



**Factors affecting body weight in boys in primary school,
Makkah, Saudi Arabia: A comparative case study**

Ahmed Saleh Alghamdi

School of Healthcare Sciences

College of Biomedical and Life Sciences, Cardiff University

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SUMMARY

Childhood is an important period for determining long-term health in life. One of the biggest threats facing children is obesity. Globally, childhood obesity is reaching the level of a serious public health concern. In some countries, rates of obesity have more than doubled in the last two decades. For example, in Saudi Arabia a recent national study of 11,112 children aged from 2-7 years found the prevalence of obesity among Saudi children has almost doubled since 2002. Global literature shows that obesity is a complex issue and that many factors contribute to children becoming overweight. From a review of the Saudi literature, it is clear that no previous study has used observation as a research methodology to explore the factors affecting body weight in Saudi schools and this is the first study completed within the Islamic school context.

The aim of this study was to explore factors that affect body weight among boys in three types of school in Saudi Arabia (public, Islamic and private). A case study design and qualitative methods were adopted. Data were generated through observations, interviews with teachers and students, and by analysing documents. Three research committees from Cardiff University and the Saudi Ministry of Education approved the study. The total interviewees numbered 33 students and 18 teachers. The data analysis process was thematic and used inductive techniques, findings across all cases are presented under four major themes.

The school's system and philosophy play a significant role in affecting body weight among Saudi boys in primary schools. This theme includes the teacher's role, school canteen system, school programmes and the role of the Ministry of Education. For example, in the public and Islamic schools, canteens are important source of income and this directs each school to sell to students what they want regardless of its nutritional value. The school environment, its infrastructure and facilities was the second theme. Unlike the private school, the public and Islamic schools benefited from new, appropriate, designs. Both these two schools have outdoor sports facilities but they are not prepared to maintain and continue physical education lessons in extreme weather conditions. The students' health behaviours are a further factor affecting body weight among Saudi boys at all types of primary school. This theme includes students' preferences, society and community. Three factors that exist outside schools can also affect students' body weight at all types of primary school. These are media, family, and languages. Drawing on these themes, recommendations are made for policy, practice and research.

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DEDICATION:

This thesis is dedicated to my mother

Saleha Alghamdi (may ALLAH bless her soul)

04-07-1943 to 04-02-2016

who inspired and encouraged me throughout my life; but unfortunately she passed away last year. I miss you mother very much and I will not forget your beloved soul and your concern. I promise you that I will continue to achieve success in my life and career as you wished and as you were proud of.

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CONFERENCE AND TRAINING:

1. In 23/05/2017, Considering Adaptation In School-Based Health Promotion Interventions: Cultural Grounding Curricula For Nicaragua, Central America, Cardiff University.
2. In 15/05/2017, The Good Viva Video (Online Course), Cardiff University.
3. In 08/05/2017, Healthcare Seminar, Cardiff University.
4. In 19/04/2017, National Obesity Conference: Obesity: Tipping Back the Scales of the Nation, Manchester.
5. In 17/11/2016, The Annual Postgraduate Symposium shared in presentation, Cardiff University.
6. In 05/07/2016, Telling Our Own Stories: Disabled and non-Disabled Children and Young People Shaping Change, Cardiff University.
7. In 25/04/2016, A symposium titled 'Innovative Research Methods with Children and Young People', the School of Social Sciences, Cardiff University.
8. In 14/03/2016, Writing for publication workshops, Cardiff University.
9. In 13-14/02/2016, The 9th Saudi Student Conference in UK, Saudi Arabian Cultural Bureau, Birmingham.
10. In 18/01/2016, Turbocharge Your Writing, Cardiff University.
11. In 18/03/2015, PhD Comics: 'The Power of Procrastination', Cardiff University.
12. In 2013, Certificate of Professional Development Communication.
13. In 2013, Certificate of Professional Development Personal Effectiveness.
14. In 19/11/2013, The Annual Postgraduate Symposium shared in poster, Cardiff University.
15. In 28/05/2013, Mock Viva (Humanities and Social Sciences), Cardiff University.
16. In 15-16/04/2013, Effective Researcher, Cardiff University.

17. In 15-20/03/2013, English for Research Writing (for non-native speakers of English), Cardiff University.
18. In 13/02/2013, Seven Secrets of Highly Successful Researchers, Cardiff University.
19. In 11/02/2013, Writing a Literature Review, Cardiff University.
20. In 24/01/2013, Researcher Development Framework - Part Two: Evidencing Your Skills for Employers, Cardiff University.
21. In 07/12/2012, Writing a Literature Review, Cardiff University.
22. In 27/11/2012, Critical Appraisal of Research Papers: Qualitative, Cardiff University.
23. In 15/11/2012, Word: Working with Long Documents, Microsoft, Cardiff University.
24. In 29/10/2012, Planning and Writing Your Thesis, Microsoft, Cardiff University.
25. In 09/10/2012, Starting Out: Induction Event for New Researchers, Cardiff University.
26. In 17/05/2012, Effective CV Writing, Cardiff University.
27. In 09/05/2012, Keeping Your Research Up-to-Date, Cardiff University.
28. In 28/02/2012, EndNote: Further Techniques for Managing your References, Cardiff University.
29. In 27/02/2012, Teaching Skills (Open Programme): Lecturing Skills, Cardiff University.
30. In 21/02/2012, Enterprising Researcher, Cardiff University.
31. In 21/02/2012, Researching/Writing a Literature Review in the Social Sciences: An Introduction, Cardiff University.
32. In 13/02/2012, Critical Appraisal of Research Papers: Qualitative, Cardiff University.

CHAPTER ONE: INTRODUCTION TO THE STUDY

Introduction

This is a unique study conducted in Makkah, Saudi Arabia to explore factors that affect body weight of boys in grade 6 aged 11-12 years. One of the biggest threats facing children in this age group is obesity. Obesity is a serious condition among children; it has spread worldwide. It is a risk factor for many of the diseases that affect the lives of children such as cardiovascular dysfunction (Cote et al., 2013). Recently, the Canadian and American Medical Associations stated that obesity is a chronic medical disease (Sharma and Campbell-Scherer, 2017). Children in Saudi Arabia are facing many factors that can affect their body weight and because they are in primary school for more than seven hours per day. It is very important to explore this further. Factors include increased sedentary lifestyles and poor nutrition, specifically when there is very limited study in this area. In Saudi Arabia there are three different types of primary schools and these schools may differ in their systems, availability of sports facilities and other factors that can affect students' body weight. So this study is a comparative case study of the three different types, which are public, private and Islamic schools.

This chapter is an overview and will provide an insight into body weight amongst children throughout the world. The chapter will provide a background to the causes of obesity by drawing on the *Foresight Tackling Obesities: Future Choices – Project Report* which is a project sponsored by the Department of Health in the UK gathered by many experts and using much scientific evidence to formulate a strategic view of obesity and to use it as a model to predict obesity levels over the next 40 years (Butland et al., 2007). As this project is based on scientific knowledge and created from an understanding of the links between factors affecting obesity levels, it can help to explain the factors affecting body weight in

Saudi Arabia. This chapter will include an overview of body weight among children in Saudi Arabia. It also includes an overview of Saudi Arabia, the education system in the country, the Ministry of Education, and the aims of primary schools. Then it sets out the research problem, the study aim and the objectives. The chapter will end by explaining the structure of this thesis.

Overview of body weight among children

Body weight is measured by calculation of body mass index (BMI), which is the weight in kilograms divided by the square of the height in metres. A children is classed as overweight when their BMI score equals 25 or higher and a result of 30 or higher is classified as obese (WHO, 2006). Globally, childhood obesity is reaching the level of a serious public health concern (Esquivel et al., 2016; Utter et al., 2015). In some countries the rates of obesity have more than doubled in the last two decades; for example, the prevalence of obesity among US children rose from 5.1% in 1974 to 17.1% in 2004 (Ogden et al., 2007). Recently, the evidence shows that the prevalence of obesity continues to increase among children in the USA (Skinner et al., 2016). In England around 10% of children are obese and 20–25% of children are overweight. Moreover, more than 50% of adults in the UK and approximately 25% of under 20 years olds could be obese by 2050 (Butland et al., 2007). Obesity has also increased among children in Asia, the Western Pacific and the Eastern Mediterranean region. In China around 11% of children are obese (Wang et al., 2002).

Obese children face an increased risk of a wide range of chronic diseases such as diabetes, and these diseases can negatively affect children's well-being and quality of life (Williams et al., 2012). According to the WHO (2009) there are five global risks of death in the world, two of them are physical inactivity which accounts for 6% of global deaths and being overweight with 5%. Moreover, an increase in the level of obesity in the population requires an increase in the healthcare budget because of obesity complications and treatments. The increased

rate of obesity in any country is a major challenge for healthcare and public health as well as governments and decision makers. Therefore, governments in many countries have classified obesity as a public health concern and made it their country's health priority. For example, many decision-makers from various European countries recommended tackling obesity nationally and internationally (Butland et al., 2007). However, most countries of the Eastern Mediterranean region have no clear strategy to promote healthy diets and physical activity (WHO, 2010a).

Many health problems are caused by multiple risk factors. That means the exploration of the disease and the intervention strategy should cover risk factors around the particular health problem. For example, the Foresight Obesity System Map identifies seven themes regarding causes of obesity, these are the physiology cluster, the individual activity cluster, the physical activity environment cluster, the food consumption cluster, the food production cluster, the individual psychology cluster and the social psychology cluster (Butland et al., 2007). Table 1:1 lists all clusters with their factors. Understanding each theme can help to establish a comprehensive strategy for tackling obesity. For example, the first cluster in the table below social psychology. This cluster has an impact at the family level, such as 'parental control'. It also includes variables related to food advertising such as 'TV watching', 'media availability' and 'media consumption'.

Table1.1: The seven obesity thematic clusters with their variables

based on (Butland et al., 2007)

The social psychology cluster	The individual activity cluster	The physical activity environment cluster	The food production cluster	The physiology cluster	The individual psychology cluster	The food consumption cluster
Exposure to food Advertising, TV watching, Perceived lack of time, Parental control, entertainment option, Media consumption, media availability. Importance of ideal body size image, Social acceptability, Peer pressure. Education.	Learned activity patterns in early childhood, Degree of innate activity in childhood, Degree of physical education, Level of recreational activity, Level of domestic activity, Level of transport activity.	Opportunity for team-based activity, Perceived danger in environment, Access to opportunity for physical exercises, Cost of physical exercise, Walk ability of living environment, Opportunity for un-motorised transport.	Societal pressure to consume, Effort to increase efficiency of consumption, Desire to minimise cost, Pressure to improve access to food offerings, Cost of ingredients, Market price of food offerings, Purchasing power.	Importance of physical need, Genetic and or epigenetic predisposition to obesity, Appropriateness of child growth, Quality & Quantity, Level of safety, Extent of digestion & absorption	Use of medicines, Self-Esteem, Social interaction, Stress, level of children's control of diet, level of parental control.	Food exposure, Food abundance, Convenience of food offering, Food variety, Palatability of food offering, Force of dietary habits, Rate of eating, Nutritional quality, Fibre content of food.

According to Jaime and Lock (2009) reviews of the evidence mentioned that some school policies for tackling obesity can improve the situation; however, reviews of interventions tackling obesity in schools recommend changes to the wider school context for success. For example, an intervention tackling obesity among schools children should engage the wider school context such as the education system, school food marketing, teaching methods and outside-school physical activities. These actions will be more effective than focusing on each student separately (Butland et al., 2007). Therefore, the seven themes from the obesity map, which are the individual activity cluster, the physical activity environment cluster, the food consumption cluster, the food production cluster, the individual psychology cluster, the social psychology cluster, and the physiology cluster, can be useful to framework and

guidance obesity and its complexity in this study. However, the present study excluded the physiological cluster because it is beyond the scope of the study.

Overview of body weight among children in Saudi Arabia

The population of the Kingdom of Saudi Arabia grew at an annual average rate of 3.2% between 2004 and 2010 and the latest census of 2010 found that the Saudi population was around 30 million (CDSI, 2010). Children accounted for 28.8 % of the Saudi population, the majority of them in primary schools. However, limited national studies have been carried out to determine the prevalence of obesity among children in Saudi Arabia, as shown in Table 1.2 below. This study focused on students in grade (6) which means their age is less than 12 years old.

Table1.2: National studies of obesity in Saudi children

The Authors	Location	Sample ages	Sample size	Gender	Obesity
Al-Nuaim et al. (1996)	National	6-18	9061	M	15.8%
El-Hazmi and Warsy (2002)	National	1-18	12701	M	5.98%
				F	6.7%
El Mouzan et al. (2010)	National	5-18	19317	M	10.1%
				F	8.4%
El Mouzan et al. (2012)	National	2-17	11112	M	8.6%
				F	7.6%

El Mouzan et al. (2010) found that obesity had increased more among boys than girls. A national household screening programme was conducted to explore obesity in children. The study reported that the percentage of obesity was 5.98% and 6.7% in boys and girls respectively (El-Hazmi and Warsy, 2002). In 2012, the national study analysis of 11,112 children aged from 2-7 years found that the prevalence of obesity among Saudi children has increased sharply since the national study in 2002.

The research problem

Childhood is an important period for determining long-term health in life. The children of today are the future adult generation so it is important to acknowledge the evidence that certain medical disorders in early life can affect their later life. One of the biggest threats facing children is obesity. Obesity is defined as the presence of an excessive accumulation of fatty tissue in the body (Park, 2002), and there is sufficient evidence that an increase in fat in the human body increases the risk of many diseases. Many countries now consider the incidence of obesity as an epidemic (Boulos et al., 2012; El-Hazmi and Warsy, 2002a; Wang, 2001) and a variety of studies show that obesity is a serious public health issue (Dinour, 2015; Chan and Woo, 2010; Al-Dossary et al., 2010a; Baskin et al., 2005; Al-Shammari et al., 2001). Many studies argue that obesity in children tends to lead to them becoming obese adults (Simmonds et al., 2016; Kotchen, 2010; El-Hazmi and Warsy, 2002a; Bygdell et al., 2017). So the fact is that obesity is a serious condition among children; it has spread significantly all over the world. It is a risk factor for many of the diseases that affect the lives of children (Williams et al., 2012), while some medical professionals have described this current situation as an “obesity crisis” (Carr and Friedman, 2005).

Children of school age spend more than seven hours a day at school, five days per week. During this time at school, children take part in different activities, such as sitting for long periods learning in classes, eating breakfast, playing, and walking or racing with friends. In general, Saudi Arabian primary schools fall in to three classifications – public schools, Islamic schools and private schools – these may have different rules and regulations. Moreover, these classifications may be different with regard to school curricula, facilities, systems and teachers’ roles. These schools are also different with regard to government support and control. Some school categories have good facilities which encourage children to undertake physical activities and to eat healthy food, while other categories may not, and this can have

a direct effect on children's health. Moreover, for many years, the Ministry of Education in Saudi Arabia has had a department called the General Administration of School Health. This department is focused on students' health, such as dental hygiene and personal hygiene. This department had many problems such as shortages of manpower and a low number of branches to cover all schools. In 2012, the government decided to transfer the General Administration of School Health from the Ministry of Education to the Ministry of Health, there was a delay in the implementation this transfer and this created a gap between schools and healthcare.

The knowledge gap can be seen by the fact that the majority of studies that have been undertaken in Saudi Arabian schools examined the prevalence of obesity among students and no studies explored factors affecting body weight among primary school students. Also, there are no studies exploring and comparing the three types of schools: public, Islamic and private, in terms of factors that can affect body weight among Saudi children. Moreover, there are no studies of body weight among students in Islamic primary schools because obesity and its complexity need a deep understanding of the factors (Stanford and Kyle, 2015). So, this is the first study using qualitative methodology to explore factors affecting students' body weight in primary schools in Saudi Arabia.

