



A cross-sectoral perinatal assessment and support intervention from the perspective of parents living with psychosocial vulnerabilities: A qualitative realist evaluation

Louise Lund Holm Thomsen^{a,*}, Marianne Stistrup Frederiksen^{a,c},
Clara Graugaard Andersen^a, Rhiannon Evans^b, Charlotte Overgaard^a

^a Department of Public Health, Unit of Health Promotion, University of Southern Denmark, Degnevej 14, DK-6705, Denmark

^b DECIPHER, Cardiff University, Maindy Road, Cardiff, Wales, CF24 4HQ, United Kingdom

^c Center for General Practice, Aalborg University (CAM AAU), 249 Selma Lagerlöfs Vej, DK-9260, Denmark

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ABSTRACT

Expectant parents experiencing psychosocial vulnerability face significant risk of adverse perinatal outcomes, including higher susceptibility to mental health challenges, preterm birth, and intrauterine growth restriction. These vulnerabilities necessitate differentiated and tailored perinatal care services. This study explored how, for whom, and under what circumstances a cross-sectoral psycho-social vulnerability assessment and support intervention in the North Denmark Region worked to improve coping abilities and parenting skills among expectant and new parents in vulnerable positions. Guided by a realist evaluation framework, we conducted 25 interviews with parents. They included 10 dyadic interviews with mothers and fathers and 15 individual interviews with mothers. We tested and refined key assumptions about mechanisms and contextual factors influencing intervention outcomes. Compassion, acceptance, and emphasis on both parental resources and vulnerabilities were central mechanisms fostering engagement in supportive dialogues about parenting and support needs. Critical contextual factors included sufficient interaction time, professionals' experience and confidence, and integrated collaborative practices among relevant services to create effective and timely safety nets for parents. The findings underscore the importance of relational continuity and trust in facilitating positive outcomes. The study shows that the intervention holds significant potential to achieve its goals when it successfully engages parents in supportive dialogues about their vulnerabilities and transition into parenthood. It further offers actionable insights into how cross-sectoral interventions can address the complex needs of vulnerable parents and advance care to reduce adverse outcomes.

1. Introduction

Expectant parents living with psychosocial vulnerability require perinatal care services that are differentiated and tailored to accommodate their complex needs (D'haenens et al., 2020), due to significantly higher risks of perinatal and maternal mortality and morbidity (Jones et al., 2022; Posthumus et al., 2016). This includes higher susceptibility to perinatal mental health problems (De Graaf et al., 2013), pre-term birth (Knudsen et al., 2021), intrauterine growth restriction (Harron et al., 2021; Kramer, 2015) and a range of other adverse perinatal outcomes (Harron et al., 2021; Knudsen et al., 2021; Rosenwein

et al., 2020). Risk factors include young maternal age, lower socio-economic status, belonging to an ethnic minority group, residing in socio-economically deprived neighborhoods, having a history of mental health problems or neurodivergent development conditions, a lack of social support, domestic violence or abuse (Harron et al., 2021; Jones et al., 2022; Mackintosh et al., 2024; Sule et al., 2022). Experiences of loss and trauma further compound women's and infants' susceptibility to harm (Scheele et al., 2020; Schmied et al., 2020). While paternal perinatal vulnerability remains less well understood, a history of depression or anxiety increases the risk for paternal depression (Tambelli et al., 2019). Parental perinatal mental health problems,

* Corresponding author.

E-mail addresses: louiselundthomsen@health.sdu.dk (L.L.H. Thomsen), Marisfrederiksen@health.sdu.dk (M.S. Frederiksen), cgandersen@health.sdu.dk (C.G. Andersen), evansre8@cardiff.ac.uk (R. Evans), chovergaard@health.sdu.dk (C. Overgaard).

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whether maternal or paternal, have profound implications for both child and family health (Darwin et al., 2021).

Consequently, psychosocial vulnerability encompasses a broad spectrum of external risks and lived experiences (De Groot et al., 2019; Scheele et al., 2020). As argued by Spiers (2000), focusing on external risk factors which place individuals or groups at risk of health or social problems represents an etic approach to vulnerability (Spiers, 2000). Spiers proposes combining this with an emic approach, which emphasizes the individual's lived experiences and highlights the temporal and social context of vulnerability (Spiers, 2000). In line with the principles of trauma-informed care (Isobel, 2023), everybody may have traumatic experiences, which support the need for antenatal assessment of vulnerability which acknowledge the individual's own perspectives.

Guidelines emphasize early identification of antenatal vulnerability to enable timely referral to supportive services (NICE N. I. for H. and C. E., 2010; The Danish Ministry of Health, 2021; WHO, 2016). However, evidence on effective screening tools remains limited (Gram et al., 2024; Schmied et al., 2020), particularly regarding paternal vulnerability (Darwin et al., 2021), and research on supportive services for vulnerable expectant and new parents is scarce (Pierron et al., 2018). Available evidence suggests that early, targeted interventions involving interprofessional collaboration including informational, organisational and relational continuity of care (Reid et al., 2002; WHO, 2018) can improve birth outcomes, parental coping and skills, parent-child attachment, and child wellbeing (Frederiksen et al., 2023; Morrison et al., 2014; Pierron et al., 2018; The Danish Ministry of Health, 2021, p. 316; Turienzo et al., 2021).

Despite some evidence of positive effects, pregnant women often report negative experiences with supportive interventions, particularly risk assessments. Such experiences are frequently linked to healthcare professionals' attitudes, which are perceived as dismissive, judgmental, or disrespectful (Downe et al., 2009; Feijen-de Jong et al., 2022; Jakobsen & Overgaard, 2018; Megnin-Viggars et al., 2015; Origlia et al., 2017). Disengagement may also occur when women feel insecure, unclear about an intervention's purpose or data use, or no longer identify with past vulnerability factors (Frederiksen et al., 2021a; Johnsen et al., 2018). Given the limited evidence base, there is a clear need for acceptable and effective interventions that balance professional and lay perspectives (Klode et al., 2020; Spiers, 2000), move beyond risk-focused approaches and privileging of professional knowledge (King, 2018; Vlassak et al., 2022), and clearly theorize mechanisms and context.

We responded to this extant gap by evaluating a cross-sectoral intervention targeting expectant parents in the Northern region of Denmark. The present paper reports on the realist evaluation component of the larger study, which explored parents' perspectives of how the intervention works. (Andersen et al., 2023; Ellehave et al., 2023; Gram et al., 2023).

1.1. Intervention

In Denmark, maternity care services are publicly funded and accessed by >99% of all women. Pregnancy is registered with the general practitioner (GP), who provides three routine antenatal consultations and at least one postnatal consultation. Midwifery care is predominantly organized as standard (non-caseload) care, while caseload or team-based midwifery models are available in selected areas. Health visitors offer home visits during pregnancy and the early postnatal period. Referral to obstetric care occurs in the presence of complications. Routine antenatal care includes systematic assessment of health-, lifestyle-, and psychosocial risk factors, and maternal mental health is monitored during postnatal home visits (The Danish Ministry of Health, 2021, p. 316).

In 2017, a comprehensive cross-sectoral intervention was established in the North Denmark Region to ensure early identification and support for expectant parents in psychosocially vulnerable positions. The

intervention aimed to reduce perinatal health inequalities by fostering cross-sectoral collaboration that could effectively identify psychosocial risk factors at an earlier stage and offer timely relevant support. It also worked to tailor cross-sectoral services to improve parents' coping abilities and parenting skills.

The cross-sectoral intervention is implemented as a health care agreement between the region and municipalities. It was co-developed by clinicians from three regional maternity wards (including their antenatal clinics) and the health visiting services across the region's eleven municipalities. Parents were not engaged in the development process. The intervention is an extension of routine antenatal care and included the following components and processes:

1. Extension of the first midwife consultation by 20 min (from 40 to 60 min) to include a 30-min systematic, dialogue-based assessment of vulnerability factors among all expecting parents during the first antenatal midwifery consultation.
2. A 60-min team meeting introducing a health visitor to identify and plan for support. In some locations, the cross sectoral collaboration further includes a social worker or family therapist when deemed relevant.
3. Targeted supportive services and bridging to existing community-based services. Examples of this was up to three subsequent team meetings, targeted parenting café, needs based health visits or family therapeutic sessions, Targeted antenatal parenting courses organized jointly by specialized midwives and health visitors or NGOs. Availability varied across the region.

An open-ended interview guide with prompts for risk and protective factors was developed for the dialogue-based assessment. The midwives were introduced to the dialogue-based approach and the assessment interview guide, via a workshop, at the time of implementation.

All expectant parents receive an invite for their first midwife consultation with information about some of the topics raised during the assessment. Topics include the parents' upbringing and relationship with their own parents, their personal resources, the thoughts they have about becoming parents or having another child and the social and mental strains they have previously or currently experienced in their lives. The parents are also informed that the purpose of these topics is to decide which offers of support would best meet their needs. If deemed relevant at the end of the dialogue, the midwife informs the parents about the team meeting, its purpose and who will be present at the meeting. Participation is optional.

