IHC-GCP guidelines.
4. The research team should follow the IRB approved study documents, unless amendment(s) are requested and approved by the IRB.
5. All researchers are required to have a valid research ethics certificate on protecting human research participants.
6. The research team is not allowed to disclose personally identifiable data of the participants to any other party.
7. The PI is required to keep the study data securely for at least three years after the completion of the study.
8. The collected data should only be used for this research.
9. It is required to collect three copies of informed consent forms (unless waived) as follow:
   I. One copy to be kept with the PI
   II. One copy to be kept with the study participant
   III. One copy for the IRB committee OR to be kept in the participant file in case of clinical research
10. The PI is required to submit a progress report **every six months**
11. The PI must ensure adequate close-out of the study.
12. Publication by any means is not allowed except after getting an approval letter from the IRB and MOH research department.

Sincerely yours,

[redacted]

Dr. Yahia Mater [redacted]

Chairman of [redacted] IRB, MOH, KSA

[redacted]

APPROVED
IRB
Reg. No (H-06-B-091)

IRB E-mail: [redacted]

Appendix L: Cardiff University consent form

Appendix 4

Participant ID no:
Do not include box for anonymised samples

Cardiff School of Healthcare Sciences

CONSENT FORM

Title of the research project: Readiness to expand the role of the nurse working in primary healthcare settings in Saudi Arabia to include prescribing

Name of researcher: Khloud Mohmmed

Email address: AlbariqKM@cardiff.ac.uk

A Participant Consent Form is required for all study participants for ethical reasons. Please read the Participant Consent Form below. Please sign/initial boxes next to each statement (not tick/cross), then sign and date at the bottom of the form.

	Please initial box
I confirm that I have read the participant information sheet dated 03/04/2022 version 2 for the above research project. أؤكد أنني قرات نموذج معلومات المشارك المؤرخ بتاريخ 2022/04/03 الإصدار (2) لمشروع البحث أعلاه.	
I confirm that I have understood the participant information sheet dated 03/04/2022 version 2 for the above research project and that I have had the opportunity to ask questions and that these have been answered satisfactorily. أؤكد أنني على دراية تامة بما ورد في نموذج معلومات المشارك المؤرخ بتاريخ 2022/04/03 الإصدار (2) لمشروع البحث أعلاه وأنه قد أتيحت لي الفرصة لطرح الأسئلة.	
I understand that my participation is voluntary, and I am free to withdraw at any time without giving a reason and without any adverse consequences on my current role in my workplace. أفهم أن مشاركتي تطوعية، أستطيع الانسحاب في أي وقت دون إبداء سبب ودون أي عواقب سلبية على دوري الحالي في مكان عملي.	
I fully understand that I can withdraw from the study at any time until I have approved the anonymised transcript. أفهم تماماً أنه يمكنني الانسحاب من الدراسة في أي وقت حتى تتم موافقتي على نص التسجيل الصوتي لمقابلتي.	
I consent to the processing of my personal information in the consent form for the purposes explained to me. I understand that all data will be held in strict confidence and in accordance with all applicable data protection legislation. أوافق على معالجة معلوماتي الشخصية في نموذج الموافقة للأغراض الموضحة لي. أفهم أنه سيتم الاحتفاظ بجميع البيانات بسرية تامة ووفقاً لقانون حماية البيانات.	
I understand that the interview will be audio-recorded taken for the purposes research project and I understand how it will be used in the research.	

Version 1 [03/04/2022]

Appendix 4

Participant ID no: *Do not include box for anonymised samples*

أوافق على تسجيل المقابلة صوتياً لأهداف مشروع البحثي، كما أعرف كيف سيتم استخدامها في البحث.	
I understand that identifying remarks will be deleted from the transcript and I will require to review the transcript to ensure it correctly reflects my opinions and does not contain identifying information. أفهم أنه سيتم حذف المعلومات التعريفية لهوية المشارك من نص المقابلة، وسأطلب مراجعة النص للتأكد من أنه يعكس آرائي بشكل صحيح، وأنه لا يحتوي على معلومات تعريفية.	
I understand that anonymised transcript may be shared with Cardiff University supervisors. I give permission for these individuals to have access to my data. أفهم أنه قد تتم مشاركة نسخة من نص التسجيل الصوتي للمقابلة التي لا تفصح عن هويتي مع مشرفين على البحث بجامعة كارديف. وبناء على ذلك أعطي الإذن لهؤلاء الأفراد للوصول إلى بياناتي.	
I understand that anonymised excerpts and/or verbatim quotes from my interview may be used as part of the research publication. أفهم أن المقتطفات أو الاقتباسات الحرفية التي لا تفصح عن هويتي من مقابلتي يمكن استخدامها كجزء من المنشور البحثي.	
I understand how the findings of the research project will be written up and published. أفهم كيف سيتم كتابة نتائج مشروع البحث ونشرها.	
I agree that the research data will be kept for a minimum of five years in accordance with the University Records Retention Schedule. All records will be destroyed in a secure manner once the retention period has passed. أوافق على أنه سوف يتم الاحتفاظ ببيانات البحث لمدة لا تقل عن خمس سنوات وفقاً لجدول الاحتفاظ بسجلات الجامعة. سيتم أتلافها بمجرد مرور فترة الاحتفاظ.	
I agree to take part in the above study. أوافق على المشاركة في الدراسة أعلاه.	

Name of participant (print)	Date	Signature
_____	_____	
Name of person taking consent (print)	Date	Signature
_____	_____	

THANK YOU FOR PARTICIPATING IN OUR RESEARCH

YOU WILL BE GIVEN A COPY OF THIS CONSENT FORM TO KEEP

Version 1 [03/04/2022]

Appendix M: Ministry of Health consent form

نموذج الموافقة على المشاركة في بحث

أخي العزيز/أختي العزيزة: ----------السلام عليكم ورحمة الله وبركاته

أنت مدعو من قبل فريق هذا البحث الموسوم بـ (الاستعداد لامتداد دور التمريض ليشمل وصف الأدوية في مراكز الرعاية الصحية الأولية في المملكة العربية السعودية).