It is important to explore the issues relating to health because primary schools in Saudi Arabia do not mention improving students' health care in their aims (MOE, 1995a). Therefore, health topics in the school curriculum are very limited and students' health is not a school's priority. Moreover, it is important to understand the current situation of the different types of schools in Saudi Arabia and the effect on children's health with regard to physical activities, healthy food and the school system. Also, teachers' information can provide further explanations and wider information about the school curriculum, facilities, system and their roles in terms of promoting healthy eating, the level of physical activities

and the factors that contribute to obesity. This may assist with understanding the growing obesity problem and schools' engagement with students' health.

Summary

From the above discussion on the most significant ages in the Saudi Arabian population report, it is seen that children are the second largest segment of the Saudi Arabian population and it is clear that obesity is a significant concern as illustrated by national studies. Children at primary school spend more than seven hours a day at school, five days per week. During this time at school, children are faced with many choices which can affect their body weight and the *Foresight Tackling Obesities: Future Choices* is useful to provide a framework and guidance on obesity and its complexity in this study. Saudi Arabian primary schools are of different types, with different rules and regulations. Therefore, Saudi Arabians could take decisive action to improve children's health status, and this study explores the different types of schools in terms of factors that can affect body weight among children in Saudi Arabia.

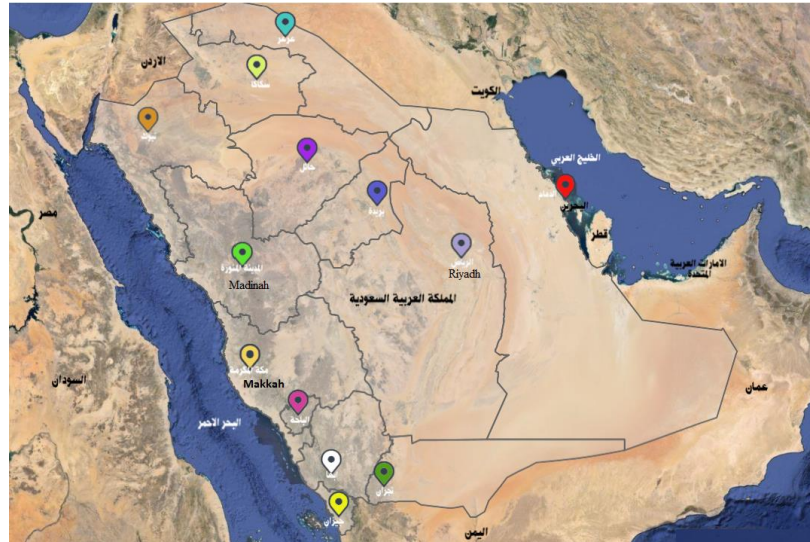
Overview of Saudi Arabia

Introduction

The Kingdom of Saudi Arabia is situated in the Arabian Peninsula and occupies most of that area. It covers around 200,000 square kilometres (CDSI, 2014b). It is bordered by Kuwait, Iraq and Jordan to the north, Yemen and Oman to the south, the Arabian Gulf, the Kingdom of Bahrain, Qatar and the United Arab Emirates to the east and the Red Sea to the west. There are many important cities such as Riyadh, which is the capital city, and Makkah and Madinah, the holy cities. Saudi Arabia is divided into 13 provinces and five regions (CDSI,

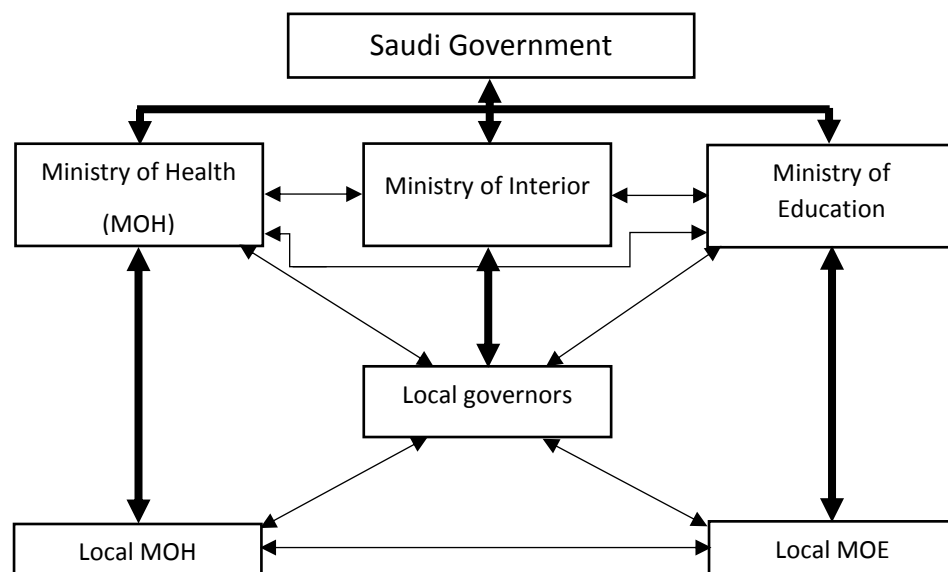
2014b). Each region has a capital city that administers the region; for example, the Makkah Region is led by the Makkah city governor (see figure 1.1).

Figure 1.1: Map of Saudi Arabia (Source: General Administration of Statistics)



However, local governors are limited authorities in regard to planning and finance because the Saudi Arabian government controls the decisions through many ministries such as the Ministry of Education, the Ministry of Health, the Ministry of Municipal and Rural Affairs and the Ministry of the Interior (see FIGURE 1.2).

FIGURE 1.2: Saudi government structure



As can be seen from the above diagram, the connection between the different ministries in the Saudi government is stronger than with local governors and this system sometimes causes conflicts of interest between the ministries, which affects the local governors. For example, the Ministry of Hajj and Umrah needs a new location for a project for pilgrims in Makkah, so the Ministry of Hajj and Umrah will choose a suitable site for the project in Makkah and the government will approve that decision. Therefore, all government and nongovernment sectors in that area will have to make difficult decisions as a matter of urgency and move to another area. For example, schools in that area will transfer to a new rented building or integrate with other schools in a nearby neighbourhood. This method of decision-making by the government became normal in the country especially in the two Holy cities.

In Saudi Arabia the weather is different from one region to another. However, in general, the weather is hot in summer and cold in winter. According to a report produced by the General Authority for Statistics the maximum temperature was 50 °C in Makkah and the lowest temperature was -7.8 °C in Hail (GaStat, 2015).

The Saudi Arabian education system

Historically, Saudi Arabia was established three times. The last time was in 1902 by King Abdul-Aziz bin Saud (1882-1953). In 1925, the Directorate of Knowledge was established as the first step towards an education system. In 1932, King Abdul-Aziz announced that he was integrating all the Saudi regions into what he called the Kingdom of Saudi Arabia (MOMRA, 2015). King Saud bin Abdul-Aziz (1902-1969) was the first son of King Abdul-Aziz and led the country after him; he developed the Directorate of Knowledge to become the Ministry of Knowledge. At the beginning of education in Saudi Arabia there was resistance to girls' education due to cultural and religion reasons. However, later King Faisal bin Abdul-Aziz (1906-1975) established the General Presidency for Girls' Education and to support this

decision, the government ensured that people were convinced that the aim of girls' education was to increase their Islamic knowledge (Prokop, 2003).

In the era of King Fahad bin Abdul-Aziz (1921-2005) he announced the integration of the General Presidency for Girls' Education under the Ministry of Knowledge however, this decision maintains gender separation. He also established a new ministry to focus on university level, and called it the Ministry of Higher Education. In 1970, the government issued education policies. In 2002, the Saudi government changed the name of the Ministry of Knowledge to the Ministry of Education. In 2015, the Saudi government integrated the Ministry of Education and the Ministry of Higher Education into a single Ministry of Education (MOE, 2015). In 1970, Saudi Arabia issued education policies which emanate from the Islamic religion and comprise the main guidelines for Saudi education; for example, belief in Allah, Islam as the religion, Mohammed as a prophet and the Arabic language as the language of education at all levels (Issa, 1979). However, under rules and regulations on the Ministry of Education official web page there are rules and regulations of private education, foreign education, university education, but there are no rules and regulations for scholarship or general education (MOE, 2017).

Ministry of Education in Saudi Arabia

The Ministry of Education in Saudi Arabia is responsible for education in the country. It is responsible for educational policy, manpower, opening new schools, providing materials, the provision of school buildings, designing the national curriculum for schools and preparing and supplying schools with textbooks. To achieve these responsibilities and to have good links between the Ministry of Education and schools in the country, the Ministry of Education established 17 branches called "General Administration of Education" in big cities and 28 "Education Departments" to cover the rest of the country. According to MOE (2013b) the Ministry of Education keeps many authorities such as national curriculum and textbooks

under its control and delegates some responsibilities and authority to the branches to work independently. For example, the Ministry of Education established policies on school canteens such as the health requirements for school canteen and delegated the implementation to the General Administrations of Education in the regions. In contrast, the General Administrations of Education in the regions delegate limited authority to headteachers, for example school canteen evaluation.

In Saudi Arabia, there are four basic educational levels. These levels are primary level, intermediate level, secondary level and university level. This study focuses on the primary schools (see Table: 1.3 below).

Table 1.3: School Levels in Saudi Arabian Education

No	Schools	The child's age on admission	Duration in years
1	Primary Schools	6 years old or 5 years and 10 months old	6
2	Intermediate Schools	Approximately 13 years old	3
3	Secondary Schools	Approximately 16 years old	3
4	University	Approximately 19 years old	4

The Ministry of Education started to open many public schools as well as Islamic schools in different regions. When the country's income stabilised, the private sector began to grow quickly. Therefore, private sectors were encouraged to invest in private education. Many new private schools were opened in different regions with government support. Therefore, the classification of schools also takes different forms: public schools, Islamic schools and private schools. For example, there are public primary schools, Islamic primary schools and private primary schools.

The Ministry of Education in Saudi Arabia established the General Administration of School Health. The General Administration of School Health has branches in all regions. Each branch

is called school health, they have medical staff such as doctors, dentists and nurses. The aim of school health is to provide health programmes and activities to promote students' health, physical, psychological and social health to schools in that region. However, in 2012, the Saudi government made a big decision, which was to move the General Administration of School Health and its branches from the Ministry of Education to the Ministry of Health (MOFA, 2012). This included staff and medical and nonmedical materials. The decision replaced the General Administration of School Health in the Ministry of Education with a new department called the Department of School Health Affairs. The decision included job descriptions for both ministries. The General Administration of School Health and its branches focus on five goals: first, health and physical education, fitness examination and health promotion; second, environmental sanitation and occupational health of school personnel; third, food awareness; fourth, providing first aid within the school; fifth, mental health and counselling. The Department of School Health Affairs under the Ministry of Education focuses on coordination with the authorities in the Ministry of Health and facilitates the implementation of school health activities in schools. The practicality of this decision started from the Ministry of Health by nominating nurses to work in schools. One nurse should implement a health service for no more than five schools. The nurses will work under the supervision of physicians from the Ministry of Health. It is good to have a nurse in school to implement a plan of maintaining students' body weight (Schroeder et al., 2016) but it is very difficult for one nurse to cover five schools due to the large number of students in each school with their differences in health needs. The Ministry of Education nominates a teacher in each school to help the nurse in implementing school health tasks. In reality, this decision did not come into full practice until recently, this was due to complexities such as the buildings of school health branches and the staff.

Primary schools in Saudi Arabia

As mentioned above, there are four levels of education in the Kingdom of Saudi Arabia, each with its own rules and regulations. The current study chose children aged from 11 to 12 years old because at this age, the schools control their meals and in 2010, children accounted for 28.8 % of the Saudi population, with the majority of them in primary schools. Moreover, much of the literature about children and obesity has been focused on those aged below 13 years of age. So, it is important to understand primary school rules and regulations in Saudi Arabia. The primary schools accept children aged six years old, with the youngest being five years and 10 months old. The primary school day is divided into six to seven lessons, each lasting 45 minutes, and there are five-minute breaks between each lesson. According to the MOE (1995b) primary schools in Saudi Arabia have many aims:

1. To inculcate the correct Islamic faith in students and take care of them through comprehensive Islamic education in their morals, ways of thinking, language and their sense of belonging to the nation of Islam.
2. To train students to pray and teach them good ethics and behaviour.
3. To develop different basic skills, specifically language proficiency, numerical skills and physical exercise.
4. To provide students with the necessary information on different topics.
5. To acquaint students with the mercy of God on their lives, on their geographical and social environment, so that they use this mercy in serving themselves and their community.
6. To enhance students' creativity and improve their manual work.
7. To develop students' understanding of their duties and rights and encourage love of their country and loyalty to their rulers.

8. To create students' desire to gain knowledge and practice and to educate them to get the most use from their free time.
9. To prepare students for the second stage of life.

Despite the fact that primary schools' aims in Saudi Arabia cover many aspects, such as how to practise Islamic faith and enhance students' creativity, the above aims only mentioned physical exercise and did not mention any other health aspects such as school health, health education and health promotion in schools.

Summary

From the above discussions, it can be seen that Saudi Arabia is located in a strategic place with a total population of a round 30 million and covers 200,000 square kilometres. The Saudi government has the power to make decisions within the country. The link between the different ministries in the Saudi government is stronger than with local governors and this system sometimes causes conflicts of interest between the ministries, which affects local governors. The Saudi Arabian educational system has developed since the government established it. It began simply as the Directorate of Knowledge in Riyadh and now comprises the Ministry of Education with 45 branches. The Ministry of Education is responsible for all things related to education in the country. It established the education levels, starting with primary and going up to university level.

The Ministry of Education in Saudi Arabia established the General Administration of School Health to provide schools with health programmes and activities to promote students' physical, psychological and social health. However, the government transferred the authority and supervision of this department to the Ministry of Health, this decision has not yet been put into practice because of its complexity; however, the government have announced that this will take place soon. Primary schools have six grades and the government has established

many aims, as mentioned above, it is clear that the aims did not include health, which makes it difficult for schools to deal with students' health issues. Schools in Saudi Arabia are classified in various ways including Islamic schools, public schools and private schools.

Study aim and research questions

Aims of the study

Obesity is a serious condition among children and many factors affect the body weight of Saudi children. So, it is important to explore these as there is very limited study in this area. The aim of this study is to explore each of the three types of school (public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia.

The objectives

- To explore the Ministry of Education policies and schools' environments to identify factors that can affect children's body weight.
- To explore teachers' perspectives in terms of any potential factors that could affect children's body weight.
- To explore the current understanding of healthy food, lifestyle and obesity among boys aged 11 to 12 in Saudi Arabia.

Structure of the thesis

This thesis is presented in nine chapters, the outline of the subchapters is as below.

Chapter Two: literature review

This chapter presents a literature review in order to provide an understanding of the topic and starts by clarifying the search strategies and inclusion and exclusion criteria. There is an overview of the World Health Organisation (WHO) and The Eastern Mediterranean Regional Office of the World Health Organisation, known as EMRO. This chapter also focuses on reviews of previous studies on children's body weight in the world and in the Eastern Mediterranean Health Region and specifically in Saudi Arabia such as Saudi Arabia's economy, schools, environment, gender and students' knowledge. The summary of the WHO recommendations regarding the factors which influence Saudi students' body weight are discussed in this chapter.

Chapter Three: Methodology

This chapter presents the research methodology and how I engaged with the Ministry of Education in Makkah and with headteachers, teachers and students to request their participation in the study. It also, highlights some difficulties that I faced and the way in which decisions were made. The chapter contains justification for the study, its aims and objectives, qualitative methods, the rationale for choosing a qualitative study, case study approach, quality of case studies, choice of case study organisation, study access, data collection methods, data analysis and ethical approval of the study from Cardiff University and the Ministry of Education in Makkah.