Upon implementation, the intervention objectives, inputs, components and intended outcomes were described in the written health care agreement but lacked a formal programme theory to articulate its underlying assumptions about mechanisms of change, and interactions with existing structures, resources, practices and other contextual factors. This study is part of an extensive qualitative realist evaluation (RE) designed to address this knowledge gap. We commenced with elicitation of the initial programme theory (Ellehave et al., 2023), and subsequent studies tested this focusing on midwives' relational competencies (Andersen et al., 2023) and on building a trusting parent-professional relationship in the context of interprofessional collaboration (Gram et al., 2023). Both studies show how organizational structures must be supportive to obtain the best conditions for enabling midwives' relational competencies and confidence with the dialogue-based assessment tool to develop a trusting connection with the parents in the short time given (Andersen et al., 2023) and to extend this trust while bridging to relevant health and social care professionals and services (Gram et al., 2023).

The present paper compliments these studies by presenting data exploring the perceived effects of the intervention on parental coping abilities and parenting skills, and the mechanisms and contexts contributing to these effects from the perspective of new parents who underwent the intervention. Specifically, it addresses the following

research question:

How and under what circumstances does the cross-sectoral intervention contribute to improved coping abilities and parenting skills among expectant and new parents in vulnerable positions?

2. Methods

2.1. Study design

The overarching study design is a realist evaluation (RE) (Pawson & Tilley, 1997) to uncover causal chains of Contexts, Mechanisms, and Outcome (CMO) configurations reflecting theoretical assumptions of how the intervention works. In the overall study of the intervention, we adhered to the four phases of the realist evaluation cycle; 1) formulation of initial hypothesis (initial programme theory development), 2) data collection, 3) data analysis 4) testing and refinement of the hypothesis (Pawson & Tilley, 1997). The present paper reports on the testing of initial hypothesis reported in Ellehave et al. (Ellehave et al., 2023) and further refined during-studies reported in Andersen et al. (Andersen et al., 2023) and Gram et al. (Gram et al., 2023) thus adhering to phases 2-4.

RE draws on scientific realism and critical realism viewing reality as mind-independent and stratified into the empirical, the actual and the real domains (Bhaskar, 2013) and seeking explanation of phenomenon by abductively generating hypothesis (Mukumbang et al., 2023). Thus, RE allows for evaluation of interventions by examining and explaining underlying social processes and contexts shaping implementation and outcomes, including intended and unintended consequences and their causes (Bonell et al., 2015; Pawson & Tilley, 1997).

2.1.1. Context-, mechanism, outcome configuration (CMOc)

RE emphasizes abductively theorizing the workings of an intervention by constructing middle range programme theories from CMO-configurations (hereafter CMOc), extrapolated from multiple data sources and sociological and psychological theories (Tilly, 2018; Shearn et al., 2017). These CMOc are considered credible and testable hypothesis (Mukumbang et al., 2023). To construct CMO-configurations the realist methodology depends on retrodution and abduction (Jagosh, 2020; Mukumbang et al., 2023). Generative mechanisms emerge from the real domain, by asking retroductively what it is about the intervention that matters (Jagosh, 2020). **Mechanisms** generated by the researcher are heuristics (Williams, M. 2018) capturing the relationship between resources of activities (Mres) provided by an intervention in a certain context, and the reasoning or response (Mreas) of the actors receiving these resources/activities, leading to specific outcomes (Pawson & Tilley, 1997). Mechanisms are the key to understanding how an intervention works composed of the two interlinked parts: resource and reasoning (Pawson & Tilley, 1997). Mechanisms are activated by contexts. **Context** refers to circumstances (individual, interpersonal, organizational) within which an intervention is implemented (Pawson & Tilley, 1997). The combination of contexts and mechanisms are responsible for **outcomes** whether observed or not.

2.1.2. Phase 1: initial programme theory development

Following the RE cycle (Pawson & Tilley, 1997), the first phase of the overall evaluation involved formulation of initial hypothesis (CMOc) through elicitation of an initial programme theory (Funnell & Rogers, 2011; Pawson & Tilley, 1997). The initial, comprehensive programme theory was informed by analysis of the written health care agreement and guidelines for practice and interviews with practitioners. Five emerging hypotheses were generated as to how the intervention was expected to work with regards to enhancing parents' coping abilities and parenting skills (see Table 1) (Ellehave et al., 2023). Potentially unintended harmful impacts and associated mechanisms were also theorised (Bonell et al., 2015, p. 3).

Table 1

Programme Theory. CMOc: C = context, M-res = mechanism resource, M-rea = mechanism reasoning, O = outcome (see methods for explanation). *Text in bold indicates refinement.

CMOc	Initial programme theory (IPT) – informed by document analysis, literature search and practitioner interviews (Ellehave et al., 2023)	Final revision interviews with parents*.
CMOc_1	If parents in psychosocially VP, some with previous negative experience of the social and health care systems (C) are met by a sensitive and acknowledging professional approach (M-res) Then they feel understood, safe, and valued (M-rea) and thus will be more inclined to engage in offers of support (O). HCPs possess appropriate relational competences and knowledge about vulnerability in pregnancy (C).	If parents in psychosocially VP (C) are to feel safe (M-rea) to engage in assessment and support (O) then compassionate communication involving acceptance and acknowledgment of their resources and a family centred approach (M-res) must be delivered by experienced and/or confident professionals with time for the dialogue (C).
CMOc_2	If parents in psychosocially VP (C) receive interprofessional support, based on well-functioning cross-sectoral collaboration (C) then more needs can be identified and met in a coordinated manner (M-res), leaving parents feeling safe between services (M-rea) and experiencing comprehensive, coherent support (O).	A: If the needs of parents in VP (C) are identified and followed by support in an integrated interprofessional team (C) securing shared understandings and managerial and informational continuity of care across antenatal, intrapartum and postnatal services (M-res) leaving parents less stressed, feeling safe and supported between services (M-rea + O). then support is more likely to be timely, targeted and coherent (O) Dark logic: When managerial continuity is lacking between antenatal, intrapartum and postpartum services (C) parents are left to self-manage the gap left by an informational discontinuity resulting from this (M-res) and the risk of stress, being unsupported and feeling stigmatized increases (M-rea + IO).
CMOc_3	If parents receive well timed and clear communication around the assessment and offers for support (C) they are involved and given a foundation for decision-making (M-res) and parents feel valued and experience being in control over their care pathway (M-rea). They are thus more inclined to engage in support (O).	Dark logic: When clear information about the nature of services is lacking (C) parents are not involved in decision-making (M-res) This fosters uncertainty/distrust, feeling of being labelled and disempowered (M-res) and the risk of stress in pregnancy increase and dissociation with support is likely (O) Dark logic: If decision-making is made in a mono-disciplinary context (C) the risk of informational discontinuity between services increases and thus also the risk of subordinate support (O) because the disciplinary perspective on needs narrows/ changes the space for action (M-res) resonating discontinuity between services and professionals and uncertainty in parents (M-rea)

(continued on next page)

Table 1 (continued)

CMOC	Initial programme theory (IPT) – informed by document analysis, literature search and practitioner interviews (Ellehave et al., 2023)	Final revision interviews with parents*.
CMOC_4a CMOC_4b	When the intervention provides support with relational continuity (c) then familiarity and predictability (M-res) is enabled which can resonate security and trust (M-rea) between parents and their caregiver or care giver team. This reduces stress and enables better targeted support (O). If Parents in psychosocially VP (C) experience relational continuity (C), then a trusting relationship with their caregiver team can develop (M-res) and they feel safer to reach out when in need (M-rea) and are more likely to engage in support to strengthen their coping ability and parenting skills (O)	CMOC_4: When the intervention provides support with relational continuity (c) then familiarity and predictability (M-res) is enabled which can resonate security and trust between parents and their caregiver or care giver team in and between services during one or more phases of the perinatal trajectory (M-rea). This supports parents' coping abilities and empowers parents to reach out for support when a need arises (O).
CmoC_5	Strengthened (sense of) coping abilities and parenting skills (O) is more likely to be achieved when early assessment and support is initiated (M-res) because expecting parents are most open to changes early in pregnancy (C).	Dark logic: When parents are left to reach out for support when needs arise (c) surplus is required and insecurity about ones needs (m-res) leaves parents to postpone or avoid reaching out (m-rea) whereby a potential harmful situation is exacerbated (O). parents in psychosocially VP who lack surplus to reach out for support (C). Must be offered early and continuous proactive assessment of psycho-social needs to strengthened coping abilities and parenting skills across all stages of the perinatal trajectory (O) because relevant support can be offered at the right time (M-res) resonating in parents the feelings of security and being supported (M-rea).

2.1.3. Phase 2: data collection: realist interviews

We conducted tests on the five initial CMOs that comprised the initial programme theory, by conducting interviews with parents who had been offered team meetings. We used purposeful sampling, considering the different settings in which the intervention was implemented, as well as paying attention to various vulnerability factors characterizing the target group. Most parents included in the study were disadvantaged by multiple psychosocial risk factors. These were a history of abortions, mental health issues, psychiatric conditions and co-occurrent divergent development conditions such as ADHD/ADD and Autism. Some parents had experienced adverse childhood events, including care failure, foster care, bullying, and parental divorce, which impacted their coping abilities as parents. Additionally, some parents had children in foster care, and others were identified as vulnerable due to the recent loss of a parent or sibling.