والذي يتلخص فيما يلي (هدف البحث والإجراءات التي تعمل للمشارك)

هناك ندرة في الأبحاث المنشورة حول امتداد دور التمريض ليشمل وصف الأدوية في مراكز الرعاية الصحية الأولية السعودية، بالرغم من أن الأدبيات تدعم أهمية تضمين وصف الأدوية ضمن الممارسة التمريضية في مراكز الرعاية الصحية الأولية في المملكة العربية السعودية، لضمان حصول المرضى على الأدوية والرعاية التمريضية الشاملة في الوقت المناسب؛ لذلك، من الضروري معرفة آراء كادر التمريض ومشرفي التمريض ومدراء مراكز الرعاية الصحية الأولية وصانعي السياسات في مهنة التمريض حول امتداد دور التمريض ليشمل وصف الأدوية، ومعرفة العوامل التي تؤثر على امتداد دور التمريض في السياق السعودي.

تهدف هذه الدراسة إلى استكشاف الاستعداد لامتداد دور التمريض في مراكز الرعاية الصحية الأولية في المملكة العربية السعودية ليشمل وصف الأدوية، وذلك من خلال معرفة.

- الآراء حول امتداد دور التمريض ليشمل وصف الادوية.
- العوامل التي قد تسهم في تمكين التمريض من وصف الأدوية بالإضافة الى العوامل التي قد تعيق اعتماد دور وصف الأدوية لتمريض في مراكز الرعاية الصحية الأولية.
- التغييرات اللازمة لتمكين التمريض من وصف الأدوية.

مشاركتك في هذه الدراسة ذات قيمة لأنك قادر على تقديم المعلومات ذات الصلة كممرض/ة، مدير/ة، مشرف/ة تمريض أو صانع/ة سياسات والتي سوف تسهم في معرفة الآراء حول امتداد ممارسة التمريض لتشمل وصف الأدوية في مراكز الرعاية الصحية الأولية في المملكة العربية السعودية. عندما توافق على المشاركة في أجراء مقابلة مع الباحثة، سوف يطلب منك التوقيع للموافقة على المشاركة، وستقوم الباحثة بترتيب وقت ومكان مناسبين لأجراء المقابلة. يمكنك اختيار أجراء المقابلة وجهاً لوجه أو عبر تطبيق زوم إذا كنت تفضل ذلك. سوف تستغرق المقابلة ما بين ٣٠ الى ٦٠ دقيقة، سوف يتم تسجيل المقابلة صوتياً. سوف يتم نسخ التسجيلات الصوتية وإخفاء هويتك قبل تحليلها، ويمكنك طلب نسخة من المقابلة.

لذا نأمل منك المشاركة في هذا البحث علما بأن:

١-مشاركتك هي مشاركة طوعية واختيارية

٢-يمكنك الانسحاب من البحث متى أردت ويمكنك أيضا رفض الاجابة عن الأسئلة التي لا ترغب في الاجابة عليها، أو رفض أي إجراء آخر دون أن يترتب على ذلك الاخلال بحق من حقوقك أو فقدان أي منفعة تقدم لك من خلال المنشأة الصحية.

٣- يضمن لك فريق البحث بأن هذه المعلومات ستعامل بكل سرية ولن تستخدم لأي أغراض أخرى عدا تحقيق أهداف هذا البحث.

اسم وتوقيع الباحث الرئيسي: خلود محمد

رقم الهاتف:

اسم وتوقيع المشارك:

رقم الهاتف:

Appendix N: Participant Information Sheet

PARTICIPANT INFORMATION SHEET

Title of the research project:

Readiness to expand the role of the nurse working in primary healthcare settings in Saudi Arabia to include prescribing

Invitation

My name is Khloud Mohmmed Albariq, I am a PhD student at the School of Healthcare Sciences, Cardiff University in the UK. It would be my pleasure to invite you to participate in a study to explore readiness to expand nursing practice to include the prescribing role in primary healthcare settings in Saudi Arabia. This will involve an exploration of the views of nurses, managers, nurse supervisors and policymakers. To decide whether to participate, you should understand the reasons for the study and what your participation might entail. In this information sheet, you will find detailed information about the study so you can decide whether or not you wish to participate. It is important that you read the sheet carefully before making your decision. Please do not hesitate to contact me if you have any questions or if you need further information regarding the research.

What is the purpose of this research project?

Research about expanding the role of nurses to become prescribers in Saudi primary healthcare settings is lacking, despite literature suggesting prescribing should be integrated into nursing practice in primary healthcare settings in Saudi Arabia to ensure timely access to medications and comprehensive care (Hibbert et al, 2017). Therefore, in extending a paradigm shift to include prescribing medication, it is imperative to consider the perspectives of stakeholders (nurses, nursing supervisors, managers, and policymakers) within the nursing profession, especially in Saudi Arabia where preexisting theories about factors influencing the expansion of nursing practice roles have been lacking.

This study, therefore, **aims** to explore readiness to expand the role of the nurse working in primary healthcare settings in Saudi Arabia to include prescribing.

By exploring at macro (policymakers), meso (nursing supervisors and managers) and micro-levels (nurses):

- The views of nurses adopting the prescribing role
- Barriers and facilitators to the adoption and implementation of the nurse prescribing role
- The changes required to expand nurse practice to include the prescribing role.

The participants in the study will be selected based on their ability to meet set inclusion criteria, alongside a willingness to participate.

The inclusion criteria will be as follows:

- Registered senior nursing technicians, nurse specialists and senior nursing specialists (males and females who have at least one year's experience), working in primary healthcare settings. They will be able to share valuable insights based on their own experience.
- Nursing supervisors and managers (males and females) who have at least one year's experience working in primary healthcare settings, regardless of their educational qualifications, as they can still provide valuable insights based on their experience in managerial positions.
- Policymakers (males and females) (senior nursing specialists and nursing consultants) who have at least one year's experience in developing policies, as their expertise is invaluable.

The exclusion criteria will be as follows:

- Unregistered nurses (students), nursing assistants, nursing technicians and nurses who have less than one year's experience in primary healthcare settings will be excluded.
- Nursing supervisors, managers and policymakers who have been in their positions less than one year will be excluded.