Chapter Four: An overview of cases

This chapter consists of an overview of cases. It starts with an introduction to the city of Makkah where the study was conducted. There follows an overview of the Makkah Ministry of Education. After that, each of the three school cases public, Islamic and private school is examined in detail. Each case includes the school's system, aims, statistics, an overview of

the school, school finances and school contact. This chapter concludes by examining the similarities and differences between the schools.

Chapter Five: Compares the findings related to the school system and philosophy

This chapter presents and compares the findings related to the school system and philosophy across the three case studies to draw out general conclusions. This chapter presents four sub themes. These are the teacher's role, the school canteen, the school programmes and the role of the Ministry of Education.

Chapter Six: Compares the findings related to the school physical environment

This chapter presents and compares the findings related to the school physical environment across the three case studies to draw out general conclusions. This chapter presents sub themes which is school canteen and facilities.

Chapter Seven: Compares the findings related to students' health behaviour

This chapter presents and compares the findings related to students' health behaviour across the three case studies to draw out general conclusions. This chapter presents five sub themes such as students' understanding of preferences, student society and community, media and food advertising, students' schools, and ways to change students' health behaviour.

Chapter Eight: Compares the findings related to outside factors that affect body weight

This chapter presents and compares the findings related to outside factors that affect body weight across the three case studies to draw out general conclusions. This chapter presents sub themes such as the media and families.

Chapter Nine: Discussion chapter

This chapter sets out the key findings of the study and the original contribution to knowledge. It presents the implication of the study for policy, practice and future research. It also includes an initiative to control student obesity and my future research plan.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This chapter presents a review of the literature relating to factors that affect body weight among children. It includes search strategies and inclusion and exclusion criteria. The aim of this chapter is to understand children's body weight nationally and globally. This chapter has two main parts. The first part shows the landscape of the topic globally through the World Health Organisation (WHO) and describes the role of its office in the Eastern Mediterranean. Following this, the chapter introduces body weight and some of the factors that affect it. This will be followed by a summary of WHO and EMRO recommendations and the cooperation of the WHO with Saudi Arabia. The second part of the chapter will discuss Saudi Arabian literature including Saudi Arabia's economy, schools, environment, students' gender and students' knowledge. Finally, this chapter will end with a conclusion.

Search strategies

Over the last few decades there has been a massive increase in the literature on body weight and it is difficult to cover all aspects related to this topic worldwide. Therefore, this study employed four methods of searching the literature to cover the overall context and problem of obesity in children globally and to explore the factors affecting body weight among children in Saudi Arabia.

The first method was a globally search using the WHO's website, this included the Eastern Mediterranean region's website, this branch produces the Eastern Mediterranean Health Journal (EMHJ). The search involved all the components of the website such as reports, programmes and articles related to the study.

The second method was a search using four databases for the research: CINAHL, MEDLINE via OVID, PsycINFO and the Applied Social Sciences Index and Abstracts (ASSIA).

The third method was using Saudi journals, these were: The Saudi Journal of Obesity, Saudi Medical Journal, Saudi Journal of Biological Sciences, Saudi Journal of Medicine and Medical Sciences, Saudi Journal for Health Sciences (Publication of Taif University), Saudi Journal of Medicine and Medical Sciences, the Annals of Saudi Medicine, the Saudi Journal of Sports Medicine, the International Journal of Health Sciences and the Saudi Journal of Gastroenterology. Databases were searched using the following terms, 'child*', 'paediatric' with 'obes*', 'body weight' with 'school*'. Next 'Saudi*' was entered and then the search was limited to studies with population samples aged between six and 12 years of age and with a full text.

The fourth method involved looking for expertise in the field through the websites of the individuals selected from Saudi expertise because I discovered that there are many unpublished Saudi papers.

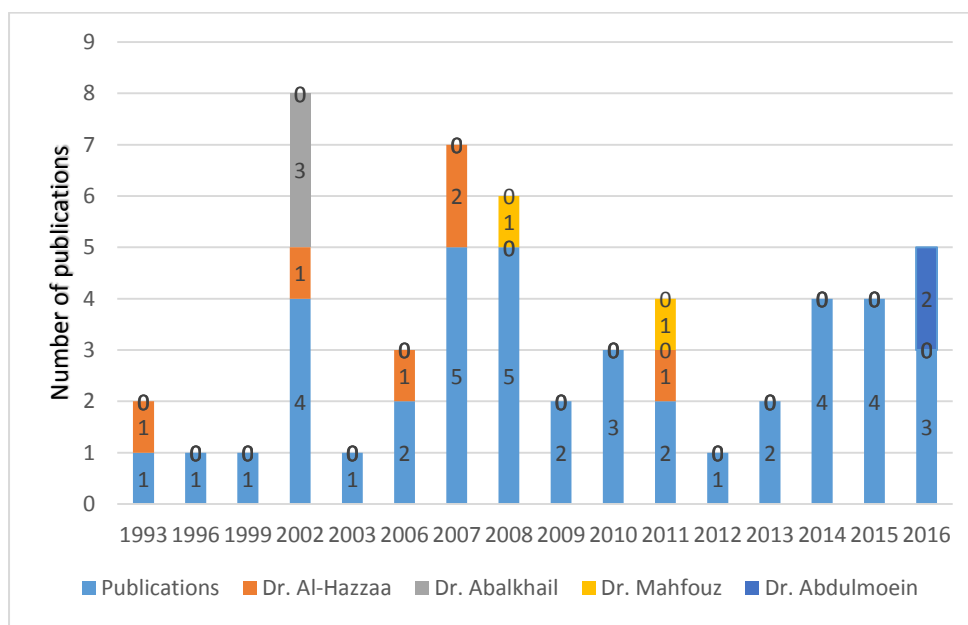
Inclusion and exclusion criteria

TABLE 2.1: Obesity Literature: inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
English and Arabic references	Adult obesity
Literature reviews	
Systematic reviews	
Reports	

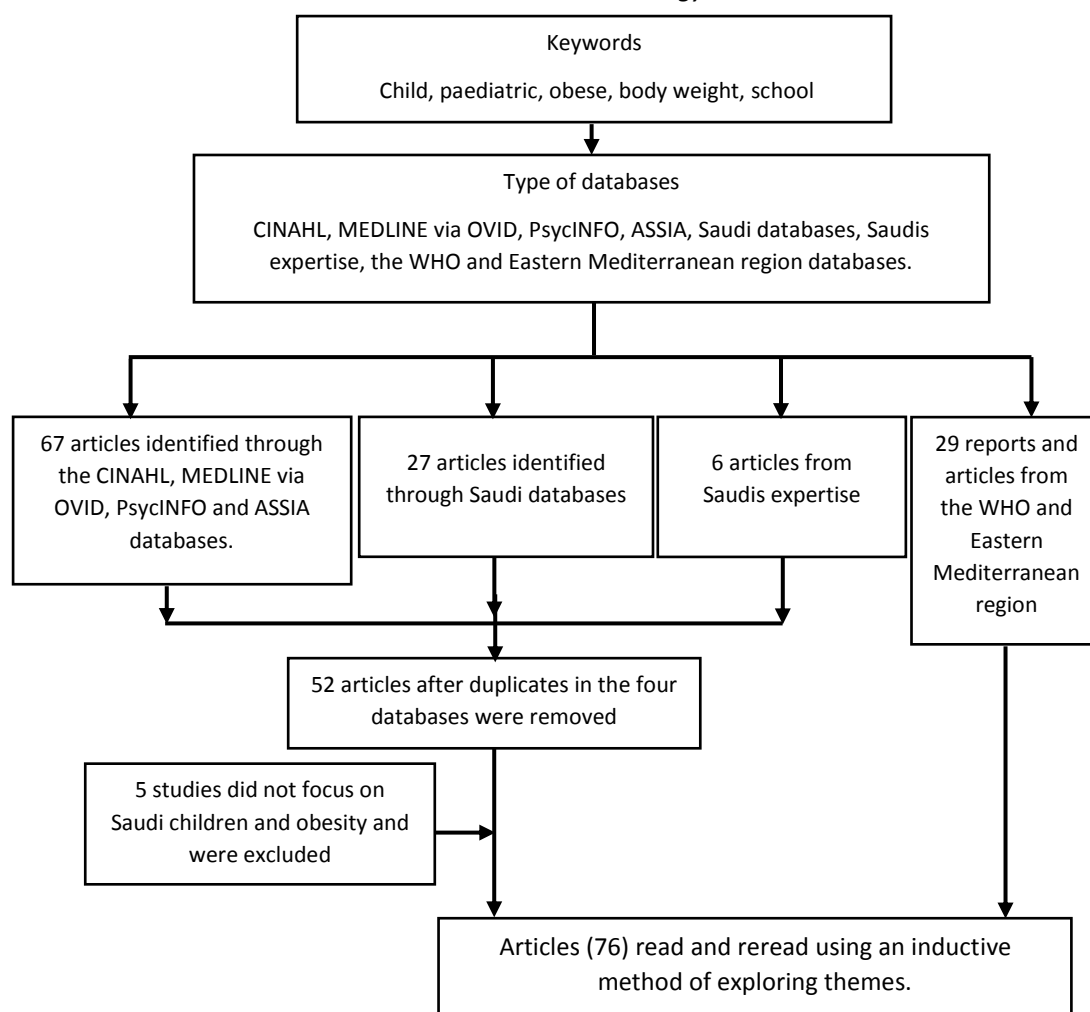
Searching in Saudi literature is very important to understand the current situation of factors that affect children's body weight among Saudis at school. I organised all the results from the Saudi literature according to the publication year, as shown below (CHART 2.1).

CHART 2.1: Saudi Literature



It appears that Dr Al-Hazaa has written six articles. Another search strategy was adopted, this was searching by the author's name as shown in the chart above. By searching on Dr Al-Hazaa's website, three new articles were found. This action aroused my curiosity, so I started looking at expertise references in the Saudi literature and as a result of that another six articles were added to the list. As a result of using all of the above search strategies, 129 national and international articles in total were selected, as shown in FIGURE 2.1.

FIGURE 2.1: Search strategy



Twenty-nine reports and publications globally and a hundred Saudi articles related to the topic were found. By removing duplicated Saudi articles, 52 articles remained. However, after reading these articles it was found that five studies from the Saudi literature did not focus on Saudi children and obesity and they were excluded. In addition, there were 29 reports and publications from the WHO. Therefore, 76 articles national and international were included in this study.

Using the search strategy mentioned above, it became clear that the World Health Organisation (WHO) plays a strong role in the world in terms of health in general and on children's health and their body weights in particular. Therefore, there are many important issues related to WHO's role and services to be mentioned.

World Health Organisation (WHO)

In 1948, the United Nations established the WHO in Switzerland to focus on international health. The WHO collaborates with 152 countries with regard to health issues. It has many health projects and strategies, for example the Global Strategy on Diet, Physical Activity and Health (WHO, 2004a). The WHO has also designed initiatives to improve people's health, such as healthy cities, healthy villages and healthy schools (Al-Khawashky, 2000). Moreover, it has a global forum; for example, the International Congress on Physical Activity and Public Health (ISPAH) is an international congress that is held every two years. The main goal of this forum is for experts from around the world to share their experience and knowledge.

The WHO also provides support for conducting research; for example developing the Global Physical Activity Questionnaire to measure physical activity (WHO, 2016a) and collaboration with many global organisations to help countries achieve their health goals (WHO, 2004a) for instance, working with the Executive Board of Health Ministers' Council for the Gulf Cooperation Council (GCC) (WHO, 2013a). The WHO has the power to develop and adapt many health recommendations because it has consultants from all over the world. For example, it has published the report of the Commission on Ending Childhood Obesity. This report includes many recommendations for tackling obesity among children and suggests that an effective way to achieve its goals will be by promoting the nutritional status and increasing physical activity (WHO, 2016a).

The WHO has six regional offices, the WHO European Region, WHO Region of the Americas, WHO African Region, WHO South-East Asia Region, WHO Western Pacific Region and WHO Eastern Mediterranean Region.

The Eastern Mediterranean Regional Office of the World Health Organisation (EMRO)

EMRO works with countries in the Eastern Mediterranean Region. It has 18 offices and the regional office is located in Egypt. EMRO uses three languages in its publications, Arabic, English and French. Countries in the Eastern Mediterranean Region are different in terms of their health status because it is driven by the socioeconomic development of each country (WHO, 2010c). Therefore, EMRO classifies the countries in a region into three clusters depending on the performance of the health system, health outcomes of the population and level of health expenditure (WHO, 2012b). The first category of countries is those whose socioeconomic and health development has improved, such as in Saudi Arabia (WHO, 2009). The second category includes middle-income countries who have basic public health but are struggling due to poor resources. The third category of countries comprises those that face difficulties improving their health status because their development faces many challenges, such as political instability (WHO, 2012b). This classification enable EMRO to understand each country's health challenges so that it can work with that country and each country has a profile on the WHO's website to provide a baseline for performance monitoring (WHO, 2012b).

EMRO has five strategic priorities, these are improving health systems, maternal and child health, non-communicable diseases, health security and communicable diseases and emergency response (WHO, 2012b). EMRO believes that many countries in the Eastern Mediterranean Region share similar traditions and cultural issues such as eating traditional foods that are rich in oils; therefore many of the WHO initiatives need to be adopted in order to make them suitable for implementation in the region. Therefore, EMRO is working to adopt many WHO programmes that are suitable for the region, such as a framework for

implementing the Global Strategy on Diet, Physical Activity and Health. This framework was developed following a consultative process (WHO, 2010a).

EMRO recognised that the countries in the Eastern Mediterranean Region need many leaders in public health in order to deal effectively with the national and international health issues; therefore EMRO in collaboration with Harvard University established a programme called Leadership for Health in 2015. The aim of this programme is to strengthen the skills and knowledge of the health leaders in the region. However, in Saudi Arabia there is no guarantee that those who attended this course will remain in the administration positions.

On 7 April every year the WHO celebrates World Health Day. Each year the WHO chooses a topic that is marked as the subject of the anniversary on this day. This is a great opportunity to educate people, take action and work together to improve people's health. EMRO celebrates these days too; however, occasionally it modifies the title so that it is appropriate to the region's needs. For example, the topic for World Health Day 2013 was hypertension, but EMRO added diet, nutrition and hypertension. What is worth noting with respect to World Health Days from 2001 to 2016 is that there were no World Health Days for obesity, physical activity, healthy eating and school health. However, changing the title from the one that EMRO uses can close this gap. For example, the World Health Day in 2016 focused on diabetes but EMRO changed the title to "Beat diabetes: Eat healthy. Be active". This action can be helpful to clarify the messages of the day; for example, schools in Saudi Arabia are celebrating the World Health Day and by making the title clear and attached to their community levels, this makes the messages more relevant to them.

One of the great areas of support for healthcare professionals in the Eastern Mediterranean Health Region is that EMRO has Research4life programmes, these include access to four databases (HINARI, AGORA, ARDI and OARE). This programme classifies developing countries in EMRO into two groups based on its criteria to provide countries with free or low-cost

access to the databases. Moreover, EMRO has EMHJ, which is a peer-reviewed journal established in 1995 to improve health in the region through supporting research. It is free and available in print and there is an electronic format in three languages Arabic, English and French. The impact factor is 0.663, as published in the 2016 Journal Citation Reports. Through searching in the EMHJ database it was found that there are many published articles which are relevant to the current study in the Middle East.

Body weight

Globally, the prevalence of obesity more than doubled between 1980 and 2014 (WHO, 2016a) and the increase in body weight was one of the top five leading risks associated with death (WHO, 2010c). The majority of studies in the Mediterranean Region conclude that children's body weight is increasing, and that it has reached an alarming level (Musaiger, 2004). One study shows that 35.9% of girls and 36.8% of boys aged 10-13 years of age in Kuwait are obese (Musaiger, 2004). According to a survey by EMRO in 1988, the percentage of overweight Saudi boys was 3%, whereas in 2005 it rose to 25% and this indicates significant changes within 17 years (Khatib, 2004).