Parents were recruited across eight of the 11 municipalities in the region by engaging health visitors and midwives as gatekeepers and by visiting targeted parenting cafés. These are weekly community sessions for vulnerable new parents, led by health visitors and/or midwives, providing parenting support, introducing relevant topics and services, and opportunities to connect with local peer networks.

Health visitors informed parents who had participated in one or more team meetings about the study by phone or face-to-face during

home visits. With parental consent, contact details were passed on to the first author, who confirmed participation, and arranged and undertook all interviews. Parents could opt out if they had changed their mind. Recruitment also occurred at parenting cafés targeting parents in vulnerable positions, where oral and written information about the study was provided directly by LLHT. To accommodate parents with dyslexia, a video presentation was accessible via a QR code.

We conducted 25 realist interviews (Manzano, 2016), of these 10 dyadic interviews with both parents and 15 individual interviews with mothers. All fathers chose dyadic interviews with the mothers, reasoning that they had been through this together and would be able to support each other's memory of events during the interview. Parents were recruited 2–9 months postpartum to allow for both immediate and intermediate intervention outcomes to surface. Parents were only interviewed once. Participants were 11 primiparous mothers and 8 primiparous fathers, 14 multiparous mothers and two multiparous fathers. Participant ages ranged from 20 to 43 years. Two mothers were single parents.

Interviews worked to test and refine the CMOs through the functions of teacher-learner cycle and conceptual focusing (Manzano, 2016; Mukumbang et al., 2020) contributing to mutual understanding of central context-, mechanism- and outcome configurations (Pawson, 1996). The teacher-learner cycle involves presenting the initial programme theory to the interviewees and eliciting their responses based on their knowledge and experiences with the intervention, hereby adding to the refinement of the theory. While we applied the question style suggested by Manzano (2016) and Mukumbang et al. (2020) to instigate the teacher-learner cycle, interviews were planned with attention to ethical considerations (Dempsey et al., 2016). Thus, it was decided that program theories were examined implicitly during interviews to avoid distancing participants from their lived experiences. Interviews began with open, reflective questions about participants' first consultation with the midwife. Subsequent probing was guided by the interviewer's (LLHT) awareness of the program theories. Participants were informed in advance about potentially sensitive topics, could decline to answer any questions, and were asked for permission before sensitive topics were introduced. At debriefing, participants were invited to raise concerns and were encouraged to contact LLHT or their health visitor if issues arose following the interview.

2.1.4. Phase 3 and 4: data analysis and programme theory refinement

Interviews were audio-recorded, transcribed verbatim and imported to Nvivo14 (Release 14.23.2) for coding. Data analysis was inspired by Gilmore et al.'s (2019) memo technique and Jackson and Kolla's (2012) linked coding technique. A code for each initial CMOc was developed and a linked memo was attached.

Large interview excerpts were initially coded to five individual CMOc parent codes. Next step consisted of coding the large excerpts using the linked coding technique (Jackson & Kolla, 2012) with attention to eliciting strings or dyads of CMOc and granulating mechanism into mechanism resource (m-res) and mechanism reasoning (m-rea). This allowed for revisions that were coded as child codes and new configurations (additional parent codes). Any insights this coding added to confirm, refine, or falsify initial CMOc's was recorded in the linked memo of each parent code to strengthen transparency and rigor in the analysis (Gilmore et al., 2019). The construction of refined CMOc's was critically discussed by members of the research team.

2.2. Ethics

According to the Danish Act on Research Ethics Review of Health Research Projects, only studies involving liveborn humans or biological material can be submitted for approval by the National Committee on Health Research Ethics. Stand-alone qualitative studies rely solely on written informed consent and are therefore not eligible for submission (National Committee on Health Research Ethics [NCHRE], 2018).

All interviewees were informed about the study verbally and by written material. Written informed consent was obtained from all participants, who were assured of their right to withdraw from the study at any time without explanation (Radley-Gardner et al., 2016).

The study complied with the General Data Protection Regulations of the European Parliament and the Council of The European Union (European Parliament & Council of the European Parliament and of the Council, 2016; Radley-Gardner et al., 2016), and The Helsinki Declaration (World Medical Association Declaration of Helsinki, 2013) and its principles for conducting research involving human subjects.

3. Findings

The findings are structured around the five revised CMOCs, explaining how the cross-sectoral intervention brings about change related to increased sense of parenting skills and coping abilities. Four of the five CMOCs include a focus on mechanistic pathways to unintended and harmful outcomes, that emerged from the data.

3.1. CMOC_1: A compassionate approach

A central mechanism in approaching parents is compassion. When parents encountered compassionate professionals, who acknowledged both their vulnerabilities and resources, they felt safe engaging in dialogue about their challenges and were motivated to accept support. When they felt acknowledged and not judged, they were more likely to let their guards down in the interaction with midwives and health visitors, as one mother explains:

"It has actually given me an incredible sense of security (...) because I've always been afraid that the municipality would judge me because I'm a foster child, but also because I have mental challenges, and they would see it as something negative, and therefore they would remove [child] (...) but there hasn't been anything. And that's probably why I felt like accepting that extra support (...)" (Par. 6)

Overall, acceptance, no judgement, openness, and a focus on strengths alongside vulnerability stood out as vital in forming a compassionate approach. This made parents with prior negative experiences of systemic judgement feel valued and capable, fostering trust in both the professional and their own resources:

"(...) if there's generally such openness as I've experienced, where there's no judgment (...) then I also think that more people would be honest about what they're struggling with". (Par. 8).

Compassion and a focus on the positive experiences of their pregnancy and parenthood thus contributed to parents feeling safe, acknowledged, and listened to. These feelings were essential for parents to reach out and accept support.

There were some limited contextual factors, including when attempts of dialogue failed and parents felt judged by the professional because of their past experiences:

"I am myself a dandelion child [prosper despite adverse care giving context] (...) Then the professionals began to emphasize: 'Well, where you come from, that's almost what you become' (...). They would have liked to initiate something due to my childhood. But now, I'm almost 40 years old, and I think: 'My childhood, maybe it has already been processed some time ago'" (Par. 5).

This dialogue signifies a failing in non-judgement which is central to a compassionate approach and trauma-informed care. Another significant factor was professionals' confidence and expertise. Encountering an experienced midwife contributed to feelings of safety. Newly trained midwives could also foster similar feelings when they conducted the assessment and delivered care with confidence and compassion:

"It's just different when you're sitting with someone who knows something about it" (Par. 1).

Time was another important contextual factor. When professionals had sufficient time for dialogue, it made parents feel safe and valued:

"Our midwife took plenty of time for [the assessment], and we felt heard and acknowledged for who we are and what our concerns were (...) Our midwife was very warm-hearted, and from the moment we entered the consultation, we felt very welcome. At the same time, we didn't feel pressured to accept the offer" (Par. 4).

Conversely, time delays or hurried encounters disrupted the safe space of midwifery consultations, limiting what parents felt able to discuss. One mother discussed holding back because of her awareness of the lack of time:

"I always feel that midwife consultations have been rushed (...) Once we were inside, we had a really good midwife (...) I can figure out that when she's 20 minutes late for our conversation, there are others waiting on the other end. So many times, I didn't feel there was time to think (...) It was more like, 'Well, now we better get going, because there are others waiting too'" (Par. 13).

These findings confirm and refine the initial CMOC_1. The way professionals approached parents is central for them to feel safe to engage with the intervention. The data added details on what a sensitive and acknowledging approach (IPT-CMOC_1) involves. Parents consistently emphasize the importance of compassionate professionals, who acknowledge their vulnerabilities while also focusing on their resources and abilities. Additionally, sufficient time, experience with vulnerability, and confidence in delivering care were consistently acknowledged by parents as essential contextual factors for such approach to unfold.

3.2. CMOC_2: managerial and informational continuity

Data showed that continuity between services and thus shared understandings of needs is a key mechanism in benefitting from the assessment and support provided in the intervention. All parents experienced some level of collaboration, coordination or information transfer between midwives and health visitors. When introduction to their health visitor during pregnancy was coupled with interprofessional support (two key elements of the intervention), this was perceived as beneficial. This context of integration between services facilitated a shared understanding of parents' vulnerability and needs for support between care providers, which contributed to feelings of safety:

"That the health visitor has been involved, so she heard everything we discussed with the midwife. It makes the transition a bit smoother (...) so you don't have to explain your story a thousand times. That she knows us, who we were, gave me a sense of security" (Par.22).