Why have I been invited to take part?

Your participation in this study is valuable. This is because you are able to provide relevant information as a nurse, manager, nursing supervisor, or policymaker. Your participation will help to understand the perspectives about developing the role of the primary healthcare nurse to include prescribing.

Do I have to take part?

You are not required to participate in the interview. Participation is entirely voluntary. If you decide not to participate now or in the future, it will not have an impact on your work as a nurse, manager, nursing supervisor, or policymaker. You must provide written informed consent if you choose to take part. You can withdraw from the study at any time, even after you have signed the consent form, without giving a reason.

What will taking part involve?

You will be able to discuss the information you have been given with the researcher to make sure that you are fully aware of the study's aims and objectives. When you agree to participate, you will be asked to sign a consent form, and the researcher will arrange a suitable time and place to conduct an interview. The interview will last between 30 minutes and an hour. A semi-structured interview will be conducted, which will be audio-recorded. You can choose to be interviewed via a Zoom meeting or face-to-face if you prefer. You can ask the interviewer to pause the recording as well as stop it during the interview. Audio recordings will be transcribed and anonymised before being analysed, and you can request a copy of the anonymised transcript.

Will I be paid for taking part?

You will not receive any financial benefit from any data you provide.

What are the possible benefits of taking part?

The participants have no immediate advantages from participating in the project, but the information they provide will assist in the development of a new contribution to Saudi literature.

What are the possible risks of taking part?

You are unlikely to experience any significant risks or disadvantages. If you feel distress, the researcher will pause the audio-recording and provide support. You can withdraw without giving a reason before or during the interview. The data can be withdrawn two weeks after the interview.

Will my taking part in this research project be kept confidential?

The information provided will be treated in strict confidence. There will be no identifying information in any reports or publications. It will also be impossible to identify your workplace. Audio recordings will be transcribed. The transcripts will be anonymised so that you cannot be identified from the information the researcher collects. Cardiff University will securely store audio recordings during the study. Records will be destroyed at the end of the study. According to Cardiff University policy, anonymised transcripts will be kept for 5 years and then destroyed. Subsequently, the results will be published in journals and presented at conferences. Anonymised verbatim quotes will be used. Once the PhD thesis has been completed, the thesis will be submitted to Cardiff University.

For the purpose of analysis and verification, Professor Molly Courtenay and Dr. Clare Hawker may have access to anonymised transcripts. Arabic anonymised transcripts may be shared with transcription services. Publishers may be able to accessthe data for publishing purposes. All personal information will be removed before giving supervisors access to your data.

What will happen to my personal data?

All collected data, such as your name, email address, phone number and Zoom ID, will be kept safe and stored according to Cardiff University guidelines. Cardiff university is obligated to protect your personal data in accordance with Data Protection legislation. You can learn more about your rights, how Cardiff University uses your personal data for research, and how you can contact Cardiff University's Data Protection Officer, as well as the Information Commissioner. Find out more at https://www.cardiff.ac.uk/public-information/policies-and-procedures/data-protection.

You can also order printed copies of the above documents and privacy notices.

The interview will be anonymised except for your consent form. According to University Records Retention Schedule, consent forms will be kept for five years and can be accessed by supervisors. In accordance with the University Records Retention Schedule, anonymised information will be kept for five years but may be published or retained indefinitely if it continues to be useful for research. Once anonymised data has been published, it cannot be withdrawn. Identifiable personal information (name and contact details) will be kept securely for less than one year.

What happens to the data at the end of the research project?

All information is confidential. Your name and location will never be disclosed. The information will be stored on a data management system, which is password protected. Only the researcher and supervisor will have access. Identifiable information will not appear on the final report. Data from this study have to be retained for 5 years by Cardiff University. The data will finally be destroyed after 5 years.

What will happen to the results of the research project?

A PhD thesis, a publication in a journal, and a presentation at a conference will be the outcome of this study. There will be no identifying information on participants in any report, publication, or presentation, but verbatim quotes will be used. Please let the researcher know if you want a copy of the findings.

What if there is a problem?

Please contact Professor Molly Courtenay at CourtenayM@cardiff.ac.uk and Doctor Clare Hawker at HawkerCL@cardiff.ac.uk with any concerns or complaints during this project. For formal complaints, please contact Dr. Kate Button Director of Research Governance via email at Buttonk@cardiff.ac.uk or by telephone on +44(0)29 20 687734, School of Healthcare Sciences, College of Biomedical and Life Sciences, Cardiff University, Room 13.17, 13th Floor, Eastgate House, 35 - 43 Newport Road, Cardiff, CF24 0AB.

Who is organising and funding this research project?

This research project has been organised by the School of Healthcare Sciences at Cardiff University. Our research team is composed of Professor Molly Courtenay, Doctor Clare Hawker, and Khloud Mohmmed Albariq, a PhD student. The research is sponsored by the Saudi Ministry of Higher Education.

Who has reviewed this research project?

The School of Healthcare Sciences Research Ethics Committee at Cardiff University has reviewed this study.

Further information and contact details

If you decide to participate, the researcher will arrange an interview at a time that's convenient for you. No further action is required if you do not wish to participate. Please contact Khloud Mohmmed Albariq postgraduate researcher if you have any questions about this research project: by email at AlbariqKM@cardiff.ac.uk or phone number [redacted].

Thank you for considering taking part in this research project. If you decide to participate, you will be given a copy of the Participant Information Sheet and a signed consent form to keep for your records.

Appendix O: Interview Schedule

Research Title: Readiness to expand the role of the nurse working in primary healthcare centres in Saudi Arabia to include prescribing

Nurse, nursing supervisor, manager, and policymaker Details about the interview

- Interviewer:
- Identification number:
- Place of the interview:
- Duration of the interview:
- Data of interview:
- Time of interview:
- List of acronyms:

Background information

- Age:
- Gender:
- Nationality:
- Educational level:
- Year of experience:
- Specialty:
- Job title:

Exploratory questions (Key questions)

1-Views about NP: What do you think about expanding your / or nurses practice to include prescribing in primary healthcare settings?