Controlling obesity requires comprehensive cooperation between multidisciplinary teams and the community (WHO, 2014a). Wake and Reeves (2012) classified the environmental factors affecting obesity using three levels: macro, meso and micro. Macro refers to the large, regional, scale such as Hajj influences on health in Makkah. Meso refers to community influences, including primary schools and micro refers to children's families and peers. According to the WHO (2016c) the WHO established The Commission on Ending Childhood Obesity in 2014 to review the existing strategies and to build upon new recommendations in order to cover the current gaps. It stated that no single intervention leads to reducing obesity. It requires good cooperation and support for example between WHO, member states, government and non-government organisations, private sectors, philanthropic

foundations and academic institutions. This review states that tackling obesity requires an understanding of the environmental context during the life stages. It emphasised that government sectors have a strong impact on any obesity control plan. The Commission on Ending Childhood Obesity issued recommendations focusing on six areas, these include promoting intake of healthy foods, promoting physical activity, preconception and pregnancy care, early childhood diet and physical activity, health nutrition and physical activity for school age children and weight management. The Commission on Ending Childhood Obesity made many important recommendations to promote health in school environments and physical activities; these are as follows: establish guidelines for school meals to meet healthy nutrition standards, remove unhealthy foods from the school canteens, ensure that the school's curriculum includes subjects about nutrition, health education and physical education, increase parent and healthcare provider skills about nutrition, introduce cooking lessons for students, parents and healthcare providers, provide schools with suitable sports facilities and trained staff.

However, the majority of EMRO countries have no strategic plan to prevent and control obesity (Musaiger, 2004). Many of the studies on obesity carried out in the last ten years focused on the prevalence of obesity in the region and the majority of these studies concluded that childhood obesity is a serious challenge facing the Eastern Mediterranean Region (EMRO, 2015). However, comprehensive studies to determine the factors associated with obesity are limited (Musaiger, 2004). According to the WHO, the major risk factors leading to obesity are physical inactivity and unhealthy food. Therefore, the WHO has adopted the Global Strategy on Diet, Physical Activity and Health. To adapt this strategy to the Eastern Mediterranean Region, EMRO provides a tool for helping the countries of the region to make the necessary changes. EMRO has published a framework for the implementation of the Global Strategy on Diet, Physical Activity and Health in the Eastern Mediterranean Region (WHO, 2014d).

Factors affecting body weight

Global literature shows that obesity is a complex issue and that there are many factors contributing to overweight among children. In the Eastern Mediterranean Region, the actions and decisions of authorities have a significant effect on children's body weight. For example, there is no single organisation or programme that could increase activity levels. It needs the national government to work with health and non-health organisations to promote physical activities in the country (WHO, 2014c). There is a great deal of evidence in the literature which demonstrates that the country's role in the Eastern Mediterranean Region, including that relating to a country's economy, policies and education system, has a direct impact on people's lifestyles (Musaiger, 2004; Bagchi, 2008). A country's economy changes people's lifestyles. For example, the socioeconomic status in the Eastern Mediterranean Region can have an effect on physical activity because of the facilities that are available, such as using cars instead of walking a short distance and spending a long time sitting watching TV and playing games (Musaiger, 2004; WHO, 2011; WHO, 2016b).

Sometimes there are no policies in place within a country in relation to health issues and, if they do exist, they are not comprehensive or strong enough and this may be due to a lack of awareness among policy makers (WHO, 2015b). For example, a country may not have strong control policies for the advertising of unhealthy food for children (WHO, 2010c; WHO, 2015b). However, there are other factors affecting people's lifestyles and health, including physical inactivity, dietary habits and the environment. The Foresight Obesity System Map mentioned five causes of obesity on the basis of the available evidence and this shows similarity with the current evidence from Saudi Arabian literature. The actions and decisions of authorities such as the Ministry of Education in Saudi Arabia can have an impact on the school environment, which can lead to students becoming obese. For example, schools have limited physical education programmes, and the countries in the Eastern Mediterranean

Region have a direct role to play in the school system and are responsible for developing school curricula. Countries need to pay more attention to creating a positive school curriculum for teaching physical activity and healthy diets (WHO, 2004b).

Globally, physical inactivity is one of the serious risk factors for early death and is estimated to be the cause of around 30% of ischaemic heart disease and 27% of diabetes (WHO, 2014c). The rate of physical inactivity among people in the Eastern Mediterranean Region is very high compared to that in other regions (WHO, 2014b). Therefore, the WHO recommends that children have at least 60 minutes of physical activity daily (WHO, 2014b). A global school-based student health survey shows that at least 80% of children in the large majority of countries do not undertake regular physical activity (Lobstein, 2013). The literature shows an increase in the prevalence of physical inactivity among the population in the Eastern Mediterranean Region from 30% to 70% (WHO, 2016a). There are many factors leading to physical inactivity, for example a lack of accessibility to sport facilities (WHO, 2015b; WHO, 2014b), lack of support and encouragement (Lobstein, 2013), life becoming more sedentary (WHO, 2014b; Musaiger, 2004) and inadequate commitment by different government sectors (WHO, 2014c). According to WHO (2014c) there are many challenges facing national action on physical activity in the Eastern Mediterranean Region: these are leadership, national policy, funding, supportive environments, cultural norms, knowledge, integration of physical activity into health programmes, physical education, physical activity behaviour and a high turnover of leadership. The majority of these challenges are related to the countries' roles.

Dietary habits in the Eastern Mediterranean Region have changed significantly over the last few decades (Lobstein, 2013). Many factors influence diet, for example, income, food prices, personal beliefs and culture can all shape people's dietary habits (WHO, 2015a). The diets of many people in countries within the Eastern Mediterranean Region contain large quantities

of saturated fat and sugar. It is estimated that the daily fat intake of people in the Eastern Mediterranean Region increased from 45g to 65g daily between 1969 and 2004 (WHO, 2012a) and a high degree of fast food is reported to be associated with obesity among children in some countries in the Eastern Mediterranean Region (Musaiger, 2004). In the UAE 32% of children aged six to seven years of age miss their breakfast completely, and this increases to 50% of Bahrain children and 74% of Saudi Arabian children (Lobstein, 2013). One of the major issues in the Eastern Mediterranean Region is a fast shift from traditional diets to fast food and a slow shift in government priorities to solve health problems (Lobstein, 2013). Many countries in the Eastern Mediterranean Region have nutrition policies but some of the countries do not have a clear implementation strategy (WHO, 2011; WHO, 2010a). Therefore, EMRO has developed a regional strategy on nutrition for 2010-2019 to address the health and nutritional issues in the region (WHO, 2011). This strategy divides the Eastern Mediterranean Region into four groups. The first group includes countries at an advanced nutrition transition level and which have a high level of obesity, such as Saudi Arabia. The second group includes countries at the early nutrition transition level and which are classified as having moderate levels of obesity. The third group includes countries at an undernutrition level and which have a high level of malnutrition. The fourth group involves countries in complex emergencies such as Afghanistan.

Environment factors, such as places, facilities and weather, can affect physical activity (WHO, 2010b). The physical environment plays a significant role for children because the environment can affect them in terms of their choices of food and their activities (WHO, 2014a). According to WHO (2014a) many environmental factors are linked to urbanisation, such as unsafe outdoor facilities, unsuitable weather and a lack of sports facilities. Countries play a huge role with regard to creating a suitable and attractive sports environment in public places and schools (Musaiger, 2004). They should consider building sports areas and provide these with good sports facilities. They can also add some extra physical activities to the

school curricula (WHO, 2004b) and implement environmental policies for the public (WHO, 2010b).

To understand the factors affecting body weight The Obesity System Map, presented by the UK Foresight Obesity System Map, is currently the most comprehensive framework outlining the causes of obesity and its complexity (Butland et al., 2007).

Summary of the WHO and EMRO recommendations

The global literature review shows that no programme or single effort can have a significant impact on controlling normal body weight among children. Therefore, any health programme needs to have three important aspects. The first aspect means the programme should be supported by the country. Secondly, the programme should have a comprehensive plan. Thirdly, the programme should have a strategic plan to collaborate with many involved sectors. For example, in Finland the level of physical activity is one of the highest levels in the world because the country has established a committee from all government sectors whose members have worked together for over a decade to reach this remarkable level of physical activity (WHO, 2014c).

Many recommendations from the WHO and EMRO highlight the importance of the support of the country for any initiatives developed for the community. For example, the WHO in one publication issues a set of recommendations on the marketing of foods and non-alcoholic beverages for children and it outlines 12 recommendations, the majority of which focus on the country's role (WHO, 2010c). As another example, EMRO recommends seven top investment areas which are aimed to encourage physical activity and make a significant contribution to promoting people's health. The country can play a strong role in four of them: schools, transportation, health care and the design of cities (WHO, 2014c). The remainder

can be achieved by any health organisation, for example sport for all, community programmes and public education.

The WHO recommends setting up a comprehensive obesity programme. For example, an obesity programme should include healthy dietary advice, physical activity, education and training programmes, new policies and community involvement (Musaiger, 2004). It is recommended that policy options in schools are adopted to cover school recognition, curriculum, food and physical environment, staff's health awareness and health services of school (WHO, 2004b). One of EMRO's recommendations for the seven top investment areas is to encourage physical activity in schools and to ensure this programme is comprehensive. The school programme should include a school's curriculum, educational programmes, environment and facilities, and state how it encourages people to walk to school (WHO, 2014c). The WHO recommends steps for applying diet, physical activity and health, this starts with understanding the risk factors, then reviewing and updating policies and finally identifying the best way to apply these policies (WHO, 2010a).

The third important aspect is working with other bodies, such as country sectors or any other government or private organisations, in order to have a positive impact on the programme's success. For example, the efforts of many stakeholders, both private and public, can together help to change people's dietary habits and levels of physical activity (WHO, 2004a). The recommendation is to work with health sectors to establish counselling in physical activity programmes (WHO, 2010b). In order to devise a successful policy and plan for implementing diet, physical activity and health the WHO recommends increasing stakeholders support, cooperation with other relevant sectors and considered cultural issues (WHO, 2010a).

Although the above recommendations were based on scientific evidence and it were published by a respected health organisation, it is not easy to implement it in Saudi Arabia for many reasons. The first one is the long process to approve any national issues from the

high authorities in the government. Secondly, there is a diversity of health providers in Saudi Arabia, such as public sector, private, military and the Ministry of Defence. Thirdly, the cost of the project will affect the budget of the Ministry. Therefore, any project that is not supported by financial provision and advice from the government will not succeed.

WHO and Saudi Arabia

There are many health services providers in Saudi Arabia. The Ministry of Health is the main provider, the Ministry of Defence and Aviation is the second most important health provider and then there are the Ministry of Interior, private sectors and the Ministry of Education (WHO, 2013a). The health delivery model in Saudi Arabia is classified into five levels: primary health care centres, district hospitals, general hospitals, central hospitals and medical cities (WHO, 2013a). EMRO has good cooperation with Saudi Arabia, for example with the Country Cooperation Strategy. It is a project that is being run for up to five years and involves an agreement about priorities between the WHO and Saudi government so that they work collaboratively to achieve specific goals.

According to WHO (2013a) Saudi Arabia has three collaboration projects, these are health, infection prevention and the control and prevention of blindness. These projects operate in three collaboration centres: King Faisal Specialist Hospital and Research Centre, King Khaled Eye Specialist Hospital and King Abdulaziz Medical City. Although EMRO has produced posters and pamphlets to promote health behaviour in its countries, some health education and promotion publications issued by EMRO have not considered Saudi Arabia's social and cultural issues. For example, a publication under the title of "I Live a Healthy Life" focuses on children and their education. This publication has received a great deal of criticism, as it conveys a weak message to Saudi Arabian children. Firstly, it uses rare animals in the Saudi environment, such as skunks. Secondly, the pamphlet refers to schools with mixed genders whereas Saudi does not have mixed schools. Thirdly, it uses uncommon children's play tools,

which are not available in the majority of Saudi houses. Fourthly, the pamphlet depicts a cigar, but cigars are not common in the Saudi culture. These issues may confuse children's understanding or may not attract their attention (WHO, 2013b).

Saudi Arabian Literature

This second part of the chapter reviews the Saudi literature. The search strategy for the Saudi Arabian literature used databases: CINAHL, MEDLINE via OVID, PsycINFO and the Applied Social Sciences Index and Abstracts (ASSIA) and many Saudi journals. The search used the terms 'child*', 'paediatric' with 'obes*', 'body weight' with 'school*'. Next 'Saudi*' was entered and then the search was limited to studies with population samples aged between 6 and 12 years of age and with a full text. The search also included some Saudi experts in the field through their websites. The results produced 47 studies that focused on obesity among children in Saudi Arabia, as shown in Table 2.2 below. Many important themes appear in Saudi Arabian literature, these include Saudi Arabia's economy, schools, environment, students' gender and students' knowledge.

TABLE 2.2: Saudi Literature

	Studies	Year	Data of data	Age	Target	Region	Sample size			The way to measure BMI	Overweight %		Obese %	
							Total	M	F		M	F	M	F
01	Al-Nuaim et al.	1996		06-18	Public Schools	Different province	9061	9061		CDC	11.7		15.8	
02	Al-Shammari S.A	2001		6-17	PHCC	Riyadh	1848	940	908	WHO	9.1	11.9	7.7	9.7
03	Abalkhail, B et al.	2002	2000	9-21	Public Schools	Jeddah	2860	1403	1457	WHO	13.4		13.5	
04	El-Hazmi & Warsy	2002	1994-98	1-18	household	Different province	12701	6281	6420	Cole's Refer	10.7	12.7	6	6.7
05	Al Maie S	2005		8-12	schools	Alkhobar	1072	-	1072	WHO	-	-	-	14.9
06	Al-Saeed, W. Y. et al.	2006	2003	6-17	Public and private Schools	Al-khobar	2239	-	2239	Cole's Refer, CDC		20		11
07	Farghaly N et al.	2007	2000	7-20	Schools	Abha	767	327	440	WHO	3.3	8	7	9
08	El-Habib M	2008		6-15	schools	Asser province	1884	High altitudes= 429 Low altitudes = 446	=483 =526	WHO	8.9 4.9	16.8 8.2	-	-
09	Amin et al.	2008		10-14	Public schools	Riyadh	1139	1139	-	Cole's Refer	14.2	-	9.7	-
10	Al-Dossary	2009	2006	2-18	Private schools private clinic	Eastern province	7056	3933	3123	CDC	18	20.3	26.4	19.3
11	El Mouzan et al.	2010	2005	5-18	Houses	National	19317	9808	9509	WHO/CDC	22.4	23.8	10.1	8.4
12	Collison K et al.	2010	2007	10-19	Schools	Riyadh province	9433	5033	4400	CDC	15.5		21.1	
13	Mahfouz et al.	2011	2008	11-19	Private schools private clinic	Southwestern Saudi	1869	1249	620	WHO	11.5	15.5	12	14
14	El Mouzan	2012	2004-05	2-17	Houses	Central South west north	11112	1793	1732	CDC	21.3	20.7	10.3	8.3
								1715	1698		12.9	13.8	6.3	5.7
								2117	2057		18.5	21.8	9.2	9
15	Al Alwan I et al.	2013	2006	6-16	Private schools private clinic	Riyadh	1212	512	700	WHO	21.5	21.3	17.4	9.3
16	Al Enazy et al.	2014	2011-12	6-13	Private schools	Tabuk	331	178	153	WHO	7.3	12.4	17	20.9
17	Al-Hassein	2014		6-17	Public schools	National Guard Riyadh	2149	1138	1011	CDC	12.1	15.7	14.2	15.5
18	Alhaimeed et al.	2015	2012	6-10	Public schools	Al Qassim	874	618	256	WHO	9.5	19.1	7.8	15.2

It is worth mentioning that there is much debate in the literature with different views expressed on the methods used for measuring Body mass Index (BMI). BMI is the weight in kilograms divided by the square of the height in metres. For interpreting the results of BMI in adults, a score equal to 25 or higher is classified as overweight and a result equal to 30 or higher is classified as obesity, whereas interpreting the results of BMI in children is different. This is because children's BMI changes fast as they grow, and there is also a difference between BMI in boys and girls. Many countries have used the WHO standards to measure BMI among children (WHO, 2006). However, some countries have their own standard. For example in the UK the British 1990 growth standard (UK90) is recommended for assessing BMI in children aged four years and above (Wright et al., 2002). Therefore, there are many standards available and researchers have to decide which one should be used to classify BMI among children. The common standards are the WHO standard (WHO, 2006), Cole's standard (Cole et al., 2000) and the Centres for Disease Control and Prevention (CDC) (Grummer-Strawn et al., 2010). Some studies use two standards to compare results with other countries (El Mouzan et al., 2010). As shown in Table 2.2, nine studies used the WHO growth standard. Five studies used the Centres for Disease Control and Prevention (CDC) standard, two studies used Cole's standard and two studies used two other methods. It is important to know this debate, however what is more important is how to interpret the results using the standards mentioned above.