However, not all parents experienced a consistent, high level of integrated cross sectoral collaboration during the intervention. Collaboration between midwives and health visitors was often limited to the antenatal period, and midwives were often not part of the tailored postpartum supportive services as intended in the health agreement. Some parents experienced care gaps between labour ward, hospital postpartum ward and municipality postpartum services. As a result of this context, continuity of care and thus shared understandings of the needs for care throughout the perinatal period was rarely achieved, neither on an informational, or managerial level:

"During the team meeting, we talked a lot about the upcoming birth. They delved much deeper into how to make it better for you (...) When I was about to give birth, I had to explain things myself. Sometimes, I think it happens quickly. They have their own tasks to attend to and keep an eye on" (Par. 3).

When the interprofessional team failed to ensure that care plans and important information were shared and acted on, the meaningfulness of team meetings diminished. In such contexts of discontinuity, parents were left to navigate services themselves.

Women with multiple vulnerabilities or who received specialized services such as psychiatric counselling, were particularly impacted when the intervention did not meet the intended goal of collaborative and coherent care. Lack of informational continuity was another concern for multiparous parents when they were allocated different health visitors for their children.

In hospital settings, some parents experienced discontinuity (context) as a disappearance of that key mechanism of compassionate, accepting, and family-centred approach they had received from their known professionals during pregnancy. In the following, a mother recounts a difficult care experience:

"[Giving birth] was awful (...) Five different midwives, most of whom were kind (...) except for the second-to-last one. She was simply dreadful (...) sitting at a computer, more focused on it than on me (...) And then she wanted to examine me (...) There was no asking or anything; she just started doing it" (Par. 23).

Thus, the context of discontinuity provides the mechanism resource of uncompassionate care delivered by the midwife which triggered a response of feeling unsupported in this mother. The context of discontinuity is also related to general practitioners. Parents expressed that greater involvement of their general practitioner in the intervention could have supported care coherence, earlier identification of care need and timelier referral to relevant services:

"I think that the period from giving birth to the 8-week checkup feels quite long. Not so much in terms of physical aspects, but rather the psychological ones. In that regard, I think doctors could - During the five-week examination (...) if you've had the same doctor for a long time, then they might be able to see beyond the facades you often put up when feeling vulnerable" (Par. 18b).

These findings confirmed but refine the initial CMOC 2 with details of requirements for the integration of interprofessional collaboration for parents to benefit from it. When integration of managerial and informational continuity in the care across pregnancy, birth and the postpartum period, parents experienced care as timely, targeted, and coherent, which reduced stress and made them feel safe and supported to cope with pregnancy, birth and parenthood. Conversely, the risk of stress was increased when continuity failed, and parents felt unsupported and disengaged with services due to lack of care coordination and collaboration between services.

3.3. CMOC 3: decision-making

All parents had been informed in writing about the dialogue-based psychosocial assessment that would take place during their first midwife consultation. Many, but not all, felt that the midwife allowed them the choice of engaging in this dialogue and offers of support. In this context, parents felt that sharing their challenges during the assessment were voluntary as this dad reflects:

"I think it's good that they get close. They are sharing a part of our lives where we might be more vulnerable than usual. So, it's good that they delve into the details. Of course, there are some questions where you think, 'Ahhh, maybe that's a bit too intrusive!' I had the feeling that you could say that to her (...) And you don't feel like it's being forced upon you either" (Par. 18b).

Some parents were not sure whether taking part in team meetings (a key element of the cross-sectional intervention) was voluntary, and worried about the potential consequences of not accepting participation:

"I was told that (...) we were supposed to have those team meetings because I was young, and also because of my partner's upbringing (...) I don't know if there was an option to say no (...) but if I did say no, I think they would have been more attentive to 'why did they decline?' (...) No, I actually didn't know, is it voluntary?" (Par. 2).

Engagement of parents in shared decision-making was not identified as a consistent mechanism resource of the intervention. A prominent context was health professionals' lack of knowledge about the availability of services. Feeling left out on decisions prompted the mechanism reasoning of uncertainty, distrust, and frustration, which for some parents lead to increased stress during pregnancy:

Mum: "[The health visitor] (...) had contacted a place where [dad] could talk to a psychologist (...), a place where you didn't need a notification to go. But then (...) she felt that the offer for [dad] wasn't sufficient. So, she made a notification because she found the situation so concerning (...) and she thought you should go to the family services because they believed they had an offer that [dad] could benefit from."

I: What did you think about it?

Dad: Well, it was fine because I wanted to improve and address things proactively. What bothers me is that I found out they didn't know exactly what kind of offer it was. It's like, 'Now we're sending you there.'

I: Has it had any consequences for you afterwards, the notification of family services?

Mum: It has weighed on me a lot. I felt like I was being scrutinized because I wasn't good enough. That's the primary feeling.

Dad: The absurd thing is that the reason they did it was because they were worried that [mum] might break down. And by doing it this way ...

Mum: I was on the verge of breaking down. Because it was more than we needed (Par 12a + b).

Overall, shared decision-making was often compromised in contexts where parents were not sufficiently informed and lacked clarity about the purpose of supportive services offered:

"I had absolutely no idea about that until we joined that [ordinary] maternity group, and (...) me and [other mum] (...) thought it was a bit strange that the others hadn't been offered [parents' Café]. Because we all have the same health visitor (...) So we asked about [parents' Café], why some people are offered it. Then [the health visitor] said it's because some had greater needs than others. And I thought, 'Oh, that's why!' (...) I've realized I'm in a special group, I've thought, 'Ohhh yes. That's why there are so many of them [with vulnerabilities]'" (Par. 14).

While decisions on care plans and support were intended to be made collaboratively between parents and the different providers involved in their care via team meetings, this did not always take place. Some parents experienced different – and at times contradictory – decisions made by individual professionals without involving the parents or other professionals, creating uncertainty about whose advice to follow:

"I am a foster child (...) and I've had some challenges, and I've been through psychiatry (...) and I talked to the midwife about it (...) so they actually scheduled a team meeting, but then the health visitor wrote to me that she wanted to meet me first (...). So she came to my home (...) and she said that based on our conversation, she would actually cancel this team meeting because she felt I didn't need it (...) I received what they call a crisis offer, where I got extra health visitor support if needed" (Par 6).

Findings confirm the initial CMOC 3 emphasizing the importance of clear communication about the intervention allowing for engagement of parents in decision making regarding their vulnerability and needs for support. Our findings show that when professionals fail to clearly communicate the nature or purpose of the support offered – or the voluntary nature of the intervention – this creates a context where

parents are not engaged on an informed basis, resulting in insecurity about why and how to engage. Additionally, when interdisciplinary collaboration is compromised, it creates a context triggering uncertainty and disrupts continuity of care.

3.4. CMOc_4: familiarity and trust

Relational continuity, established through early introduction to a permanent health visitor during pregnancy fostered familiarity and trusting parent-professional relationships supportive of parents' sense of safety and preparedness. This was a crucial mechanism leading to better coping abilities during pregnancy and postpartum. When parents had continuous contact and developed a trusting relationship with a permanent professional, they felt understood their vulnerabilities and potential reactions, they felt supported and better equipped to manage challenges during the perinatal period. This sense of continuity allowed parents to perceive their known professionals as a reliable safety net, fostering trust and enabling them to reach out for support when needed:

"The reason why [intervention] made me feel safer was that I knew that there were professionals who knew about the problem, who would catch me if it was going down" (Par 4).

This mechanism was particularly beneficial for parents with a known diagnosis or earlier experiences with loss of pregnancy, factors that could trigger a postpartum reaction, infant bonding difficulties and/or depression. Parents highlighted how early support coupled with relational continuity helped them address emotional challenges and avoid negative consequences:

"One had somewhat mentally said goodbye to the biological child. So (...) it's a bit challenging to fully feel excited (...). I've been in a long-lasting, depressive, anxiety-filled state, where things just kept getting worse over time. But it was eased through [team meetings] conversations. Medication wasn't necessary." (Par. 1).

The establishment of trusting parent-professional relationships in early pregnancy via permanent professionals and hence relational continuity additionally facilitated a nuanced understanding of the family's needs enabled tailoring support that was both relevant and effective:

"With the health visitor, I have said this and that to her, asked her 'why?', 'I might be a bit stupid' I said. 'Well, nothing sounds stupid or anything' [said Health visitor] and she said: 'ask if there's anything, or, say if there's something you think isn't quite right'. So, we did that, and we've really had a good cooperation on things. (...) She was really supportive and was there a lot even though she was busy. She was there." (Par.23).

Our findings confirm CMOc_4a and 4b. When the intervention is delivered by permanent professionals and thus fosters a context of relational continuity, then the mechanism of familiarity and trust enables a feeling of safety in the parents; there is someone to catch them, and support can be tailored. Our findings revise this CMOc by adding empowerment of parents to reach out for help as a response to the resource of familiarity and trust. A disabling context for these mechanisms is a breach of trust or breach of continuity due to change in work organization.