Nurses
- What do you feel about the idea of becoming a nurse prescriber?
- What benefits do you think expanding your practice to include prescribing could bring to your patients?
- How do you think prescribing role could enhance your role and professional development as a nurse?
- Do you think it (nurse prescribing) will benefit other healthcare professionals?
- In your opinion, how could nurse prescribing be implemented in your practice?

Nursing Supervisors
- What is your perspective on nurses taking on prescribing roles in primary healthcare centres?
- What organisational benefits do you anticipate from nurse prescribing role?
- What do you think are the potential benefits of nurse prescribing for patient care?
- What do you think would be the most effective way to implement nurse prescribing in primary healthcare settings?

Managers
- What is your perspective on nurses taking on prescribing roles in primary healthcare centres?
- What organisational benefits do you anticipate from nurse prescribing role?
- What do you think are the potential benefits of nurse prescribing for patient care?

- What do you think would be the most effective way to implement nurse prescribing in primary healthcare settings?

Policymakers (Macro-level)
- How do you see nurse prescribing contributing to the broader goals of healthcare system in Saudi Arabia?
- What do you think are the potential benefits of nurse prescribing to primary healthcare services?
- What do you think are the potential benefits of nurse prescribing to patients?
- What do you think would be the most effective way to implement nurse prescribing in primary healthcare settings?

2-Barriers and facilitators to NP: In your opinion, what are factors that may hinder and help you/ or nurses to become a prescriber?

Nurses (Micro-level)
- What do you think are challenges you might face in becoming a nurse prescriber?
- Do you feel that your current nursing education has provided you with a strong foundation for becoming a prescriber? Why or why not?
- Are there any specific skills or knowledge areas that you feel would require further development for you to prescribe medications effectively?
-What kind of education do you think would best prepare you for the prescribing role?
-What obstacles do you think you will have in accessing educational training to prepare them for prescribing roles?
- Do you believe nurses are ready to accept prescribing responsibilities? Why or why not?
- What factors might influence your willingness or confidence to accept a prescribing role?
- How do you think patients will perceive nurses taking on prescribing roles?
- Do you anticipate any challenges in gaining the trust of patients as a nurse prescriber ?
3. How do you think doctors and other medical professionals will respond to nurses prescribing medication?
4. What strategies do you think could help improve acceptance of nurse prescribing among patients and healthcare professionals?

Nursing Supervisors (Meso-level)
- What barriers do you think nurses face in becoming prescribers?
- Are there organisational challenges that might hinder nurses from taking on prescribing roles?
- Do you think existing nursing education programs adequately prepare nurses to become prescribers? Why or why not?
- What kind of educational preparation do you think nurses need to take on a prescribing role effectively?
- How do you think nursing supervisors can support nurses during their educational journey to become prescribers?
- Are there any barriers within the organisation that might prevent nurses from obtaining the necessary educational preparation for prescribing?
-To what extent do you think nurses in your organisation are open to accepting prescribing roles?
- How do you think patients will react to nurses taking on prescribing responsibilities?
- How do you think the attitudes of other healthcare professionals might impact nurses' ability to prescribe medications?
- What role do you think nursing supervisors can play in fostering acceptance of nurse prescribing among healthcare teams and patients?

Managers (Meso-level)
- What organisational barriers do you anticipate in implementing nurse prescribing in primary healthcare settings?
- Do you think the current nursing education system is sufficient to prepare nurses for prescribing? Why or why not?

- What educational frameworks do you think should be in place to prepare nurses for prescribing roles?
-What obstacles do you think nurses will have in accessing educational training to prepare them for prescribing roles?
- How do you think organisations can support nurses in accessing the education and training needed for prescribing?
- Are there any barriers within the organisation that might prevent nurses from obtaining the necessary educational preparation for prescribing?
- What role do you see managers playing in ensuring nurses receive adequate educational preparation for prescribing?
- How do you perceive the level of acceptance among nurses for taking on prescribing responsibilities?
- What organisational factors might influence nurses' willingness to accept prescribing roles?
- How can managers at organisational level encourage nurses to embrace prescribing responsibilities while addressing any resistance?
- Are there any cultural or professional challenges that might make it difficult for nurses to take on prescribing roles?
- What role do you think managers at organisational level can play in fostering acceptance of nurse prescribing among healthcare teams and patients?

Policymakers (Macro-level)
- What regulatory or policy barriers might hinder the implementation of nurse prescribing in primary healthcare settings?
- Do you think the current nursing education system is sufficient to prepare nurses for prescribing role? Why or why not?
- What cultural, social, or professional factors do you think might influence acceptance of nurse prescribing?
- What are your thoughts on how patients might respond to nurses in prescribing roles?
- How do you think medical professionals, will perceive the expansion of nurse prescribing?
- At national level, how can we ensure that nurse prescribing is widely understood and accepted as an effective practice?

3-Changes: In your opinion, what changes in practice are needed to help you/ or nurses to become a prescriber?

Nurses (Micro-level)

- What changes do you think could enhance the implementation of prescribing roles in your practice?
- How ready do you think your organisation is to implement nurse prescribing?
- What kind of support do you expect at the organisational level as nurse prescriber ?
- What do you think can be done to ensure prescribing practices remain safe and effective?

Nursing Supervisors (Meso-level)
- What changes do you think are needed in PHC organisation to implement nurse prescribing effectively?
- What infrastructure or organisational readiness factors do you think are essential for the implementation of nurse prescribing roles?
- How do you think your role as nursing supervisors would need to change to implement nurse prescribing?
How do you think nurses can be supported effectively at organisational level in their roles in prescribing?
How can safe and effective nurse prescribing be ensured?

Managers (Meso-level)
- What organisational changes do you think are needed to implement nurse prescribing?
- How ready do you think your organisation is to implement nurse prescribing?

- How do you think workflows would need to be adjusted to accommodate nurse prescribing role?
- How do you think nurses can be supported effectively at organisational level in their roles in prescribing?
- How can safe and effective nurse prescribing be ensured?