The study by El Mouzan et al. (2010) assessed the prevalence of obesity among Saudi children and compared the WHO and CDC standards in 19,317 participants aged from 5 to 18 years old from different regions in Saudi Arabia. This study stated that the CDC standard underestimates the prevalence of body weight among Saudi children. For example, the results of the study sample using the WHO standard showed 23.9% overweight and 9.5% obese. Whereas using the CDC standard in the same sample the result was 20.4% overweight and 5.7% obese.

In 2013 the Ministry of Health in Saudi Arabia decided to use a Saudi reference adapted by El Mouzan et al. (2007) as a national referential standard for the physical growth measurements of Saudi children and adolescents (MOH, 2013). However, the majority of the Saudi studies used the standards without mentioning reasons for choosing certain types of BMI references, few studies support their choice by mentioning reasons. For example, the studies which used the WHO reference gave many reasons such as that the WHO reference was recommended, it is widespread and used with different ethnicities and cultural settings (Al-Shammari et al., 2001; Khalid, 2008; Al-Enazy et al., 2014). Al-Saeed et al. (2007) study used Cole's reference and because it has limitations the study also used the CDC reference to include underweight in its results.

During the International Obesity Task Force (IOTF) meeting, the scientists tried to establish an acceptable international measurement of obesity and overweight in children. In 2000 international data were published. Since then the debates have continued regarding whether the measurement reference should be applicable to all countries or not. This debate will continue for some time and further discussion on this point would go beyond the aim of this study.

Although, the Saudi reference was established in 2013 by the Ministry of Health, it was not used in the research as seen in Table 2.2. However, from the table above it is obvious that the majority of the articles take a long time to be published and this may be one of the reasons why there is no evidence of the Saudi reference being used in Saudi publications to interpret the results of BMI. The majority of the studies from (Table 2.2) were aimed at determining the prevalence of overweight among Saudi children. It has been found that the prevalence of overweight among Saudi children has been increasing consistently for the past twenty years. For example (Table 2.3) shows that body weight has increased among Saudi boys in Riyadh.

TABLE 2.3: OVERWEIGHT AND OBESE BOYS IN RIYADH 2001-2013

	2001	2008	2013
Overweight	9.1%	14.2%	21.5%
Obess	7.7%	9.7%	17.4%

The national study by El-Hazmi and Warsy (2002b) determined the prevalence of overweight among 12701 participants aged 1-18 years old in Saudi Arabia. This study measured the participants' height and weight and calculated their BMI. The results showed that the prevalence of overweight was 10.7% and obesity among boys was 6%, whereas the prevalence of overweight and obesity among girls was 12.7% and 6.7% respectively.

A cross-sectional study conducted by El Mouzan et al. (2012) sampled 11,112 participants aged 2-17 years old from various regions of Saudi Arabia. This study measured the participants' height and weight and calculated their BMI. The results showed that the prevalence of overweight is increasing in all regions of Saudi Arabia. Moreover, the percentage of overweight and obesity is almost double that in the study by El-Hazmi and Warsy (2002b). This study will use the term overweight instead of overweight and obesity because both of them indicate that the children have more body fats than the healthy level.

From the review of the Saudi literature, it is obvious that the majority of the studies used questionnaires to collect information such as sociodemographic data, food habits and physical movement and to measure students' BMI, but very few studies used interviews and no study used observation as a research methodology to explore the factors affecting body weight in Saudi schools. Moreover there is a knowledge gap, in that no study has been conducted within Islamic schools in Saudi Arabia and the above papers do not consider factors that contribute towards overweight children in Saudi Arabia, in particular the school environment. However, this study is focusing on schools for additional reasons. This is the first study within the Islamic school context in Saudi Arabia and it is the first study to explore

the factors that could affect body weight among boys within the three types of school in Saudi Arabia (public, Islamic and private schools). It aims to understand schools' rules and regulations in regard to students' health; to observe school facilities and environments because schools have different infrastructures; to understand school authority because some schools have other authorities besides the Ministry of Education, such as private school. Furthermore, Saudi children spend an average of eight hours daily in school and this study is important to explore the current situation regarding the factors affecting their body weight within the three different types of school. The important point is that, controlling obesity among children requires determined efforts and collaboration from schools as well as families and other government sectors. This study will identify some of the issues that children are facing in their daily environment regarding body weight issues, schools' policies and environment that contribute to weight gain. The study will explore new ideas, thoughts and the barriers to controlling body weight, which, in turn, may produce many recommendations to prevent children from becoming overweight in the future.

In order to gain a greater insight into the possible factors that could contribute to obesity among Saudi children, I decided to review all the Saudi articles in the literature again in order to search for key themes that may highlight reasons why obesity is prevalent in school children. By reading the Saudi literature in depth and searching for factors that contribute to overweight among Saudi children, a great deal of information was acquired. I read the Saudi literature a second time and I began searching for factors that affect students' body weight and made some notes. The notes were read again in order to make a list of factors in each article. Then I started to produce major factors in each article. The information was organised into groups and each group was reviewed to ensure that information fitted into the particular group. Following this a search of Saudi literature was undertaken in order to identify major themes and list them. By the end of this phase, I had a list of major themes. The next phase was to review themes by reading the original text as I found that some themes can be

combined with others. Finally, the Saudi literature shows that about five major factors contribute to overweight among Saudi children. These factors include the Saudi economy, schools and their collaboration with families, the Ministry of Education and the Ministry of Health. The third factor is the environment. The fourth factor is gender and the last factor is students' knowledge.

Saudi Arabia's economy

The majority of the Saudi literature comment on the strong effect of the economy on all aspects of Saudi life after the Saudi oil boom, for example, the patterns of Saudi life and food patterns among the Saudi population.

Before the Saudi oil boom (1970-1980), the majority of Saudi's worked in simple occupations such as fishing, raising livestock and serving pilgrims going to the two holy Mosques (Mahdi, 2000). However, the rapid development of the Saudi economy led to many job opportunities, so Saudi's shifted to working in industry and the government sector and this change still affects the daily lifestyle of many Saudis. For example, some of the Saudi literature mentions that the prevalence of obesity among Saudi children is high in families with working parents, specifically mothers who work (Abalkhail et al., 2002; Al-Saeed et al., 2007; Amin et al., 2008; Al-Enazy et al., 2014). This may be due to increased buying of food from restaurants; in Saudi Arabia, local fast food restaurants have contributed to an increase in the consumption of fast foods by offering home delivery services (Musaiger et al., 2014). In addition, the majority of the food in these restaurants is high in calories and fats with limited options for healthy food (Al-Muhaimeed et al., 2015).

Following the Saudi oil boom, the Saudi literature shows that Saudi families' incomes increased. This change has been reported as a factor affecting children's body weight. For example, a study by Abalkhail (2002) stated that every Saudi family owns at least one car and

this has led to increased reliance on cars for transportation in Saudi daily life (Al-Hazzaa, 2007a). Saudi families' increased incomes have led to the families buying other items; for example, inside the Saudi home these days electronic devices are everywhere and these lead to sedentary behaviour (Al-Agha et al., 2016). According to Al-Hazzaa et al. (2011), 60% of the Saudi Children is not active. The rapid development in Saudi Arabia over the last three decades has not only brought significant changes in the lifestyles of Saudi adults but also in their children's lifestyles. A sedentary lifestyle is common, particularly among Saudi children. The Saudi economy has affected all aspects of Saudi life and resulted in the Saudis having increasingly sedentary lifestyles, particularly Saudi children. For example, Mahfouz et al. (2008) used a structured questionnaire in a study to assess physical activities and related behaviours. They report that 38% out of 2,696 Saudi boys aged from 11 to 19 years old spent more than three hours daily in front of the TV screen. A study by Al-Dossary et al. (2010b) noted that Saudi children have become less active, spending more time watching TV and using computers, playing computer games and other electronic devices, on average for six hours daily. Al-Hazzaa (2007a) stated that among 296 Saudi boys aged from 8 to 12 years old, 47.1% engaged in only half an hour of moderate-intensity physical activity for three continuous weekdays. This study concluded that there was a high prevalence of physical inactivity in Saudi boys. The increase in Saudis' incomes during the past four decades Amin et al. (2008) works as a factor enabling children to eat outside the home, consequently the nature of food consumption in Saudi Arabia has changed. For example, Saudi children can easily buy food from outside the home and the food available is high-energy food (Al-Hazzaa et al., 2011). Moreover, the low price of fast food has resulted in Saudi children increasing their food consumption (Amin et al., 2008).

Schools

A number of examples from the Saudi literature highlight the increase in overweight children of school age in Saudi Arabia (Al-Muhaimeed et al., 2015; Abalkhail, 2002; Al-Hazzaa, 2007b). Children spend an average of eight hours daily in school and this makes schools an important factor with regard to obesity control (Abolfotouh, 2013). The schools can have a negative impact on children's body weight due to inadequate physical exercise programmes (Al-Shammari et al., 2001) and although the school has facilities of physical activity not all schools take into account the hot weather in Saudi Arabia (Al-Khaldi et al., 2014). A cross-sectional study Al Alwan et al. (2013) among children aged 6-16 years old found that among 729 students in public schools in Riyadh, 19.6% were overweight, whereas 24% were overweight among 483 students from private schools in Riyadh. Therefore, the study by Al-Rukban (2003) recommended that the current level of school' activities should be increased in order to improve students' health.

Recently, an editorial in the Saudi journal Obesity entitled "Should schools be responsible for childhood obesity prevention?" stated that schools play a significant role in educating students about their diet. This role can involve encouraging students to take responsibility for their health. The conclusion of this article promotes encouraging schools to take responsibility for nutritional education, physical education and more intervention in student's health, and also advocates that schools should keep students active by using the available facilities (Abolfotouh, 2013). Therefore, one of the objectives of this study is to explore the environment in schools to identify factors that can affect children's body weight, because the Saudi literature states that schools could be an ideal target for obesity control (Al-Muhaimeed et al., 2015) and can play a strong role in keeping children active (Abolfotouh, 2013). In fact, it is not easy to control obesity among the Saudi Arabian population because it is a complex health issue and it needs strong efforts and collaboration from individuals as

well as from various government sectors. Therefore, many articles call for schools to engage in coordinated efforts on different levels including students' families, communities and government sectors (Abalkhail et al., 2002; Al-Hazaa, 2006; Al-Saeed et al., 2007; Alam, 2008).

Schools' collaboration with Ministry of Education

The Saudi literature was focused on two major points: school education on physical activities and nutrition, and the school curriculum. The Saudi Arabian government controls education financially and through planning, for example by designing and building schools, recruiting school staff, and planning the school curriculum and the method of student evaluations. Schools have no authority to change school education and the school curriculum. Therefore, the literature include many recommendations to the Ministry of Education, it suggested including some subjects about obesity control, the importance of healthy food and physical activities in the school curriculum.

School education includes physical and nutrition education programmes recommended to take place in the early stage of the Saudi national obesity control programme (Al-Rukban, 2003). Al-Khaldi et al. (2014) stated that there is evidence demonstrating that school-based intervention helps to prevent students becoming overweight. Therefore, they recommended that schools should have at least the basic sports resources available and should increase the time available for sport lessons in school to three hours per week instead of one hour, because the Saudi curriculum still states that only one lesson a week for physical exercise is compulsory in all schools. The study by Al-Dossary et al. (2010b) supported the need to increase the number of physical education sessions in schools for Saudi students. Another study requested that a daily physical education programme be implemented (Al-Hazaa, 2004). On the other hand, it is important also to review schools' nutrition education programmes (Abalkhail, 2002), because it is vital to increase Saudi students' awareness of

healthy food (Abalkhail et al., 2002) and schools should have health education programmes that can change students' health behaviours to achieve better status (Al Dhaifallah et al., 2015). Moreover, most of the literature calls for programmes to control obesity among schoolchildren, for example, by developing national school prevention programmes (Farghaly et al., 2007) and conducting health education programmes (Taha, 2008).

Abalkhail (2002) emphasises the importance of reviewing the existing curriculum of nutritional education programmes among Saudi schools. Al-Dossary et al. (2010b) emphasised that changing the school curriculum is a priority this could include incorporating health messages. Al-Muhaimeed et al. (2015) stated that schools should have comprehensive obesity control programmes which involve the school curriculum, school environment and school food. Al-Khaldi et al. (2014) recommended that the school curriculum should include the importance of physical activities and a healthy diet as well as subjects such as obesity prevention and control. Moreover, the school curriculum should include health nutrition programmes aimed at controlling body weight specifically (Abalkhail, 2002). These programmes should have a positive effect on students; this can be achieved through competitions between students, with various prizes on offer, and teachers should engage interactively with students (Taha, 2008).

Schools' collaboration with families and communities

Schools should promote more collaboration with families and the community to establish programmes to increase Saudi students' health awareness (Abalkhail et al., 2002) and they should work together on strategies to prevent students from becoming obese (Al-Hazaa, 2006). Collaboration between schools and families is one of the most effective strategies for improving students' health (Al Dhaifallah et al., 2015). Moreover, they should make long-term commitments in order to succeed in this strategy (Al-Saeed et al., 2007). This level of intervention between schools and communities can lead to changes in the social and cultural

context to prevent students from becoming obese (Alam, 2008), community participation involves understanding the whole problem and sharing the planning and evaluation (Al Dhaifallah et al., 2015). For example, schools should have good facilities for physical activities as well as in community venues (Mahfouz et al., 2011).

Two of the main articles, which have been published, focus on controlling obesity in Saudi Arabia. Al-Khaldi et al. (2014) was the first article to be published, it focused on an integrated national obesity control programme in Saudi Arabia. This article identifies priorities for the obesity control strategy as the first steps in developing a national programme. This strategy identifies the responsibilities of individuals, families, the community, organisations and government sectors in Saudi Arabia to prevent obesity. Al-Khaldi and his colleagues focused on the role of family and community, they stated that Saudi culture encourages family members to eat together. Therefore, they made many recommendations for food preparation and changing food habits. For example, prepare meals from different food groups, use olive oil in cooking, encourage drinking water, skimmed milk and fresh juices, do not watch television while eating, use separate plates rather than eating from a large plate and eat slowly and chew the food thoroughly.

Al Dhaifallah et al. (2015) published an article about childhood obesity in Saudi Arabia, including the opportunities and challenges. This article suggests a strategy for addressing the obesity problem in Saudi Arabia. It covers a general health promotion approach, health promotion in the Saudi Arabian context and the roles of the different players in health promotion, such as schools, parents and the community.

Schools' collaboration with Ministry of Health

Schools and health professionals should share responsibility for taking steps to achieve positive health outcomes for Saudi students (Al Shehri et al., 2013). For example, health professionals and schools can implement health education and promote healthy habits

among students in the early stages (Al-Hussein et al., 2014). Furthermore, the schools should collaborate with the Ministry of Health to control obesity among children (Al-Hussein et al., 2014). Moreover, the health authorities should play a strong role in supporting schools to halt the increasing incidence of overweight among students (El Mouzan et al., 2010). For example, by conducting health education sessions about controlling a healthy body weight for students (Al-Khaldi et al., 2014).