3.5. CMOc_5: continuous assessment

While relational continuity was generally established through the introduction of the families' permanent health visitor, post-partum support did not always meet the needs of the family. Questionnaire based screening for postpartum depression is routinely undertaken by health visitors two months after birth, but parents living with vulnerabilities who experienced a post-partum reaction highlighted the need for earlier attention to this. Some reported a shift in the health visitors focus from parental wellbeing to infant wellbeing and physical growth, leaving them feel inadequately supported:

"During pregnancy, they really focused on this, a little nervousness after childbirth, and how it would go, and how I would react. When [baby] arrived, it's like something has closed off (...). In a time when you don't have much surplus to begin with, you must reach out yourself (...), perhaps if they could (...) take a little more time to inquire about the parents" (Par. 24)

Parents expressed that proactive and continuous assessment of their needs throughout the perinatal period was crucial for timely support. Despite relational continuity, some felt overwhelmed by having to manage reaching out for support, as illustrated:

"Everything escalates in the end, where I feel really, really bad, and we've had a tough time at home (...) I'm just told to call if there's anything, but I don't (...) it was also something about specific times when I should call, and I couldn't quite handle it—I don't want to burden [Health Visitor] if it isn't really urgent. So therefore, I didn't do it" (Par. 13).

The findings confirm and extend CMOc 5 by underscoring the dual importance of relational continuity and timely, proactive support. Relational continuity is essential for building trust, parents' capacity to reach out and adequate tailoring of support; hence for parents to benefit from the intervention. However, refinements of the CMOc highlight the need for professionals to adopt a proactive and individualized approach. Parents receiving support in the intervention often did not have the capacity to reach out or self-navigate care, especially first-time parents felt uncertain about whether their concerns would warrant professional attention. The findings show that addressing parents' needs at the right time, ensuring they feel supported without having to shoulder the burden of initiating contact during an already vulnerable period, is vital for their outcomes of the intervention.

4. Discussion

This study tested and refined the programme theory for the cross sectoral intervention targeting new and expectant parents in vulnerable positions. Understanding how the intervention can bring about outcomes is crucial given the paucity of effective interventions in this area and that it is already in routine practice. The findings provide nuanced insights into the mechanisms that enable or hinder intervention outcomes, grounded in specific contexts.

Our findings confirm that a professional approach throughout the intervention should involve sensitivity and acknowledgment. We refined this by adding *compassion*, involving acceptance, no judgment, openness, and emphasis on parents' resources and positive pregnancy experiences, contributing to a safe space for parents. This aligns with attributes of compassionate midwifery (Ménage et al., 2017) as well as key components of supportive care practices as illustrated by Frederiksen et al. (Frederiksen et al., 2021b). A compassionate approach by anyone in the care team helped parents feel safe to discuss vulnerabilities and accept support. Conversely, feeling judged based on past vulnerabilities discouraged engagement. Similarly, Mule et al. (2022) identified lack of trust and feeling estranged from their midwife as key reasons for women not to disclose vulnerabilities or accept support (Mule et al., 2022). Our findings resonate with other studies highlighting that a warm and empathetic professional approach is essential for women to engage in perinatal psychosocial assessment and establish early, supportive relationships (Frederiksen et al., 2021b; Rollans et al., 2013).

Additionally, sufficient *time* for interaction and *professional experience and/or confidence* emerged as key contexts for fostering a compassionate, family centred approach supportive of coping abilities and parenting skills. These contexts allowed parents to take the needed time to share concerns and feel supported, as they perceived professionals as both understanding and equipped to address their needs for support. This resonates with a related sub-study in the overall realist evaluation including midwives' perspectives, where we also found that experience,

interest, time, caseload, flexibility and professional autonomy were enabling contexts for midwives to conduct a confident, sensitive and thorough assessment (Andersen et al., 2023). Andersen et al. study revealed the challenge and strategies for creating a connection with the parents supportive of engaging them in sensitive topics during short time of the first antenatal consultation to avoid stalling this and consequently the team meeting and delivery of support (Andersen et al., 2023). One strategy was commencing the consultation with other routine questions and checking on the baby. Flexibility and professional autonomy to organize their own workload supported midwives in trying make rapport with the parents (Andersen et al., 2023). Mule et al. similarly reported that rushed assessments and use of closed ended questions discouraged disclosure of mental health concerns (Mule et al., 2022).

A related mechanism identified in this study was the importance of involving parents in decision-making. When parents felt excluded from decisions or perceived these as based on expert appraisal without acknowledgment of their own perspective or resources, they felt watched and reluctant to engage with supportive interventions thus inhibiting opportunities for improved coping abilities and parenting skills. Rollans et al. (2013) reported that lack of preparation for discussing sensitive topics like domestic violence during psychosocial assessment could lead to feelings of intrusiveness and being judged (Rollans et al., 2013). Lack of involvement in decision-making and inadequate information was also a recurrent theme in a meta-synthesis of parents' experiences with perinatal mental health care, significantly affecting access to support (Megnin-Viggars et al., 2015). Parents often felt treated as labels rather than individuals, lacking choice and compassionate care (Megnin-Viggars et al., 2015). Ebert et al. (2014) found that socially disadvantaged women adhered to midwives' care because they perceived midwives as knowing better (Ebert et al., 2014). The relationship between power and care in decision-making is recurrent in studies of maternity care for vulnerable groups, confirmed in our study. Rayment-Jones et al. (2019) emphasized how marginalized women faced disadvantages due to language barriers and unfamiliarity with the system, while others experienced paternalistic care and biases based on race, class, ability, age, and other factors (Rayment-Jones et al., 2019). Using a standardized approach to identify vulnerabilities may help reduce variations in perceived risks and minimize professional bias (Vlassak et al., 2022). However, flexible organization of workload, training, and experience are essential to support vulnerable expectant parents effectively (Andersen et al., 2023; Vlassak et al., 2022).

Trauma-informed care recognizes that many individuals have lived experiences of trauma (Hillard, 2022), which may be re-activated in perinatal care through, for example, asymmetrical power relations, loss of control, or intimate physical examinations (Isobel, 2023). As our findings indicate, parents' sense of safety depended on professionals adopting sensitive and compassionate approaches, facilitating participation in decision-making, and allowing sufficient time during consultations. These elements align with core principles of trauma-informed care, including safety, transparency, and choice, such as informed consent, individualized care, and shared decision-making (Sperlich et al., 2017). Integrating trauma-informed principles into antenatal screening and referral processes may therefore help reduce the risk of re-traumatization in maternity care services.

Creating coherent care pathways requires both professional-, informational-, and managerial continuity, and is vital not least for expectant or new parents in vulnerable positions (Frederiksen et al., 2023). Collaboration in this intervention, however, seemed multi-disciplinary rather than integrated and health professionals' knowledge about appropriate local services varied across the region, ultimately affecting support offers and the transitions to services. In a Danish context, antenatal care is provided by the women's general practitioner, a midwife, and a health visitor (The Danish Ministry of Health, 2021, p. 316). The general practitioner is, however, not part of the formal health agreement encompassing the cross-sectoral intervention, a lack that

leads to fragmentation of antenatal and post-partum care across the region as well as nationally (Brygger Venø et al., 2022). This resonates the findings internationally of the need for greater involvement of general practitioners in local integrated perinatal mental health services (Noonan et al., 2018). Discontinuity between services, such as gaps in communication between providers, sometimes causes contradictory decisions and overruling decisions made by different professionals. For instance, parents experienced the transition from hospital services postpartum to home as a phase where health visitors' focus shifted from their wellbeing to the infant's physical growth, relegating parents to a secondary role. Frederiksen et al. (2023) found that relational continuity can contribute to parents feeling safe to reach out for support as well as contribute to health professionals being able to identify changes in mood, behaviour and mental health, even before the parents recognize it themselves. However, this study adds is that even though relational continuity is in place, parents in crisis or with deteriorating mental wellbeing can still find it challenging to reach out for support. Furthermore, even though the health visitor knows the family, they did not always realize negative developments timely (CMO_5). This calls for an increased attention towards taking a proactive approach to ensure that parents receive support instead of relying on parents reaching out when they experience challenges. Harrison et al. (2011) showed the positive impact of repeated assessments during pregnancy, highlighting that adapting care to continuous psychosocial assessment enhances perinatal outcomes (Harrison et al., 2011).

Overall, our findings support the notion that relational continuity plays a key role in building trust and encouraging engagement with supportive services to allow parents the opportunity of improved coping abilities and parenting skills. As outlined in our initial programme theory (Ellehave et al., 2023), relational continuity was assumed to be key in building trusting parent-professional relationships, supporting the intended intervention outcomes. Although not fully theorized initially, our findings, along with those of Frederiksen et al. (2021b, 2023) and Fernandez Turienzo et al. (2021), suggest that relational continuity is essential for trust and service engagement. However, trust may fail to develop if the professional approach is not sensitive or aligned with parents' needs (Frederiksen et al., 2021b; Gram et al., 2023; Rayment-Jones et al., 2019). CMOc_3 illustrates that overruling shared decision-making can lead to breaches in trust and unmet needs for support.

Our findings show that the intervention holds significant potential for improving the coping abilities and parenting skills of parents in vulnerable positions. However, several challenges were identified due to the nature and quality of the cross-sectoral collaboration, highlighting the potential for further development. Adopting a Realist Evaluation methodology has proved vital for these insights to surface.