Policymakers (Macro-level)

- How do you think policy and regulatory frameworks could evolve to implement nurse prescribing at the national level in Saudi Arabia?
- What factors should be considered at the policy level to help organisations prepare for the implementation of nurse prescribing on a national level?
-In your opinion, what role could legislative adjustments play in ensuring nurses prescribe safely and effectively?

Closing question

Thank you again for your participation in this conversation, do you want to add anything to our discussion?

Version (4) **28/05/202**

Appendix P: Table 4 (Descriptive coding and in-vivo coding).

Descriptive **Coding**	**Extracts**
Descriptive codes	
Limited experience and knowledge **Unprepared leadership**	I mean, I have five years of experience. My role involved giving medications, not prescribing medications. From my point of view, I feel that I have only limited experience. To prescribe medications, I must know the diagnosis the condition, and the history of a patient(N8). Possible there is a barrier at the organisational level that is the lack of readiness of the nursing leadership to direct this task of prescribing medications (N 4).
PHC readiness	When nurses pass programs, it is imperative that they prepare the internal environment to achieve results and goals in serving patients is met (M 3).
Limited medication	Not all medications should be prescribed (N9).
Training duration	Programme could be at least three months long (M1).
Lack of time to study	For qualification, the administration, they may not allow and free me from work, this is considered a pre-qualification obstacle. It is my right, as a nurse, to be allowed and free to develop and learn at any time(N9).
In-vivo codes	
Change job title	There is also a need to **change the job title,** so that nursing will be supported, along with the salary, which will be completely different from those nurses who do not prescribe medications (M 3).
Lack of prescribing programme	There are barriers to implementing nurse prescribing of medications. It might be due to a **lack of prescribing programme** (M 4).
Doctor resistance	**Doctor resistance** may happen, and we will need to put a great deal of effort into making these programs work, or at least start to work. The first resistance comes from doctors (P 4).
Financial benefits	There is a need to have **financial benefits** to accept prescribing role (N 4).
Increasing workload.	There is a great deal of work and extra tasks, so there is no capacity to **increasing workload** (M 2).

Appendix P Continued

Interpretive Coding	Extracts
Latent codes	
Partnership prescribing	The best way to discuss medications for new cases is with a doctor. After the diagnosis has been made, we will decide what to do next (N 6).
Re-prescriptions more accepted	I currently work in a chronic disease clinic. The patients visit the clinic every month. They have been taking the same medications for over five and six years. I know them and they know me. My patients sometimes ask me to write a prescription so they can leave without waiting for a doctor (N 1).
Legal protection	There is a risk of patients attacking them when they prescribe medication (NS1).
Pilot implementation	It is critical to test the flow of prescribing practices in practice before introducing them into PHC to assess their feasibility (P 3).
Job description	To ensure that nurses can prescribe independently, there must be guidelines that support prescribing practice (M4).
Pattern codes **Category** **Areas of prescribing role** • **Chronic diseases clinics** • **Maternity clinic** • **Vaccination** • **General clinics**	Nurses will be able to prescribe medication for chronic diseases in stable conditions, so I work with them along with my doctor (N10). In maternity clinic, nurse know their pregnant women medications because they are limited (N 3). Nurse can prescribe in the vaccination clinic (M 5). I see that in general clinics it is possible to prescribe common general medications that do not have any risks (NS 1)
Category **Lack of patient acceptability** • **Patients confident in nurses** • **Lack of patient confident** • **Doctors prefer to prescribe medications** • **Gaining patient confident**	There are some patients who will not be concerned, they will be confident in the skills of the nurses(N4). A patient's lack of confidence in the nurse's ability to prescribe treatment may be a definite obstacle (N 6) It is possible that patients will initially prefer the doctor to the nurse (N 1) It is important for nurses to be present when the doctor examines the patient and to be familiar with the case before by sharing in putting treatment plan for patient with doctor, they are confronted with it for the first time. This way, the service recipients will feel confident (M 1).
Category **Contribution to PHC service** • **Enhancing accessibility** • **Reduced patient complaints** • **Managing doctor shortage** • **Reducing waiting time**	Healthcare centers might need this role to enhance access to healthcare service (M 5). Sometime patients' complaints from delaying access, this may alleviate the problem of patient's complaints(M5) Having nurses prescribe medications will manage the problem of doctor shortage (N 7) I mean, for example, it is possible to reduce the time that patients take to wait for doctors, so we reduce the waiting period, and this is considered an improvement project in obtaining the medications (M1)

Appendix Q: Table 5 (Final report for developed themes)

Research questions	Themes	Sub-themes	Participants quotations
What are the perspectives at the macro-level(policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses) regarding the introducing role of nurse prescribers in Saudi Arabian primary healthcare centres?	**Improving primary healthcare services** This theme refers to how the introduction of the nurse prescribing role was perceived to have the potential to improve primary healthcare services by increasing accessibility to services and reduce waiting times.	**Sub-theme 1** **Increasing accessibility**	"*I expect that it [nurse prescribing] will contribute very significantly to helping primary healthcare centres to improve their services by increasing accessibility to healthcare service for service users [patients]*" *(P1).* "*Patients will be able to access care if the nurses can extend their services … This will increase access to healthcare services*" *(M2).* "*…it is possible to benefit patients through increasing access to services where they receive their medication from nurses*" *(N5).* "*Primary healthcare centres are currently facing challenges concerning a shortage of doctors …. This causes delays for patients accessing healthcare: allowing nurses to prescribe medication will increase patient access to healthcare*" *(M1).* "*The shortage of doctors is a permanent obstacle in healthcare centres that reasons a delay in obtaining medication for the patient…. Nurse who can expand their practice and prescribe medication can definitely help to increase access to healthcare services*" *(NS2).* "*Nurses will be available … for patients so that it does not take the patient more than a day or two to find a doctor before accessing medications…. A patient can come at any time during the day and access the service*" *(N3).*
		Sub-theme 2 **Reduced waiting times**	"*We can improve service levels by reducing the average waiting period for patients: if a nurse can be found competent to prescribe medications, this will shorten the waiting period for patients in primary healthcare centres*" *(P4).* "*Nursing professionals play an important role in improving patient services … I think we can gain benefit from nurses' skills and reduce patients' waiting time*" *(M5).* *"Waiting time will be reduced…Instead of waiting for half an hour to receive their medications, they will only have to wait 5 or 10 minutes to wait" (N 7).* "*Patients would not need to see the family medicine doctor; instead, their pathway will be stopped at the* clinic, *where nurses can prescribe their medications, and they can return home immediately. No more procedures … or waiting will be required*" *(P4).* "*I can prescribe their medications in the same clinic without needing to increase the wait time for patients … Their pathway will not require them to visit a doctor*" *(N1)*