Some studies focused on the health sector and the role of health professionals in controlling obesity. The study by El Mouzan et al. (2010) stressed that the health sector in Saudi Arabia has a duty and responsibility to control obesity among children. Another study Farghaly et al. (2007) recommended that the health authorities should put their efforts into evaluating children's food in the markets. A well-qualified health professional can play a strong role in controlling obesity (Al-Saleh and Al-Zahrani, 2015). The role of health professionals in obesity intervention programmes is to promote physical activities (Al-Hazaa, 2004). This starts with a routine assessment and good counselling on fitness (Al-Hazaa, 2002). Health professionals should carry out surveillance of the Saudi population's growth indices to identify obesity and start early intervention as soon as possible (Abalkhail and Shawky, 2002), treating the cases by involving the families and making changes in a stepwise manner (Al-Rukban, 2003). Two studies call on health professionals to do more research in order to understand the nature of growth-related factors in the Saudi community (Al-Rowaily et al., 2007) and to explore the influence of other factors on the prevalence of obesity (Al Alwan et al., 2013).

The Arab Taskforce for Obesity and Physical Activity proposed a Strategy to Combat Obesity and Promote Physical Activity in Arab Countries during the third Arab Conference on Obesity and Physical Activity (Musaiger et al., 2011). This strategy included general guidelines to combat obesity and the fourteen Arab countries were asked to choose how to implement this strategy. The strategy nominated the Ministry of Health in each country to take

responsibility for implementing it. The target areas in this strategy are pre-school, schools, primary health care, hospitals, food companies, food service, media, public organisations and the workplace.

Schools were the second target area of the Strategy to Combat Obesity and Promote Physical Activity in Arab Countries. This strategy focused on primary and secondary schools in the government sectors and private sectors. This strategy included expected outcomes, objectives, indicators and action plans.

The expected results of this strategy are promoting physical activity and healthy diets among students through a good school education and a suitable environment. It also includes promoting physical activity and healthy diets among students, families and the community using school facilities and encouraging people to participate in many physical activities and healthy food regimes.

The strategy has many objectives including reaching 25% of students who eat home breakfasts daily; reaching 25% of students who participate in physical activity for one hour daily and reaching 25% of teachers who are well educated in healthy aspects. It also involves reducing sedentary behaviours among students; reaching 25% of students who eat fruit more than four times daily. It further aims to reduce by up to 20% the number of students who drink soft drinks more than three times a week; reducing up to 30% the number of students who eat fast food more than three times a week and achieving a 50% awareness among the parents of students regarding the benefits of exercise and healthy food.

The important issue in this strategy was the focus on action plans; for example a school health plan should be established to cover and integrate the elements of healthy food and physical activities. School curricula should include knowledge and skills on healthy body weight; there should be more control over food provided at schools and there is a need to educate teachers on how to promote a healthy life for students. Developing guidelines for

healthy nutrition and physical activity and practical guidelines for teachers is essential, along with conducting research and increasing the number of awareness programmes for students. Although all Arab countries accepted this strategy there was no commitment to implement it. Also, the Ministries of Health in Arab countries have limited authority over other government sectors within the same country, for example the Ministry of Education, as a result the expected outcome of this strategy may not be achieved. Moreover, there was no suggestion for a follow up to this strategy in the Arab countries. Therefore, the goal of the study is to explore the Ministry of Education's policies, schools' environments and teachers' perspectives to identify any factors that can affect children's body weight. This will lead to an understanding of the current situation of schools as a whole and ways to improve them.

Environment

A number of Saudi studies focused on the relationship between environmental factors and children's obesity. However, the fact is that the prevalence of overweight and obesity is rising among the Saudi population in all Saudi Arabian regions (El Mouzan et al., 2012). The study by Al-Nuaim et al. (1996) stated that the prevalence of obesity among 9,061 Saudi children aged 6-18 years old was 18% in Riyadh, the capital city of Saudi Arabia, whereas it was 11.1% among Saudi children in Sabea city which is located in the Southern region. Another study mentioned that overall, the prevalence of overweight differed between the Saudi regions. It was 13.4% among children in the South-West of Saudi Arabia, while in the centre it was 21% and in the North it was 20.1% (El Mouzan et al., 2012). Many factors led to this result, for example, the differences between the regions in regard to the facilities and access to physical activities (El Mouzan et al., 2012). The differences of regional economic status led to changed lifestyles such as the high prevalence of obesity in the eastern and central regions (El-Hazmi and Warsy, 2002b; Al Shehri et al., 2013). The high altitude in the Asser region in the Southwestern part of Saudi Arabia was a significant factor affecting body weight among

Saudi children (Khalid, 2008). The difference in the weather between regions can affect children's physical activities (Al Dhaifallah et al., 2015).

Gender

Many studies reported that there was a gender difference in regard to Saudi children's body weight. A few studies mentioned that the prevalence of obesity among girls was greater than among boys in Saudi Arabia (Khalid, 2008; Al-Enazy et al., 2014; Al-Mohaimed et al., 2015). A study by El-Hazmi and Warsy (2002b) examined the prevalence of overweight and obesity among children aged 1 to 18 years old from different provinces in Saudi Arabia and stated that the girls had a higher prevalence of overweight and obesity than boys. The study by Al-Shammari et al. (2001) refers to three reasons. Firstly, the widespread availability of housemaids in Saudi houses. Secondly, Saudi cultural attitudes restricting physical activities and hormonal factors. On the other hand, a few articles mentioned that boys were more overweight and obese than girls in Saudi Arabia (Al Alwan et al., 2013; Abalkhail, 2002; Collison et al., 2010). The study by Amin et al. (2008) concludes that unhealthy food consumption and socio-economic status may be associated with obesity among Saudi boys.

Students' knowledge

A few Saudi studies mention students' knowledge as important in the move to control obesity among Saudi children. A study by Abalkhail et al. (2002), conducted among 2,860 children aged 9-17 years old in Jeddah, showed that more than half of the schoolchildren were unaware of their body weight and the rest (approximately 40%) underestimated their body weight. A cross-sectional study by Al-Rukban (2003) conducted among 894 Saudis aged 12-20 years old found that 23.4% of adolescents could not judge their body weight. Moreover, 20% of participants who were overweight did not think that they were overweight. Another study by Mahfouz et al. (2008) reported that only 7.4% among obese

adolescents actually thought they were obese. One study mentioned the factors that can impact on children's knowledge, it noted that the main sources of health knowledge for children came not from primary healthcare centres but from television, magazines and newspapers (Taha, 2008). Al-Khaldi et al. (2014) stated that the role of every person is to understand the whole picture of obesity. This includes understanding obesity and its consequences for health; understanding the importance of regular checks for body weight; understanding the benefits of regular physical exercise and exercising for at least 45 minutes five days a week; understanding food content and eating a healthy diet.

Conclusion

The purpose of this chapter was to understand the national and global views of children's body weight. This was accomplished in two stages. Firstly, a deep understanding of children's body weight globally was gained through the WHO, particularly its intervention in the Eastern Mediterranean Region, and understanding common factors affecting body weight globally by exploring a summary of WHO recommendations. Secondly, the Saudi literature review relating to child obesity was explored.

From the first part of this chapter, it is obvious that the prevalence of obesity is increasing sharply in many countries, and obesity can have an adverse effect on a child's health both when they are young and later in their life. Factors such as actions of authorities, physical inactivity, dietary habits and the environment lead to children's obesity. Therefore, there are many efforts, initiatives and guidelines and a global strategy on diet, physical activity and health from the WHO aimed at helping countries to maintain children's healthy body weight. The second part of this chapter reviewed a number of themes that emerge from a Saudi literature review relating to child obesity. This chapter established that Saudi schools have an impact on children's health. Therefore, schools need to ensure that school curricula and school environments support physical exercise and help students to maintain healthy body

weight. However, school efforts alone cannot achieve a good level of students with healthy body weight, it requires support from many different sides such as parents, the community, the health sector and the education authority.

Much of the Saudi literature since 2001 calls for an urgent national programme to prevent and control obesity among Saudi children (Al-Shammari et al., 2001; Al-Hazzaa, 2002; Al-Rukban, 2003; Mahfouz et al., 2011), while a few studies call for a national policy to promote physical activity among Saudi children (Al-Hazzaa, 2002; Al Hazzaa, 2004; Al-Hazzaa et al., 2011). Another three studies call for public health interventions to prevent and control obesity (Abalkhail and Shawky, 2002; Abalkhail et al., 2002; Abalkhail, 2002). Yet nothing is written in Saudi literature about the potential for any of these programmes to be implemented as national Saudi programmes.

The knowledge gap from the Saudi literature is that although schools should take responsibility for improving students' healthy body weight, no study has examined the current situation of the schools environment in related factors that can affect students' body weight. Therefore, this is the first study to explore schools in detail and contributing factors that could affect body weight among boys. As mentioned before, in Saudi Arabia there are three types of primary schools with different rules and regulations. The aim of this study is to explore each of the three types of primary school (Public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia and to make recommendations for future policy and practice.

CHAPTER THREE: METHODOLOGY

Introduction

The aim of this chapter is to explain how this study commenced by outlining the study process. The chapter begins with the research questions, aim and objectives. This will be followed by the study method, case studies, study access, sampling and recruitment of the schools, data collection methods including observation, interviews with children and teachers and document analysis. Ethical approval is also discussed.

The aim

The aim of this study was to explore each of the three types of school (Public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia.

Objectives

- To explore schools' policies and environments to identify factors that could affect children's body weight.
- To explore the teachers' and managements' perspective in terms of any potential factors that could affect children's body weight.
- To explore the current understanding of healthy food, lifestyle and obesity among boys in Saudi Arabia.

Methods

The aim of this study was to explore factors that can affect body weight among boys in three types of school in Saudi Arabia. Thus, a qualitative methodology was chosen to generate in-

depth information, to explore the school environment and to understand the perspectives of students, teachers and management. A case-study approach was adopted. This approach allows more flexibility to use a variety of methods within each school to understand and compare the three types of school. This will give a holistic picture of factors that affect Saudi students' body weight in primary school.

In qualitative research, data can be generated from different sources, such as interviews, observation and documentation (Yin, 2009). Therefore, this study used these three methods to observe the school environments, interview teachers, children and analyse any important documents related to the study. Analysing data from this study might identify any possible recommendations and interventions that could be made.

Case Studies

Case studies have many different applications. Hakim (1992) classified the case study approach into three types: experimental, descriptive and selective. Stake (1995) also classified case studies into three categories: Collective studies, which are used when a researcher wants to study more than one case together; Intrinsic case studies which are cases of interest to the researcher: this would be consistent with "descriptive" case studies (Yin, 2003); and Instrumental case studies, which use one case to try to understand another thing. In contrast, Yin (2009) suggested that case studies can be classified into three types: explanatory, descriptive and exploratory. Explanatory case studies are used to connect an incident with its impacts and are appropriate to verify causality, whereas exploratory case studies are often conducted to determine study hypotheses and research questions. On the other hand, descriptive case studies are used to explain incidents and their context. Through a review of the literature, it is clear that each of these applications can be used in single or multiple case studies. However, researchers should choose the type that is capable of being adapted to their particular research problems (Burton, 2000). Through understanding these

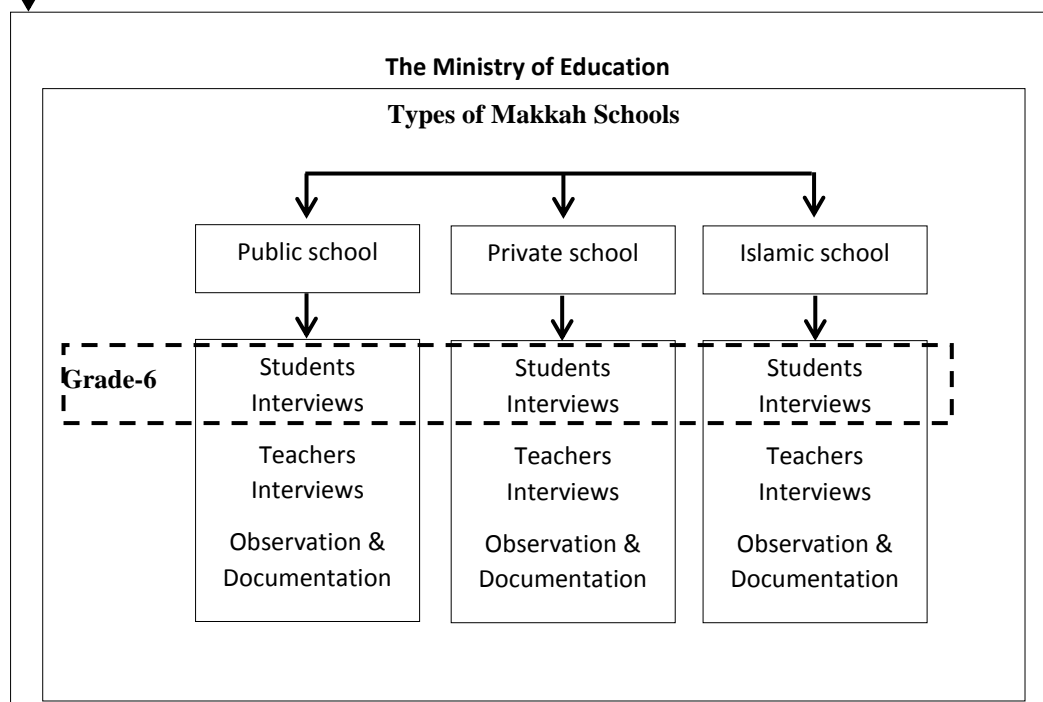
three classifications, I excluded an explanatory and descriptive case study and found that the appropriate type for the present study is an exploratory case study, because this research involves gathering information from different sources, such as observation, interviews with students and teachers and document analysis to explore any factors that affect body weight among Saudi students in primary schools. Many scientists believe that the case study approach is appropriate in the exploratory phase of an investigation (Yin, 2009).

Case studies have a long history in many fields, such as social science (Burton, 2000), medicine and law (Burns, 2000). In spite of the extensive use of case studies, there is still debate about how they should be defined. In fact, in 1992 this controversy led to a book being written on the issue (Burton, 2000). Overall, cases can be defined as “individuals” “events” and “programmes” (Yin, 2009), or as countries or organisations (Burton, 2000). Moreover, a case can be a class, a school, or a student (Burns, 2000). However, according to Yin (2009), case studies attempt to draw attention to one or more issues and to answer in detail what causes these issues, how they are carried out, and what are the consequences. As stated by Burns (2000), this approach focuses on discovery instead of confirmation. The focus of the present study was on factors that affect children’s body weight. There have been numerous previous studies of children’s body weight undertaken outside the school setting, and many of the studies conducted inside schools have focused only on the prevalence of obesity among students. However, controlling obesity among children requires strong efforts and collaboration. My two supervisors and myself discussed at length whether students or school will be the case, and because this study focused on schools we agreed that the ‘school’ is a single case study, using a variety of methods for data collection to represent the most appropriate information for this study. This approach also allows comparison of the final findings between cases of different types (private school, Islamic school and public school). Thus, each case was a school, chosen because it typified one of the three types of school in Saudi Arabia.

Many sources state that there are different types of case study. Burns (2000), in his book, presents six types of case study: clinical case studies, historical case studies, situational analysis, oral history, observational case studies, and multi-case studies. Hilliard (1993) also mentions a number of case studies, such as single case experiments, narrative case studies, single case quantitative analysis, and combined qualitative and combined quantitative studies (Brewerton and Millward, 2001). Yin (2009) suggests four types of case study designs, single-case (holistic) designs, single-case (embedded) designs, multiple-case (holistic) designs and multiple-case (embedded) designs. The present study took a multiple case study approach. Burns (2000) was of the view that a case study with a bounded system will be stronger. This study used a bounded system to study how boys in Saudi Arabia perceive body weight by geographical area (Makkah), type of school (Public schools, Islamic schools and Private schools), grade (6) and time (second term) The role of this bounded system is described in Figure 3.1.