4.1. Implications for policy and practice

Guidelines for maternity care in Denmark recommend early assessment and tailored cross-sectoral support for parents with complex vulnerabilities (The Danish Ministry of Health, 2021, p. 316). However, studies of Danish health agreements highlight challenges in stakeholder involvement and standardizing collaboration across regions with differing resources (Rudkjøbing et al., 2014).

Improving support for parents in vulnerable situations requires stronger inter- and intra-organizational collaboration involving all relevant services, not only midwives and health visitors. Greater consistency across the care pathway could be achieved through standardized collaborative practices and training that establishes core competencies in collaboration (D'Amour et al., 2008), compassion, and needs-based care.

The study has already informed several initiatives. Follow-up workshops with midwives and health visitors have strengthened existing partnerships and promoted broader cross-sectoral collaboration. In addition, the research team initiated and leads **Building Lives and**

Opportunities by Minding Parents (BLOOM), which aims to develop a national program for identifying resources, risks, support needs, and referral pathways during pregnancy and the postnatal period. The project brings together health and social sector stakeholders from three regions, national maternity care stakeholders, and parent representatives.

4.2. Strength and limitations

There are several strengths to this study. It presents a rigorous application of realist evaluation principles, enabling an in-depth exploration of the mechanisms driving both intended and unintended outcomes of the intervention. Realist interviews encouraged reflection beyond mere accounts of experiences, sustaining our theoretical awareness (Mukumbang et al., 2020) and enhancing explanation-building from the data collection phase. By employing retrodution and abduction, we uncovered deep explanations for how, for whom, and under what circumstances the intervention worked. We balanced implicit and explicit theory testing to allow participants to tell their story in their own way (Manzano, 2016). The study is also strengthened by the geographically and demographically diverse sample, which included both mothers and fathers with a wide range of vulnerabilities across eight municipalities. All fathers participated in a dyad interview together with their partner. Interviewing couples together have both strengths and limitations (Bjørnholt & Farstad, 2014; Mellor et al., 2013). One partner may speak more during the interview with the consequence that the other partner's voice left out (Zarhin, 2018). In this study, fathers generally spoke less during interviews, and therefore there might be potential in exploring in further detail how fathers and partners engaged with the intervention.

Some limitations should be considered when interpreting the findings of the study. Parents from ethnic minority backgrounds were not recruited, as the intervention did not adequately reach these communities due to limited cultural sensitivity in the vulnerability assessment and support offers. Midwives and health visitors reported language barriers, challenges using interpreters, and differing cultural understandings of parenthood, reflecting issues widely described in the literature (Sharma et al., 2023; Thomson et al., 2022). Consequently, these parents could not be included in the evaluation. Parents with disclosed experiences of intimate partner violence were also not included. Future research should examine how the intervention functions for more diverse parent populations.

5. Conclusion

This study provides in-depth explanations of how, for whom and under what circumstances a cross-sectoral assessment and support intervention work to identify and support parents in vulnerable positions. By exploring the retrospective perspective of parents of ethnic Danish background in a variety of vulnerable positions who have participated in the intervention, we identified critical contextual factors and mechanisms contributing to the intervention's effects on parents' coping abilities and parenting skills.

We found that the intervention holds a significant potential to achieve its goals when it successfully engages parents in supportive dialogue about their vulnerabilities and transition into parenthood. The central mechanisms for this engagement to happen are embedded in a professional approach based on compassion, acceptance, a dual focus on the parents' resources and vulnerabilities and family-centeredness. These mechanisms create a sense of safety and trust, enabling parents to engage meaningfully with support services. Key contextual factors facilitating these mechanisms are time and professional experience and confidence in delivery of the intervention and establishment of integrated collaborative practices across services. This helped create comprehensive safety nets for parents at both local and regional levels, ensuring tailored services and coherent care.

Overall, this study highlights the importance of aligning cross-sectoral design and professional approaches with the unique needs of parents in vulnerable positions. These insights contributed to a theoretical foundation for the intervention that was otherwise lacking along with actionable guidance for enhancing the design and implementation of cross-sectoral interventions aimed at improving parental coping and caregiving capacities.

CRedit authorship contribution statement

Louise Lund Holm Thomsen: Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Marianne Stistrup Frederiksen:** Writing – review & editing, Validation, Formal analysis. **Clara Graugaard Andersen:** Writing – review & editing, Visualization, Validation, Formal analysis. **Rhiannon Evans:** Writing – review & editing, Validation, Methodology. **Charlotte Overgaard:** Writing – review & editing, Validation, Methodology, Funding acquisition, Formal analysis, Conceptualization.

Ethical statement

Our study did not require ethical board approval because it did not directly involve humans or animals.

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Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work the author(s) used Co-pilot to refine language and formulations. After using this tool/service, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the published article.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

Andersen, C. G., Thomsen, L. L. H., Gram, P., & Overgaard, C. (2023). 'It's about developing a trustful relationship': A Realist Evaluation of midwives' relational