Appendix Q Continued

Research questions	Themes	Sub-themes	Participants quotations
What are the perspectives at the macro-level(policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses) regarding the introducing role of nurse prescribers in Saudi Arabian primary healthcare centres?	**Nurse-doctor partnership prescribing** This theme discusses how the nurse prescribing role could be implemented as a partnership between nurses and doctors. Additionally, this theme discusses how prescribing in partnership could be implemented in chronic disease clinics and maternity clinics		"*I think that only doctors should make the initial diagnosis …. The nurses can be involved in the decision regarding the appropriate treatment options for patients*" *(P4).* "*The doctor must first diagnose and evaluate a patient's condition, and then work with the nurse to develop a treatment plan that includes the patient's medication*" *(M2).* "*The most effective way to discuss medications in newly diagnosed cases is with a doctor. After the diagnosis is made by the doctor, we [doctor and nurse] can decide what to do next about medications*" *(N6).* "*In chronic disease clinics, the nurse and doctor can share the responsibility of managing patients' conditions. Patients' treatment plans can be developed by them [nurse and doctor]. Patients can then be followed up by nurse prescriber*" *(P5).* "*I can prescribe medication for chronic diseases, but I will need to work with doctors to diagnose patients, and then I'll lead the follow-up visits for patients*" *(N10).* "*For Chronic diseases … Nurses may need to work with the doctor in developing the patients' treatment plans …. They [nurses] can follow up patients and prescribe medication after each patient has received a diagnosis and treatment plan*" *(M2).* "*The first clinic where the nurse can prescribe medications is the vaccination clinic, because most children after vaccination need paracetamol … The nurse can provide the vaccination and prescribe paracetamol independently*" *(P4).* "*In the vaccination clinic… paracetamol is usually prescribed for children after receiving the vaccine. So instead of going to a doctor, a nurse can evaluate the child's condition. If the child is healthy and does not have any problems … they [nurses] give the vaccination and prescribe medication at the same time*" *(NS1).* "*Vaccination clinics are also possible because paracetamol would be prescribed after vaccination without need to work with doctor [prescribing partnership]" (N9).*

Appendix Q Continued

Research questions	Themes	Sub-themes	Participants quotations
What are the facilitators of, and barriers to, nurse prescribing role in Saudi primary healthcare centres from the perspectives of macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses)?	**Educational preparation** This theme refers to the need for educational preparation for the introduction of nurse prescribers. These are related to the need to study pharmacology and diagnosis, determining an education pathway and clarifying entry requirements for nurse prescribing programmes.	**Sub-theme 1** **The need to study pharmacology and medical diagnosis**	"*They [nurses] need to study pharmacology extensively and not at the same level as undergraduates ... They need to study all the medication families as they may deal with patients with multiple diseases …. They need to study the medications associated with body systems and disease*" *(P2).* "*I mean comprehensively studying all of the medication's families, side effects and dosages. When a patient has more than one chronic disease, I need to know the medications that are contraindicated in the patient's diseases, the medications that the patient can use, and which medications are appropriate for the patient …. A detailed discussion of medications for different parts of the body and diseases should also be studied*" *(N9).* "*Learning everything about medications is needed ... The most effective way to take the medication, the interactions between medications, and contradictions in relation to the patient's diseases" (NS2).* "*The ability to diagnose patients may be challenging for me ... All of these require knowledge and skills in diagnosing, which I am lacking. I need to study how to diagnose the patient from the very beginning. How can I take the patient's medical history to avoid prescribing medications that conflict with their medical condition?*" *(N3).* "*In my opinion, if there is something that can prevent the nurses from prescribing medication, is a lack of knowledge about diagnosing and doing a physical assessment …. They need to study and dig deep into the diagnosis*" *(NS2).* "*I do not think nurses able to diagnosis patients …. How will the nurse be able to diagnose the patient? They need to learn to do physical assessments along with assessing the patient's medical history to understand the patient's overall health*" *(P5).*
		Sub-theme 2 **Determining educational level**	"*Educational pathways[level] that prepare nurses effectively with knowledge and skills, as well as ensuring that nurses are competent in this role [nurse prescribing role], need to be determined*" *(N7).* "*Determining the appropriate educational pathway [level], a degree, or programme for a prescribing role, … like nurse practitioners in the United States, Canada or nurse prescribers in the United Kingdom*" *(P1).* "*We do not yet have clear educational preparation in Saudi Arabia to qualify nurses specifically for a prescribing role … Defining an educational pathway for a prescribing role is needed*" *(M5).*
		Sub-theme 3 **Clarifying educational requirements**	"*Legislators need to clarify what level of experience is required to access prescribing programmes*" *(N10).* "*The requirement for experience needs to be clarified. For example, candidates need 3 years of nursing experience before applying*" *(P5).* "*The first thing we need to know is what level of experience nurses should have before getting access to education for the role, I think this needs to be clarified" (M5).* "*Can we start with a bachelor's degree or higher? Is it normal to start with a diploma? Only the ministry can clarify this*" *(N5).* "*For example, a diploma, no, a bachelor's, no, I mean the educational level needs to be clarified*" *(N3).*