Saudi Arabia

FIGURE 3.1: TYPES OF MAKKAH SCHOOLS



Although case studies have many positive points, such as using multiple sources of evidence and collecting in depth information, the case study method has faced criticism. The greatest concern is representativeness and whether the result of a case study can be generalised (Burton, 2000). This issue can be described as generalisation (Brewerton and Millward, 2001). The second objection to the case study approach is lack of rigour (Yin, 2009), which increases subjective bias (Burns, 2000). The third concern is that when a case study uses different methods, it can be very time-consuming and end up with massive data collection (Burton, 2000, Burns, 2000). I found that this was a challenge, so with more reading, I found that there are various recommended strategies that can help to resolve these issues (Burns, 2000). One such strategy for making a strong case study is what Burgess (1984) called 'multiple strategies' which means the use of a variety of methods, investigators, theories and data within the study.

This idea came from Denzin (1970), who classified triangulation into four types: data triangulation, investigator triangulation, theory triangulation and methodological triangulation (Burgess, 1984). Triangulation is a case study, using two or more methods of data collection, which improves its internal validity (Burns, 2000). Therefore, I used many strategies, such as studying more than one case so we have three cases of schools. This brings evidence from multiple case studies making it more robust than single case studies. This also allows comparison and contrast between the three cases. Moreover, I used random sampling of schools to make high generalisability of the findings.

Many methods can be used to generate case study data. Yin (2009) stated that there are six major sources of data in cases studies: documentation, archival records, interviews, direct observation, participant observation and physical artefacts. Data can also be generated using the methods of previous research or reports as examples the Foresight Obesity System Map in the present case (Butland et al., 2007). Each method has its own classification and

principles. For example, interviews are classified into two types, structured and unstructured (Yin, 2009). Documents can be classified into primary and secondary sources (Burgess, 1984). Burns (2000) outlines many important issues with regard to case study sources: for example, the fact that using one source of data leads to poor results, whereas using more than one source of data leads to stronger results, even though it creates more pressure for the researcher. He also indicates that interviews are a good method for generating information.

The Foresight Obesity System Map (Butland et al., 2007) includes seven themes: the physiology cluster, the individual activity cluster, the physical activity environment cluster, the food consumption cluster, the food production cluster, the individual psychology cluster, and the social psychology cluster. Six of the themes are useful as they provide a framework and guidance on obesity and its complexities in this study but the physiological cluster was excluded, because it is beyond the scope of the present study, and it would have been difficult to get approval from the Ministry of Education in Saudi Arabia to investigate this aspect. Therefore, I used the six remaining themes from the Foresight Obesity System Map as a guide during each stage of the data collection process in the current study. The six clusters are explained in Table 3.1.

Table 3.1: The Themes from the Foresight Obesity System Map

	Themes	Observation	Documents	Interviews	
				Teachers	Students
1	The individual activity cluster, which consists of: <ul style="list-style-type: none"> Exploring school timetables and how many physical exercise lessons are provided. Understanding students' health information about body weight. Observing students in school during physical exercise lessons. 	✓	✓		✓
2	The individual psychology cluster, which involves <ul style="list-style-type: none"> Observing students dealing with each other during the school day. 	✓	✓		✓

	<ul style="list-style-type: none"> Understanding factors that affect students' food choices. Exploring the level of parental control of students; food. 				
3	The social psychology cluster, which captures: <ul style="list-style-type: none"> Factors at a social level, such as media. Social attitudes to body weight. 	√	√	√	√
4	The food consumption cluster, which includes: <ul style="list-style-type: none"> The food market in schools. The level of food in school canteens. The variety of canteen food. The nutritional quality of food and drink. 	√	√	√	√
5	The physical activity environment cluster, which includes: <ul style="list-style-type: none"> Exploring schools' facilities for physical activity Exploring schools' barriers to physical activity 	√	√	√	√
6	The food production cluster, which includes: <ul style="list-style-type: none"> Schools' canteen systems School canteens and headteachers' responsibility Schools canteens and teachers' responsibility 	√	√	√	√

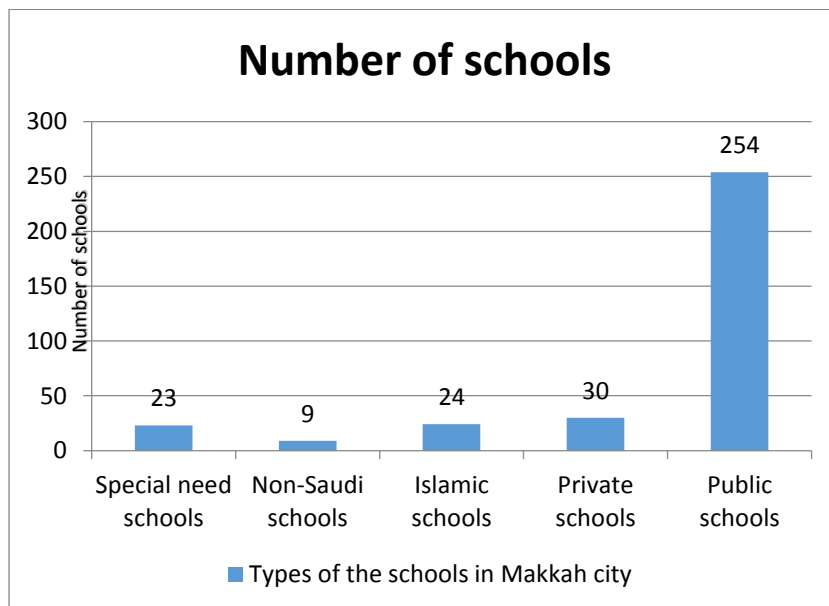
Much of the literature about children and healthy eating has focused on those aged below 13 years of age (Babooram et al., 2011; Welch et al., 2004; Gualdi-Russo et al., 2008; Wofford, 2008; Brown and Summerbell, 2009). In 2010, children accounted for 28.8 % of the Saudi population, and the majority of them were in primary schools. This study focused only on boys rather than both genders, because in Saudi Arabia, boys and girls study in separate schools and do not mix due to cultural and religious beliefs. Therefore, as a male researcher, I would not be permitted access to girls' schools. This qualitative study used three data collection methods - semi-structured interviews, observations and documentary review - to examine factors promoting healthy eating and balanced activity levels, and factors contributing to obesity, in boys' schools in Saudi Arabia.

Access, sampling and recruitment: the schools

This study has included all three school types (public schools, Islamic schools and private schools) for two reasons. Firstly, these types of school are distributed throughout the country. Secondly, these schools have many similarities but also many differences with regard to school buildings, facilities, curriculums, food supplies and systems, and thirdly, the study was focused on Saudi boys. Thus, this study chose all primary schools with more than 400 students enrolled in total in Makkah city, Saudi Arabia, from the different types of school. I chose schools with large numbers of students in order to increase access and to reach many of the participants in the study.

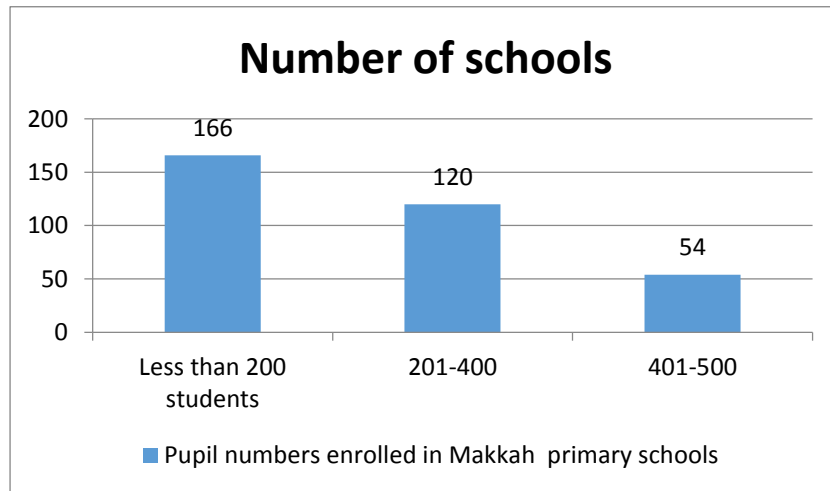
Makkah city has 340 schools. These schools include special needs schools, non-Saudi schools, Islamic schools, private schools and public schools, as shown in Figure 3.2.

FIGURE 3.2: schools in Makkah city



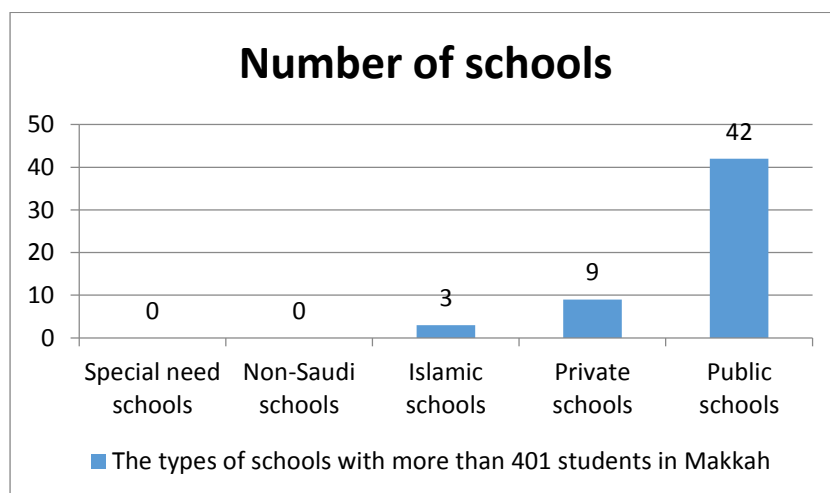
These schools were divided according to the total number of registered students (Figure 3.3).

FIGURE 3.3: Pupil numbers on roll in Makkah primary schools



As shown in Figure 3.3, fifty-four of these schools have more than 400 students enrolled in total. Selecting schools with large numbers of students offers a wide range of participants from different backgrounds and social levels, this might increase understanding by allowing the inclusion of a wide range of different views. These schools were divided according to type (Figure 3.4).

FIGURE 3.4: The types of schools with more than 401 students in Makkah



As shown in Figure 3.4, there were 54 schools with more than 400 students enrolled in total: forty-two public schools, nine private schools and three Islamic schools. Non-Saudi schools and special needs schools had less than 400 students and did not match the study criteria.

The Ministry of Education supervises and controls rules and regulations in all types of schools and the role of schools is to put these rules and regulations into practice. As previously described, it is necessary to be sensitive to the different school types and so I have made a purposive sampling of the cases representing an Islamic school, a public school and a private school.

Study access

Access to government

The process of gaining access to the study site for data collection began in mid-April 2014, with a visit to the Director of Makkah's Ministry of Education to explain the research goals and aims, and to request official approval. It was a formal meeting, and their concern regarding the topic was obvious. From the discussion, it was clear that they realised the great responsibility held by teachers, families and the community for maintaining children's health, especially with the effects of urbanisation on adults' and children's health. They also showed an interest in being informed of the results of this study in order to take advantage of them. So, I agreed that I would do so. After this meeting, I went to one of the departments of the Ministry of Education so we could identify the target schools. By the end of that day, I had received the official approval with the list of target schools (Appendix I). I therefore decided that I should visit the heads of the education sectors to explain the research process and encourage each particular school to participate. However, they said that official approval had been sent to the schools directly, so I could contact headteachers immediately, which saved both time and effort.

Access to the schools

After deciding on the participating schools, I arranged to visit the head of each school to explain the research and the research process, which included dates to determine when to

meet the parents and teachers and to distribute the school announcement posters (Appendix II). It was difficult to find the location within the school in all three types of schools, and when I entered a school, people would guide me to the headteacher's office. I felt that I was a stranger, and all the school staff wanted to understand immediately who I was and why I was there! The majority of them thought that I was coming as a supervisor to the teachers or to the school. Nonetheless, I felt they relaxed once I started to introduce myself to the headteacher and provided them with the official approval from the Makkah Ministry of Education. After their hospitality, I outlined my action plan for the study. All members of the schools, the teachers and the students were very cooperative during the study.

Access to the children's parents

I visited each school on a pre-determined date to meet the parents. Access to the children's parents took place via two methods: firstly, by holding a parents' meeting at the school, and secondly, by sending consent forms to the parents by their children. I held a parents' meeting at every school, and the meeting took place one hour before the end of the school day, as recommended by the headteachers, as it meant that parents could come early to attend the meeting and then take their children home at the end of the school day. However, not all the children's parents came to the meeting so I had to ensure that children whose parents did not attend the meeting would take a parental consent form home. The headteachers started the meeting by welcoming the parents and giving a short talk about the school and the importance of parental involvement with the school, they then introduced myself. I began by explaining the study in detail, and I answered all of their questions and inquiries. At the end of the meeting, I gave out the parental consent forms (Appendix III) to request their consent for their children's participation in the study. Parents could either return these forms immediately to the class teacher or return them with their children later on. The majority of the parents signed the consent form and returned it immediately to the headteachers.

Sampling and recruitment: the students

I had already been given the majority of the parental consent forms at the parents meeting so I arranged a time with the class teachers to visit the school to collect the remaining parental consent forms. I then wrote a list of the names of students who wished to participate.

I was concerned that I would have sufficient numbers for the study sample, that parents and children would agree to participate in the research. This was a particular concern in relation to the children, because I was committed to securing children's participation consent from both the parents and the child (Appendix IV). It is therefore possible that the parents would agree to their child participating in this study, but on the day of the interview, the child could refuse to take part. Therefore, large schools were selected as they had a wide range of participants from differing backgrounds. In qualitative studies the sample size is enough when the meaning is explored; therefore, the sample size for this type of study is recommended to be from 5 to 25 participants (Creswell et al., 2007). The sample comprised those students who agreed to participate in the study and had consent from their parents. Lists of eligible students were ordered alphabetically, and before starting each interview, a support group was identified from the school team to cope with any unexpected situations during the interviews. I used the Risk Assessment guidelines set out in (Appendix V). I scheduled a time and a convenient place in each school to conduct the semi-structured interviews with students.

Sampling and recruitment: teachers and managers

A time was arranged to meet teachers in each school to explain the research purpose, aims, their right to participate and their right to withdraw from the study. Information sheets with consent forms (Appendix VI) were distributed to them and I gave them one week to decide

whether or not to participate. I asked the teachers to hand back the consent forms to the headteachers, he then arranged a time for me to visit them to conduct the semi-structured interviews at the schools or at other locations that were convenient to the interviewees, as long as they were suitable places to conduct the interviews.

The target population for this study was between 10 and 15 teachers and managers. The first sample comprised teachers who taught grade six and were willing to participate in the study. I took into account the teachers' timetable and the busiest periods of the school days. I thus scheduled convenient times and places for them to conduct the semi-structured interviews. These interviews were guided using the questionnaires provided in (Appendix VII) and each lasted between thirty minutes and an hour.

The second sample comprised any member of the management team who was willing to take part in the study. However, when I went to interview them at their offices, I explained the purpose of my study and asked if anyone would be interested in being interviewed by me. Unfortunately, nobody wanted to be interviewed. When I tried to establish the reasons for their unwillingness to participate in this study, I discovered that there were three reasons. The first reason is the topic; it seems that the topic of the study is complicated because it involves many departments. Secondly, they were afraid to talk about other departments' responsibilities. Thirdly, they were concerned about the use of the recording device in the interview. However, one of them agreed to be interviewed on condition that I did not record the interview. I agreed to this request, but when we started the interview he received a phone call, after which he asked me to stop interviewing him; it seemed to me that the call came from his boss. Therefore, this study excludes the management level because of the difficulty in obtaining access.