- competencies and confidence in a Danish antenatal psychosocial assessment programme. *Midwifery*, 122, Article 103675. <https://doi.org/10.1016/j.midw.2023.103675>
- Bhaskar, R. (2013). *A realist theory of science* (0 ed.). Routledge. <https://doi.org/10.4324/9780203090732>
- Bjørnhoft, M., & Farstad, G. R. (2014). 'Am I rambling?' on the advantages of interviewing couples together. *Qualitative Research*, 14(1), 3–19. <https://doi.org/10.1177/1468794112459671>
- Bonell, C., Jamal, F., Melendez-Torres, G. J., & Cummins, S. (2015). 'Dark logic': Theorising the harmful consequences of public health interventions. *Journal of Epidemiology & Community Health*, 69(1), 95–98. <https://doi.org/10.1136/jech-2014-204671>
- Brygger Venø, L., Pedersen, L. B., Søndergaard, J., Ertmann, R. K., & Jarbøl, D. E. (2022). Assessing and addressing vulnerability in pregnancy: General practitioners perceived barriers and facilitators - A qualitative interview study. *BMC Primary Care*, 23(1), 142. <https://doi.org/10.1186/s12875-022-01708-9>
- D'Amour, D., Goulet, L., Labadie, J.-F., Martín-Rodríguez, L. S., & Pineault, R. (2008). A model and typology of collaboration between professionals in healthcare organizations. *BMC Health Services Research*, 8(1), 188. <https://doi.org/10.1186/1472-6963-8-188>
- D'haenens, F., Helsloot, K., Lauwaert, K., Agache, L., De Velde, G. V., De Frène, V., Embo, M., Vermeulen, J., Beeckman, K., & Fobelets, M. (2020). Towards an integrated perinatal care pathway for vulnerable women: The development and validation of quality indicators. *Midwifery*, 89, Article 102794. <https://doi.org/10.1016/j.midw.2020.102794>
- Darwin, Z., Domoney, J., Iles, J., Bristow, F., Siew, J., & Sethna, V. (2021). Assessing the mental health of fathers, other Co-parents, and partners in the perinatal period: Mixed methods evidence synthesis. *Frontiers in Psychiatry*, 11, Article 585479. <https://doi.org/10.3389/fpsy.2020.585479>
- De Graaf, J. P., Steegers, E. A. P., & Bonsel, G. J. (2013). Inequalities in perinatal and maternal health. *Current Opinion in Obstetrics and Gynecology*, 25(2), 98–108. <https://doi.org/10.1097/GCO.0b013e32835ec9b0>
- De Groot, N., Bonsel, G. J., Birnie, E., & Valentine, N. B. (2019). Towards a universal concept of vulnerability: Broadening the evidence from the elderly to perinatal health using a Delphi approach. *PLoS One*, 14(2), Article e0212633. <https://doi.org/10.1371/journal.pone.0212633>
- Dempsey, L., Dowling, M., Larkin, P., & Murphy, K. (2016). Sensitive interviewing in qualitative research. *Research in Nursing & Health*, 39(6), 480–490. <https://doi.org/10.1002/nur.21743>
- Downe, S., Finlayson, K., Walsh, D., & Lavender, T. (2009). Weighing up and balancing out: A meta-synthesis of barriers to antenatal care for marginalised women in high-income countries. *BJOG: An International Journal of Obstetrics and Gynaecology*, 116(4), 518–529. <https://doi.org/10.1111/j.1471-0528.2008.02067.x>
- Ebert, L., Bellchambers, H., Ferguson, A., & Browne, J. (2014). Socially disadvantaged women's views of barriers to feeling safe to engage in decision-making in maternity care. *Women and Birth*, 27(2), 132–137. <https://doi.org/10.1016/j.wombi.2013.11.003>
- Ellehave, S. M., Thomsen, L. L. H., Frederiksen, M. S., & Overgaard, C. (2023). Initial programme theory development: The first step in a realist evaluation of a cross-sectoral intervention for expectant Danish parents living with psychosocial risks. *PLoS One*, 18(12), Article e0295378. <https://doi.org/10.1371/journal.pone.0295378>
- European Parliament and of the Council. (2016). Regulation (EU) 2016/679 of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing directive 95/46/EC (general data protection regulation). *Official Journal of the European Communities* [Internet]. OJ L 119/1:1–88. Last seen 01.05.2026 <http://data.europa.eu/eli/reg/2016/679/oj>
- Feijen-de Jong, E. I., Warmelink, J. C., Van Der Stouwe, R. A., Dalmaijer, M., & Jansen, D. E. M. C. (2022). Interventions for vulnerable pregnant women: Factors influencing culturally appropriate implementation according to health professionals: A qualitative study. *PLoS One*, 17(8), Article e0272249. <https://doi.org/10.1371/journal.pone.0272249>
- Frederiksen, M. S., Schmied, V., & Overgaard, C. (2021a). Living with fear: Experiences of Danish parents in vulnerable positions during pregnancy and in the postnatal period. *Qualitative Health Research*, 31(3), 564–577. <https://doi.org/10.1177/1049732320978206>
- Frederiksen, M. S., Schmied, V., & Overgaard, C. (2021b). Supportive encounters during pregnancy and the postnatal period: An ethnographic study of care experiences of parents in a vulnerable position. *Journal of Clinical Nursing*, 30(15–16), 2386–2398. <https://doi.org/10.1111/jocn.15778>
- Frederiksen, M. S., Schmied, V., & Overgaard, C. (2023). Creating coherent perinatal care journeys: An ethnographic study of the role of continuity of care for Danish parents in a vulnerable position. *Women and Birth*, 36(1), 117–126. <https://doi.org/10.1016/j.wombi.2022.03.009>
- Funnell, S. C., & Rogers, P. J. (2011). *Purposeful program theory: Effective use of theories of change and logic models*. Jossey-Bass.
- Gilmore, B., McAuliffe, E., Power, J., & Vallières, F. (2019). Data analysis and synthesis within a realist evaluation: Toward more transparent methodological approaches. *International Journal of Qualitative Methods*, 18, Article 1609406919859754. <https://doi.org/10.1177/1609406919859754>
- Gram, P., Andersen, C. G., Petersen, K. S., Frederiksen, M. S., Thomsen, L. L. H., & Overgaard, C. (2024). Identifying psychosocial vulnerabilities in pregnancy: A mixed-method systematic review of the knowledge base of antenatal conversational psychosocial assessment tools. *Midwifery*, 136, Article 104066. <https://doi.org/10.1016/j.midw.2024.104066>
- Gram, P., Thomsen, L. L. H., Andersen, C. G., & Overgaard, C. (2023). Trusting parent-professional relationships in interprofessional interventions for expectant and new parents in vulnerable positions: A realist evaluation. *Journal of Interprofessional Care*, 1–11. <https://doi.org/10.1080/13561820.2023.2183185>. ahead-of-print.
- Harrison, P. A., Godecker, A., & Sidebottom, A. C. (2011). Psychosocial risk screening during pregnancy: Additional risks identified during a second interview. *Journal of Health Care for the Poor and Underserved*, 22(4), 1344–1357. <https://doi.org/10.1353/hpu.2011.0122>
- Harron, K., Gilbert, R., Fagg, J., Guttman, A., & Meulen, J. van der (2021). Associations between pre-pregnancy psychosocial risk factors and infant outcomes: A population-based cohort study in England. *The Lancet Public Health*, 6(2), e97–e105. [https://doi.org/10.1016/S2468-2667\(20\)30210-3](https://doi.org/10.1016/S2468-2667(20)30210-3)
- Hillard, P. J. A. (2022). Trauma-informed care in pediatric and adolescent gynecology. *Journal of Pediatric and Adolescent Gynecology*, 35(1), 1–2. <https://doi.org/10.1016/j.jpag.2021.12.002>
- Isobel, S. (2023). Trauma and the perinatal period: A review of the theory and practice of trauma-sensitive interactions for nurses and midwives. *Nursing Open*, 10(12), 7585–7595. <https://doi.org/10.1002/nop.2107>
- Jackson, S. F., & Kolla, G. (2012). A new realistic evaluation analysis method: Linked coding of context, mechanism, and outcome relationships. *American Journal of Evaluation*, 33(3), 339–349. <https://doi.org/10.1177/1098214012440030>
- Jagosh, J. (2020). Retroductive theorizing in Pawson and Tilley's applied scientific realism. *Journal of Critical Realism*, 19(2), 121–130. <https://doi.org/10.1080/14767430.2020.1723301>
- Jakobsen, S. P., & Overgaard, C. (2018). 'They'll be judging us' a qualitative study of pregnant women's experience of being offered participation in a supportive intervention. *Midwifery*, 61, 81–87. <https://doi.org/10.1016/j.midw.2018.02.017>
- Johnsen, H., Clausen, J. A., Hvidtjørn, D., Juhl, M., & Hegaard, H. K. (2018). Women's experiences of self-reporting health online prior to their first midwifery visit: A qualitative study. *Women and Birth*, 31(2), e105–e114. <https://doi.org/10.1016/j.wombi.2017.07.013>
- Jones, G. L., Mitchell, C. A., Hirst, J. E., Anumba, D. O. C., & the Royal College of Obstetricians and Gynaecologists. (2022). Understanding the relationship between social determinants of health and maternal mortality. *BJOG: An International Journal of Obstetrics & Gynaecology*, 129(7), 1211–1228. <https://doi.org/10.1111/1471-0528.17044>
- King, C. (2018). 'It depends what you class as vulnerable': Risk discourse and the framing of vulnerability in health visiting policy and practice. *Families, Relationships and Societies*, 7(1), 39–54. <https://doi.org/10.1332/204674316X14651146433955>
- Klode, K., Ringer, A., & Hølge-Hazelton, B. (2020). Interprofessional and intersectoral collaboration in the care of vulnerable pregnant women: An interpretive study. *Journal of Interprofessional Care*, 1–10. <https://doi.org/10.1080/13561820.2020.1761306>
- Knudsen, C. K., Christesen, A. M. S., Heuckendorff, S., Fonager, K., Johansen, M. N., & Overgaard, C. (2021). The risk of preterm birth in combinations of socioeconomic position and mental health conditions in different age groups: A Danish nationwide register-based cohort study. *BMC Pregnancy and Childbirth*, 21(1), 696. <https://doi.org/10.1186/s12884-021-04138-0>
- Kramer, M. S. (2015). Socioeconomic disparities in preterm birth. *Paediatric & Perinatal Epidemiology*, 29(3), 169–171. <https://doi.org/10.1111/ppe.12186>
- Mackintosh, I., Reed, S., & Jayakody, S. (2024). A systematic review of the perinatal mental health outcomes of women with neurodevelopmental disorders. *BJPsych Open*, 10(S1), S59–S60. <https://doi.org/10.1192/bjo.2024.200>
- Manzano, A. (2016). The craft of interviewing in realist evaluation. *Evaluation*, 22(3), 342–360. <https://doi.org/10.1177/1356389016638615>
- Megnín-Viggars, O., Symington, I., Howard, L. M., & Pilling, S. (2015). Experience of care for mental health problems in the antenatal or postnatal period for women in the UK: A systematic review and meta-synthesis of qualitative research. *Archives of Women's Mental Health*, 18(6), 745–759. <https://doi.org/10.1007/s00737-015-0548-6>
- Mellor, R. M., Slaymaker, E., & Cleland, J. (2013). Recognizing and overcoming challenges of couple interview research. *Qualitative Health Research*, 23(10), 1399–1407. <https://doi.org/10.1177/1049732313506963>
- Ménage, D., Bailey, E., Lees, S., & Coad, J. (2017). A concept analysis of compassionate midwifery. *Journal of Advanced Nursing*, 73(3), 558–573. <https://doi.org/10.1111/jan.13214>
- Morrison, J., Pikhart, H., Ruiz, M., & Goldblatt, P. (2014). Systematic review of parenting interventions in European countries aiming to reduce social inequalities in children's health and development. *BMC Public Health*, 14. <https://doi.org/10.1186/1471-2458-14-1040%2520%255Bdoi%255D%255D>, 1040–1040.
- Mukumbang, F. C., Marchal, B., Van Belle, S., & Van Wyk, B. (2020). Using the realist interview approach to maintain theoretical awareness in realist studies. *Qualitative Research*, 20(4), 485–515. <https://doi.org/10.1177/1468794119881985>
- Mukumbang, F. C., Souza, D. E. D., & Eastwood, J. G. (2023). The contributions of scientific realism and critical realism to realist evaluation. *Journal of Critical Realism*, 22(3), 504–524. <https://doi.org/10.1080/14767430.2023.2217052>
- Mule, V., Reilly, N. M., Schmied, V., Kingston, D., & Austin, M.-P. V. (2022). Why do some pregnant women not fully disclose at comprehensive psychosocial assessment with their midwife? *Women and Birth: Journal of the Australian College of Midwives*, 35(1), 80–86. <https://doi.org/10.1016/j.wombi.2021.03.001>
- National Committee on Health Research Ethics. (2018). *Act on research ethics review of health research projects*. <https://www.vienskabsetik.dk/ansoegning-til-etisk-komite/overblik-over-anmeldelsespligten>. Last seen 01.05.2026.
- NICE, N. I. for H. and C. E.. (2010). Pregnancy and complex social factors: A model for service provision for pregnant women with complex social factors (p. 29).