Appendix Q Continued

Research questions	Themes	Sub-themes	Participants quotations
What are the facilitators of, and barriers to, nurse prescribing role in Saudi primary healthcare centres from the perspectives of macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses)?	**Acceptability of the nurse prescribing role** This theme refers to the barriers and facilitators that may influence patients, doctors, and nurses' acceptance of the nurse prescribing role in Saudi primary healthcare centres.		"*The major obstacle would be from patients, who may not accept it …. Patients are accustomed to receiving medication from doctors rather than from nurses … Currently only a doctor is responsible for prescribing*" *(P4).* "*Considering the traditional views and perspectives of society with regard to understanding this role … some patients may not accept the idea …. Patients may not allow nurses to diagnose or to prescribe medication for them as they are used to doctors doing it*" *(NS3).* "*Patients will not accept this role [nurse prescribing role] …. Patients are understanding that prescribing is doctor responsible only" (N3).*"*Lack of sharing prescribing role with nurse by doctor would be a barrier. Doctor roles are limited and simple in health centres. If the nurse fulfils the same role and provides the same service … All of the patients will be handled by three nurses without a doctor, and the doctor will not accept" (NS5).* "*Some doctors may oppose the role because they feel that I can fulfil their role functionally and that their role is no longer needed, and this would be an obstacle*" *(N7).* "*Nurses have many responsibilities and extra tasks, and so there is no capacity to increase workload and have additional prescribing responsibility*" *(M2).* "*Having both nursing responsibilities and prescribing medications would be a challenge for me. Adding the responsibility of prescribing medications to a nurse's already heavy workload … it may expose nurses to legal responsibilities if something goes wrong … this can be difficult to accept*" *(N2). "Most centers require nurses to fulfill both their nursing responsibilities as well as other extra tasks …. Nurses may not accept prescribing role" (NS5).*

Appendix Q Continued

Research questions	Themes	Sub-themes	Participants quotations
What potential changes are required to introduce the NP role in Saudi primary healthcare centres from the perspective of the macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses)?	**Establishing the legality of nursing prescribing practice** This theme refers to changes that are needed to establish the legality of nursing prescribing practice. These are related to **legislation and regulations,** and licensed nursing prescribing practice.	**Sub-theme 1** **Legislation and regulations**	*"There must be enacted legislations that allow nurses to prescribe medicines legally" (M3). "From a legal perspective, there is a need for clear legislations that give them [nurses] the legal authority to prescribe medications for their patients" (NS5). "The first step is to have laws [legislation] that make explicit the nurse's authority to prescribe medications" (N10).* *"A Ministry of Health may be able to learn from those countries which have nurse prescribers, and this may make it easier to formulate the most appropriate regulations" (N10)."We need to do our homework and find out from the countries that have implemented nurse prescribing what they had to do to make the right regulation at all levels ... from the clinical level to the administrative level" (P2)."It is necessary to learn from other countries that have implemented it" (NS2).*
		Sub-theme 2 **Licensed nursing prescribing practice**	*"A clear definition of the nurse licensing process is needed .... If they [nurses] meet the requirements for licensed prescribing practice .... They are legally able to prescribe medications" (P 1). "For them [nurses] to practise their speciality [nurse prescribing in their area of competency] ... They must obtain licences .... They must meet licensing requirements before starting prescribing practice to legally prescribe" (M 4). "Requirements to obtain licenses need to be defined. Only nurses who meet licensure requirements would be able to prescribe, because they are legally authorised to initiate their prescribing practice" (N 3). "I think we may need to renew our licence in prescribing, we may renew it through a test or maybe through attending courses or training" (N8)."There may be a need for the licence to be renewed.... tests may be needed to allow nurses to renew their licence" (P2). "Periodic prescribing licences may need renewing …. Training must also be conducted through seminars and training courses ... Or they may need to take a test instead" (M3).*

Appendix Q Continued

Research questions	Themes	Sub-themes	Participants quotations
What potential changes are required to introduce the NP role in Saudi primary healthcare centres from the perspective of the macro-level (policymakers), meso-level (nursing supervisors and managers), and micro-level (nurses)?	**Primary healthcare centre readiness** This theme describes primary healthcare centres' readiness to implement nurse prescribing role. These are related to changing the PHC **infrastructure**, supporting the nurse prescribing role and ensuring safe prescribing practice.	**Sub-theme 1** **Changing PHC infrastructure**	*"Nurses should have additional prescribing authority as clinics are currently run by nurses without prescribing authority, and I do not perceive any significant change" (NS2). "The structure of clinics will not have to change significantly, because the nurse is responsible for three-quarters of the patients' trips to healthcare centres" (P4). "I am leading my clinic and so if I have prescribing authority and prescribe for the same patients then there is no need to have another clinic" (N5)."The patient's pathway could be modified since the current pathway includes access to the doctor for medication prescriptions. If the right to prescribe medications has been given to the nurses, the patient's pathway will be shorter. Nurses should complete the necessary documentation and write. So, the pathway will be shortened" (P4)."Have a clear organisational structure, I mean a clear patient pathway, as patients have no need to see a doctor" (N10). "Patients currently need access to a doctor …. If nurses prescribe, they do not need to access a doctor …. Patients' pathways inside PHC need to be changed as they may stop at a nursing clinic" (NS3).*
		Sub-theme 2 **Supporting the nurse prescribing role**	*"As long as the administrators of healthcare centres recognise that the role is valuable for service, for example, nurses who can prescribe medications can serve the healthcare centres by reducing the workload pressures on doctors and reducing patient waiting times … We [administrative teams] need to support the nurse to be a prescriber" (M5)."From my personal point of view, I feel that administrators will be happy and supportive, because it will reduce the pressure on the centre …. As a nurse prescriber, I can prescribe on behalf of a doctor for patients" (N7)."This is completely dependent on the circumstances in which the centre finds itself …. If there is a lack of doctors, for example, the nurse can take the doctor's place, then administrators may support the role" (P5). "Ongoing support from doctors is necessary … If I speak to the doctor, he will provide me with the knowledge I need …. I mean I may share the difficulties I face managing certain cases …. He may provide feedback about my prescribing practice … I will surely benefit from his experience and knowledge" (N 6)."Continuous support from doctors is needed not only at the beginning…. knowledge sharing among them can be arranged through regular meetings, this would greatly improve prescribing practice in general" (NS 1)."Doctors may provide support regularly when there is need …. They share their knowledge with nurses in prescribing and provide them with the information we need by regulating meetings to allow nurses to share their challenges and discuss how they can overcome them in their future prescribing …. Such support influences nurse competency positively" (P 1).*
		Sub-theme 3 **Ensuring safe prescribing practice**	*"They [nurses] should prescribe within their scope of practice. I mean, if they are responsible for patients with diabetes, they should not prescribe for patients who are not in their areas of competence, and in this way, we manage the risk of mis-prescribing medication" (NS2). "They [nurses] must only prescribe within their defined scope of prescribing. For example, nurses in the centre who are responsible for vaccinations cannot prescribe medications for chronic illnesses …. We can reduce the risk of medication errors" (M1)."I won't be a general nurse prescriber. For example, I work with pregnant women today and prescribe, and next month I could be working with chronic disease patients and prescribing for them. I don't think it's safe for them [nurses], and so I must only prescribe in my limited area" (N8). "Nurses must stay up-to-date using training courses, and must regularly up update their knowledge and skills related to the areas they prescribe in …. continuous professional development would help them to adhere to safe prescribing practice" (N 2)."*