- (downloaded 07.05.2025) <https://www.nice.org.uk/guidance/cg110/resources/pregnancy-and-complex-social-factors-a-model-for-service-provision-for-pregnant-women-with-complex-social-factors-pdf-35109382718149>.
- Noonan, M., Jomeen, J., Galvin, R., & Doody, O. (2018). Survey of midwives' perinatal mental health knowledge, confidence, attitudes and learning needs. *Women and Birth: Journal of the Australian College of Midwives*, 31(6), e358–e366. <https://doi.org/10.1016/j.wombi.2018.02.002>
- Origlia, P., Jevitt, C., Sayn-Wittgenstein, F. zu, & Cignacco, E. (2017). Experiences of antenatal care among women who are socioeconomically deprived in high-income industrialized countries: An integrative review. *Journal of Midwifery & Women's Health; J Midwifery Womens Health*, 62(5), 589–598. <https://doi.org/10.1111/jmwh.12627>
- Pawson, R. (1996). Theorizing the interview. *British Journal of Sociology*, 47(2), 295. <https://doi.org/10.2307/591728>
- Pawson, R., & Tilley, N. (1997). *Realistic evaluation*. Sage.
- Pierron, A., Fond-Harmant, L., Laurent, A., & Alla, F. (2018). Supporting parenting to address social inequalities in health: A synthesis of systematic reviews. *BMC Public Health*, 18(1). <https://doi.org/10.1186/s12889-018-5915-6%2520%255Bdoi%255D, 1087–6>.
- Posthumus, A. G., Birnie, E., Veen, M. J. van, Steegers, E. A. P., & Bonsel, G. J. (2016). An antenatal prediction model for adverse birth outcomes in an urban population: The contribution of medical and non-medical risks. *Midwifery*, 38, 78–86. <https://doi.org/10.1016/j.midw.2015.11.006>
- Radley-Gardner, O., Beale, H., & Zimmermann, R. (Eds.). (2016). *Fundamental texts on European private law*. Hart Publishing. <https://doi.org/10.5040/9781782258674>.
- Rayment-Jones, H., Harris, J., Harden, A., Khan, Z., & Sandall, J. (2019). How do women with social risk factors experience United Kingdom maternity care? A realist synthesis. *Birth*, 46(3), 461–474. <https://doi.org/10.1111/birt.12446>
- Reid, R., Haggerty, J., & McKendry, R. (2002). *Defusing the confusion: Concepts and measures of continuity of health care*. Centre for Health services and policy research. University of British Columbia.
- Rollans, M., Schmied, V., Kemp, L., & Meade, T. (2013). Digging over that old ground: An Australian perspective of women's experience of psychosocial assessment and depression screening in pregnancy and following birth. *BMC Women's Health*, 13(1), 18. <https://doi.org/10.1186/1472-6874-13-18>
- Rosenwein, S. V., Kierkegaard, L., Kusier, A. O., Lassen, T. H., Ammitzbøll, J., & Pedersen, T. P. (2020). *Betydning af gravides mentale helbred for barnet i de første leveår*. Statens Institut for Folkesundhed, Syddansk Universitet for Sundhedsstyrelsen. <https://www.sst.dk/da/Nyheder/2021/Hvad-betyder-gravide-s-mentale-helbred-for-barnets-foerste-levaar> (downloaded 07.05.2025).
- Rudkjøbing, A., Strandberg-Larsen, M., Vrangbæk, K., Sahl Andersen, J., & Krasnik, A. (2014). Health care agreements as a tool for coordinating health and social services. *International Journal of Integrated Care*, 14(4). <https://doi.org/10.5334/ijic.1452>
- Scheele, J., Harmsen van der Vliet-Torij, H. W., Wingelaar-Loomans, E. M., & Goumans, M. J. B. M. (2020). Defining vulnerability in European pregnant women, a Delphi study. *Midwifery*, 86, Article 102708. <https://doi.org/10.1016/j.midw.2020.102708>
- Schmied, V., Reilly, N., Black, E., Kingston, D., Talcevska, K., Mule, V., & Austin, M.-P. (2020). Opening the door: Midwives' perceptions of two models of psychosocial assessment in pregnancy- a mixed methods study. *BMC Pregnancy and Childbirth*, 20(1), 451. <https://doi.org/10.1186/s12884-020-03133-1>
- Sharma, E., Tseng, P.-C., Harden, A., Li, L., & Puthussery, S. (2023). Ethnic minority women's experiences of accessing antenatal care in high income European countries: A systematic review. *BMC Health Services Research*, 23(1), 612. <https://doi.org/10.1186/s12913-023-09536-y>
- Shearn, K., et al. (2017). Building realist program theory for large complex and messy interventions. *International Journal of Qualitative Methods*, 16(1). <https://doi.org/10.1177/1609406917741796>
- Sperlich, M., Seng, J. S., Li, Y., Taylor, J., & Bradbury-Jones, C. (2017). Integrating trauma-informed care into maternity care practice: Conceptual and practical issues. *Journal of Midwifery & Women's Health*, 62(6), 661–672. <https://doi.org/10.1111/jmwh.12674>
- Spiers, J. (2000). New perspectives on vulnerability using emic and etic approaches. *Journal of Advanced Nursing*, 31(3), 715–721. <https://doi.org/10.1046/j.1365-2648.2000.01328.x>
- Sule, F. A., Uthman, O. A., Olamijuwon, E. O., Ichegbo, N. K., Mgbachi, I. C., Okusanya, B., & Makinde, O. A. (2022). Examining vulnerability and resilience in maternal, newborn and child health through a gender lens in low-income and middle-income countries: A scoping review. *BMJ Global Health; BMJ Glob Health*, 7(4), Article e007426. <https://doi.org/10.1136/bmjgh-2021-007426>
- Tambelli, R., Trentini, C., Trovato, A., & Volpi, B. (2019). Role of psychosocial risk factors in predicting maternal and paternal depressive symptomatology during pregnancy. *Infant Mental Health Journal*, 40(4), 541–556. <https://doi.org/10.1002/imhj.21791>
- The Danish Ministry of Health, S. (2021). *Recommendation for maternity care [Anbefalinger for svangreomsorgen]* https://www.sst.dk/-/media/Udgivelser/2021/Anbefalinger-svangreomsorgen/Svangreomsorg-2022-ny.ashx?sc_lang=da&hash=F89081C3D9BCBF3367F0098F1961FF89.
- Thomson, G., Cook, J., Crossland, N., Balaam, M.-C., Byrom, A., Jassat, R., & Gerrard, S. (2022). Minoritised ethnic women's experiences of inequities and discrimination in maternity services in North-West England: A mixed-methods study. *BMC Pregnancy and Childbirth*, 22(1), 958. <https://doi.org/10.1186/s12884-022-05279-6>
- Tilly, N. (2018). The middle-range methodology of realist evaluation: Forty years with realist ray and their unintended consequences, an affectionate and unfinished middle-range story. In N. Emmel, J. Greenhalgh, A. Manzano, M. Monaghan, & S. Dalkin (Eds.), *Doing realist research* (pp. 15–24). SAGE Publications Ltd. <https://doi.org/10.4135/9781526451729.n2>.
- Turienzo, C. F., Rayment-Jones, H., Roe, Y., Silverio, S. A., Coxon, K., Shennan, A. H., & Sandall, J. (2021). A realist review to explore how midwifery continuity of care may influence preterm birth in pregnant women. *Birth*, 48(3), 375–388. <https://doi.org/10.1111/birt.12547>
- Vlassak, E., Bessems, K., & Gubbels, J. (2022). The experiences of midwives in caring for vulnerable pregnant women in the Netherlands: A qualitative cross-sectional study. *Healthcare*, 11(1), 130. <https://doi.org/10.3390/healthcare11010130>
- WHO, W. H. O. (2016). WHO recommendations on antenatal care for a positive pregnancy experience. <https://iris.who.int/bitstream/handle/10665/250796/9789241549912-eng.pdf?sequence=1>. downloaded 07.05.2025.
- WHO. (2018). *Continuity and coordination of care A practice brief to support implementation of the WHO framework on integrated people-centred health services*. WHO. <https://apps.who.int/iris/handle/10665/274628>. downloaded 07.05.2025.
- Williams, M. (2018). Making up mechanisms in realist research. In N. Emmel, J. Greenhalgh, A. Manzano, M. Monaghan, & S. Dalkin (Eds.), *Making up mechanisms in realist research* (pp. 25–40). SAGE Publications Ltd. <https://doi.org/10.4135/9781526451729.n3>.
- World Medical Association Declaration of Helsinki. (2013). Ethical principles for medical research involving human subjects. *JAMA*, 310(20), 2191. <https://doi.org/10.1001/jama.2013.281053>
- Zarhin, D. (2018). Conducting joint interviews with couples: Ethical and methodological challenges. *Qualitative Health Research*, 28(5), 844–854. <https://doi.org/10.1177/1049732317749196>