Appendix R: Research integrity training

Research and Innovation Services

This is to certify that

Khloud Albariq

has successfully completed

Research Integrity Training (Student)

on

10th April 2022

Appendix S: Good clinical practice course certification

NIDA Clinical Trials Network

Certificate of Completion

is hereby granted to

Khloud Albariq

to certify your completion of the six-hour required course on:

GOOD CLINICAL PRACTICE

MODULE:	STATUS:
Introduction	N/A
Institutional Review Boards	Passed
Informed Consent	Passed
Confidentiality & Privacy	Passed
Participant Safety & Adverse Events	Passed
Quality Assurance	Passed
The Research Protocol	Passed
Documentation & Record-Keeping	Passed
Research Misconduct	Passed
Roles & Responsibilities	Passed
Recruitment & Retention	Passed
Investigational New Drugs	Passed

Course Completion Date: 14 June 2022

CTN Expiration Date: 14 June 2025

Eve Jelstrom

Eve Jelstrom, Principal Investigator
NDAT CTN Clinical Coordinating Center

Good Clinical Practice, Version 5, effective 03-Mar-2017

This training has been funded in whole or in part with Federal funds from the National Institute on Drug Abuse, National Institutes of Health, Department of Health and Human Services, under Contract No. HHSN27201201000024C.

Appendix T: Data storage information in Arabic

الاستعداد لامتداد دور التمريض ليشمل وصف الأدوية في مراكز الرعاية الصحية الأولية في المملكة العربية السعودية

مقدمة:

- شكرا لموافقتك على المشاركة. علماً أنه سيتم تسجيل هذه المقابلة صوتياً فقط، وستستمر ما بين ٣٠ إلى ٦٠ دقيقة. كما أود التنويه بأن مشاركتك تطوعية وأنه يمكنك إيقاف المقابلة في أي وقت.
- الغرض من دراستي هو استكشاف الاستعداد لامتداد دور التمريض ليشمل وصف الأدوية في مراكز الرعاية الصحية الأولية في المملكة العربية السعودية.
- ستركز المقابلة بشكل أساسي على معرفة رأيك حول تمكين التمريض من وصف الأدوية في مراكز الرعاية الصحية الأولية. كما أود أيضاً أن أستكشف رأيك حول العوامل التي قد تسهم أو تعيق تمكين تنفيذ دور واصف الأدوية لتمريض في المملكة العربية السعودية.
- أخيراً، أود مناقشة رأيك بشأن التغييرات اللازمة لتنفيذ دور واصف الأدوية لتمريض في المملكة العربية السعودية.
- من المهم أن تفهم أنني سأقوم فقط بتحليل البيانات التي تم جمعها من المشاركين أثناء هذه الدراسة؛ لذلك ستكون مساهمتي فقط بطرح الأسئلة. كما أود أن أذكر أنه لا توجد إجابات صحيحة أو خاطئة، لذلك كل ما تريد قوله يعدُّ بالغ الأهمية لبحثي. كما يمكنك عدم الإجابة عن أي سؤال إذا كنت ترغب في ذلك. يمكنك طلب أعادة سؤال خلال المقابلة في حال رغبت في ذلك.
- يمكنك سحب المعلومات المقدمة في المقابلة، من خلال الانسحاب أثناء المقابلة، أو سحب المعلومات التي تم تقديمها في المقابلة، ويكون ذلك متاحاً قبل تحليلها، أو تقديمها ضمن رسالة علمية.
- كما أود التنويه بأنه لن يتم الكشف عن هويتك. ويجب ألا تفصح عن أي معلومات قد تحدد هويتك أثناء التسجيل الصوتي، مثل اسمك الكامل أو عنوانك. سيتم كتابة محتوى التسجيلات الصوتية وإخفاء هويتك والاكتفاء بوضع رقم تعريفي فقط. كما أنه لن تظهر أي معلومات تحديد هويتك في أي تقرير أو منشور بحثي.
- سيتم تخزين التسجيل الصوتي بشكل آمن طوال مدة الدراسة فقط. وسيتم الاحتفاظ بمحتوى التسجيلات الصوتية (*anonymized transcript*)، ونموذج الموافقة بالمشاركة في المقابلة لمدة خمس سنوات. وسنقوم بإتلاف جميع السجلات بطريقة آمنة بمجرد انتهاء فترة الاحتفاظ. سيتم الاحتفاظ ببيانات التواصل (الاسم وتفاصيل الاتصال) بشكل آمن لمدة تقل عن عام واحد، من أجل مشاركة نص المقابلة، نتائج التحليلات الأولية، أو نتائج النهائية لدراسة إذا كنت ترغب في ذلك.
- كما أود أن أوكد أنه تمت موافقتك على المشاركة وذلك من خلال التوقيع على نموذج الموافقة بالمشاركة في المقابلة مسبقاً.
- هل أنت موافق/ة على أجراء المقابلة؟
  - هل لديك أي أسئلة قبل أن نبدأ؟

معلومات عامة.

- كم عمرك؟
- ما جنسيتك؟
- ما مستواك التعليمي؟
- ما تخصصك؟
- ما مسماك الوظيفي؟
- ما منصبك الإداري؟
- كم عدد سنوات الخبرة لديك في تطوير السياسات؟