Data generation methods

This qualitative study used three data collection methods observations - semi-structured interviews, and documentary review - to examine factors promoting healthy eating and balanced activity levels, and factors contributing to obesity, in boys' schools in Saudi Arabia.

Observations

Observation, with or without participation, has been used for many years in qualitative research. Gillham (2000a) stated that the researcher should collect data from different sources and should not depend on interviews, but should go beyond them, generating data using observational methods. Bryman (2012) stated that there are many major types of observation in research: structured observation, systematic observation, participant observation, non-participant observation, unstructured observation, simple observation and contrived observation. The best observational method is one which records everything as it occurs (Burns, 2000). Unstructured observation entails recording as much detail as possible about participants' behaviours, environment, setting and events as they occur in order to develop a meaning for that behaviour (Bryman, 2012); also, recording detail has the advantage of allowing researchers to develop an understanding of an unknown topic (Bowling, 2002). This appeared to be the best approach for the present study. The main aim of the current study was to explore each of the three types of school in terms of factors that can affect body weight among boys in Saudi Arabia. Therefore, unstructured observation was used to observe everything related to this topic in the hope of identifying a wide range of factors that can affect children's body weight.

From the literature, it is clear that the observational method is concerned with many issues, such as being an insider or an outsider researcher (Bonner and Tohurst, 2002) and observation time (Burgess, 1984). Both insider and outsider positions have many advantages

and disadvantages in this study, I considered myself to be an outsider researcher. The time of observation is one of the most important issues in qualitative research, as there is no ideal amount of time to spend (Ritchie et al., 2003). This study focused on schools, which are structured by many important periods of time, such as the time of daily school entry, study in classes, activities outside classes, meal times and school closing time. It includes observing the school's facilities, environment, playground area, food timing, food stores, food supplies, food quality and eating area, and recording data using the themes mentioned in the Foresight Obesity System Map (Butland et al., 2007). Moreover, each school has its own activities and concerns. Therefore, the observations for this study were conducted by visiting each school type over five days.

I made notes in a diary during each visit and then transferred the notes to my computer as soon as I returned home, as most researchers recommend recording the notes from the observation period as soon as possible (Mulhall, 2003). One important point is that I handled the observation data in the same way as the interview data.

Approach to observation

I met the headteacher at each school to explain the research process, and I put up posters inside the school to explain the study and to give details of the time and date of the visit and my contact details. As it would have been very difficult to obtain consent from all the teachers and students in the school. I arranged with the headteachers that I would arrive the following day at 7am to participate in the early morning meeting with staff and students and explain the study process to them. It was difficult to stand up in front of so many teachers and students in the first school. However, during the speech, I outlined the study and assured them that they had the right not to be included in the study. If most of the school staff and students declined to participate, I would use another school.

Fortunately, all the schools I visited had no problem with me using observation as a research method. Therefore, on the first day I started observing the school from outside the building and observing the administration office from inside. On the second day at the first school, the headteacher asked a teacher to take me to see inside the school. This was a great opportunity because it helped me to understand the school environment, introduced me to the teachers and students, and helped me familiarise myself with the school facilities. Therefore, I kept in mind that in any school, I should start by making a round with a teacher and should the headteacher not suggest it, I would ask them to do so. On the third day, I conducted observations from 7am until 11am, and on the fourth and fifth days, I conducted observations from 11am until 2pm. In this way, I covered the whole school day. During this time, I made decisions regarding whether to stand apart as an observer or to participate, as might be appropriate. I sat with teachers in their rooms and I observed students during their breakfast time. In addition, I observed students at physical activities, and I participated with schools in prayer time. While I was inside the schools taking notes, I tried to give the students and the teachers the impression that I was busy with papers and books so I could observe them in their daily activities. Throughout the observation period on the fourth and fifth days, I observed the school's facilities, environment, playground area, meal times, food stores, food supplies, food quality and eating area, and recorded data.

I used the six themes from the Foresight Obesity System Map (Butland et al., 2007) as a guide to observation, a printed copy of the table was carried with me to each school to ensure that I would observe what was mentioned in that. As stated previously, the six themes included the individual activity cluster, the physical activity environment cluster, the food consumption cluster, the food production cluster, the individual psychology cluster and the social psychology cluster (Appendix VIII).

I tried to focus on data that would help me to meet the study's aims and objectives. I observed and described anything that happened, such as incidents, games, students' dress, noise and movement. I did not collect data that might lead to identification of the students or teachers.

I spent three weeks conducting observations at three different types of school. I started by observing the public school, then the private school and finally the Islamic school, collecting 60 hours of data in total, which was sufficient to achieve the study goals. I made notes in the diary every day, and then wrote up these notes immediately on the computer when I returned home.

Interviews

An interview is a conversation between two people wherein one of them is seeking responses to meet a specific aim (Gillham, 2000b). Qualitative interviews are commonly used in research as well as in other fields, such as medical consultation and marketing (Gillham, 2000b). There are many ways to conduct interviews, including individual and group discussions which may take the format of focus groups or brainstorming (Frey and Fontana, 1991). Interviews in qualitative research have been classified in many ways, but the most commonly used are structured, semi-structured and unstructured interviews (DiCicco-Bloom and Crabtree, 2006).

The semi-structured interview is one of the key recommended methods for gaining qualitative data (Pope et al., 2002). A study by Hill et al. (1996) recommends two ways of engaging with children: individual interviews and focus groups. This study used semi-structured interviews with individual children, because this approach enabled me to gather more in-depth information, particularly when keeping the study goals in mind (Morison et al., 2000). There are many variables which can affect interviews with children, such as their

personal characteristics and the place where the interview takes place: the exit door should be clearly visible, and the place needs to be familiar to children so that they feel comfortable (Morrow and Richards, 1996). For the children, I designed a children's pamphlet to encourage them to interact with the interviews (Appendix IX). I used the six themes from the Foresight Obesity System Map (Butland et al., 2007) as support during the interviews and I used three questions relating to this study, which were 'What advice would you give to people who want to have a healthy body weight?'; 'What advice would you give to people who want to increase their body weight?'; and 'What advice would you give to people who want to decrease their body weight?' (Rees R et al., 2009).

The second aim of this study was to explore the opinions of the teachers (n=10-15) regarding any factors that could affect children's body weight; this study used in-depth semi-structured interviews with the participants to gather additional information. I also used the six themes from the Foresight Obesity System Map (Butland et al., 2007) as support in semi-structured interviews to explore their views with regard to: students' health situation in the school, the health education programme in the school, students' health behaviour, students' food provided by the school, students' awareness with regard to body weight and respondents' understandings of children's beliefs and practices around weight and obesity.

Approach to interviews: children

This study was undertaken in Saudi Arabia. The inclusion criteria of students were male Saudi students in grade six, between 11 and 12 years old, who agreed to participate, and whose parents were willing to let them take part in the study; I excluded students who did not wish to participate or those with parents who did not want them to participate. Before the day of the children's interviews, the headteachers provided me with a list of the students who had agreed to participate in the study and nominated two teachers to help in the interview process. So, we had a useful meeting before the day of the interviews and talked about the

study process and agreed to a classroom where the students would wait and where the interviews would take place, we also decided on a place for student support in case of any risk arising during the interviews.

On the day of the interviews, the class teacher called the students one at a time to participate in the interviews in an empty classroom. I noticed that no child was absent because I was prepared to call the next child on the list to take the missing student's place. When the student came to the interview, I welcomed him and asked him to choose the place where he would feel most comfortable, I showed him the digital voice recorder and explained that the interview would be recorded. The majority of them agreed to the interview being recorded; however, a small number of students asked for more detail, so I allowed them to touch the recorder and I demonstrated it so they could understand how it would be used.

Once a student had accepted that, I gave him a pamphlet and started by introducing myself, I then outlined the purpose and the process of the research. I asked the student to show his agreement to participate by putting a tick on the box in the cover page of the pamphlet; when I asked them to do that, they were happy to sign the agreement. In fact, I found that the children's pamphlet was a very useful way to break the ice with the children and to increase the method of communication with them. Some of them started to read the pamphlet immediately, whereas others asked for the instructions. I started to talk to them and let them use the pamphlet when they wanted. A few of them preferred to talk instead of writing in the pamphlet, but the majority of them liked to use the pamphlet and talk. I started with some exercises to break the ice, such as asking the child to take a few minutes to draw or to write about anything he liked in the pamphlet. Some of them enjoyed this activity. I informed each child that I would like to ask him many questions, and that he had the right to answer them verbally, by writing words or drawing, or not to answer at all. The pamphlet was used as a guide to direct the interview.

At the end of the interview, I thanked every student for their participation. I surprised them by letting them choose a gift (Pen and medal) in appreciation of their participation. Then I took every student back to the classroom. In the case of unexpected situations arising during the interviews, I planned to use the Risk Assessments guideline (Appendix V), but I did not need it during any of the interviews with the students. The total number of students whom I interviewed in this study was 33 students: 12 students from the public school, 12 students from the Islamic school, and 9 students from the private school.

Approach to interviews: teachers

The second target group of this study was teachers at the primary school in the three types of schools. The inclusion criteria was teachers in the school who had agreed to participate. Before the day of the teachers' interviews, the headteachers provided me with a list of those teachers who had agreed to participate. I contacted them to arrange suitable times and places for the interviews to take place. All the teachers preferred to be interviewed at the school in their free time, that is, when they had no teaching duties.

The day before each interview, I called the participant to confirm the details. All the teachers were happy for me to interview them, and no teacher cancelled. On the day of the interview, I arrived at the identified place 15 minutes early to arrange the environment and prepare for the interview. When each participant arrived, I asked him to choose a comfortable place to sit, and asked for his permission be recorded and for me to take notes. The majority of the teachers accepted that, though some of them were surprised that I would be using a voice recorder; this led me to wonder why they were confused as it was written on the information sheet. It seems that some of them had signed the consent forms without reading all of the details. Therefore, I started by introducing myself, and then outline the purpose and the process of the research by reading the information sheet; once the teacher had agreed, I started interviewing him.

The interviews were semi-structured in form and focused on participants' perspectives of children's knowledge around the topic of obesity. Semi-structured interview questions were used to guide the interviews (Appendix VII). At the end of each interview, I thanked the teacher for his participation. I interviewed 18 teachers in this study; that is, 6 teachers from each school. All of the interviewee teachers from the private school had Bachelor degrees, and all had more than one year's experience, except one who had joined the school less than 6 months previously. There were two Arabic teachers, one English language teacher, one maths teacher, one sports teacher, and one science teacher. The majority of them were non-Saudi.

The total number of teachers interviewed from the Islamic school was six, all had Bachelor degrees in background to Islamic studies. The total number of teachers interviewed from the public school was six teachers; there were two Arabic teachers, two Islamic teachers, one maths teacher, and one science teacher, and all of the teachers in the public school were Saudis.

Documents

According to Yin (2009), documentation is one of the major sources of study data. It is important to use documents in case studies (Burns, 2000). There have been many debates as to the division of types of document. Burgess (1984) classified documents according to primary and secondary sources. Primary sources are those noted by the researcher, whereas the secondary sources are published documents. Denzin, (1970) classified documents into two categories: public and private (Burgess, 1984).

Approach to documentation

During the period of this study, I talked to the headteachers of the schools many times to understand the school system. They were cooperative, but there were many interruptions

because they had to answer the school telephone, deal with teachers' questions, and solve students' problems; these responsibilities made them very busy with school issues.

A number of methods were used to search for documents related to the study. I asked the headteachers for any important documents that were relevant to the study aim and objectives, and they guided me to documents such as school timetables and the posters on school notice boards. Through these discussions, I developed an understanding of the method of communication between the schools and the Ministry of Education. One method of communication was using the Ministry of Education website and the Makkah Education web page to download official papers. Therefore, I searched for any documents related to the topic on both websites. I found many reports, standards, and guidelines related to school rules and regulations, some of which related to this study. Unfortunately, when I came back later to view other documents on the Ministry of Education website, I found that they had upgraded their website, and I could not find the previous documents. Therefore, I searched again on the websites of branches of the Ministry of Education until I found the Hail Ministry of Education Branch, this had many important documents from the Ministry of Education. Thus, I downloaded the related documents to analyse them. In addition, in discussions with the private school headteacher, he recommended that I look at school web pages. Therefore, I decided to search for the three schools' websites. Unfortunately, I found that only the private school had a school web page, which was rich in pictures and school reports. Finally, using a variety of methods, many documents relating to the school systems were identified and collected.

Approach to analysis

The data for this study were generated from several different sources, namely interviewing students and teachers, observation and gathering documents. The data analysis in this study involved four key stages. The first stage was transcribing of the recordings into written form.

The second stage was to analyse the interviews. The third stage was to analyse the observation and documents. All types of analysis were based on each school category individually to develop a standalone comprehensive description of each case. The fourth stage involved conducting a comparison of the three cases to find the similarities and differences between the three types of school.

Approach to analysis of teachers' interviews

This study used the method advocated by Braun and Clarke (2006), known as thematic analysis, to analyse the data. Thematic analysis is a method used to analyse data in qualitative research by identifying themes that emerge as very important to the phenomenon (Thorne, 2000). According to Braun and Clarke (2006) thematic analysis is a way of identifying, analysing, and reporting themes within data. This method has many advantages: it is easy to learn, the results can be easily understood and long transcripts can be easily summarised (Braun and Clarke, 2006).

The first step was to transcribe the contents of the audio-recorded interviews. I listened to the recordings many times to ensure that the transcripts were accurate. Next I read the transcripts to familiarise myself with them. I read all the data from the interviews many times. My two supervisors read one translated interview and we discussed the method of data analysis. I read each interview separately and began searching for meanings, making notes for coding the ideas. I started generating initial codes. I read the comments again to make a list of ideas from the data. I then compiled a table using the list of ideas and started to produce initial codes from the data. I started to search for themes by making a list of the codes and combining them into potential themes. By the end of this phase, the data was organised into meaningful groups. During this phase, I focused on reviewing and refining themes. I went back to the original texts and found several themes that required changes such as combining them with other themes. The next stage was to define and refine the

themes, at this level, I identified the essence of each theme and determined which aspect of the data each of them captured. The last phase was to write the report. To establish which were the most important themes I decided to combine the themes with those of other participants. I then arranged the themes based on the number of recurrences among the participants. For example, all participants from the private school mentioned the school canteen in their interviews, whereas only four participants mentioned language as a barrier in their interviews. Therefore, I decided to list the school canteen as number one and the language barrier as number six, as shown in the table below.

Table 3.2: The frequent themes of the teachers' interview sample

No	Themes	Sub-themes	Participants mentioned the themes (Yes or No)						Total
			PT1	PT2	PT3	P2T1	P2T2	P2T3	
1	School Canteen	-	Y	Y	Y	Y	Y	Y	6
2	Teachers' role	-	Y	Y	Y	Y	Y	Y	6
3	Student unawareness	-	Y	Y	Y	Y	Y	Y	6
4	Ministry of Education role	1. Curriculum	N	Y	Y	Y	Y	Y	6
5	Family responsibility	1. family awareness	Y	Y	N	Y	Y	N	4
		2. Poor communication	N	N	N	Y	N	Y	2
6	Language barrier	-	N	N	Y	Y	Y	Y	4
7	Students' desire	-	N	N	N	Y	Y	Y	3
8	Students' awareness	-	Y	Y	N	N	Y	N	3
9	The impact of media	-	N	N	N	Y	N	Y	2
10	School programme	-	N	N	N	Y	Y	N	2
11	Students' food habit	-	Y	N	Y	N	N	N	2
12	The impact of the culture	-	Y	N	N	N	N	Y	2
13	Reflection of obese children	1. Student reaction Obese children	N	Y	N	N	N	Y	2
14	School facilities	-	N	N	Y	N	N	N	1
15	Lack of knowledge	-	N	Y	N	N	N	N	1
16	weather	-	N	N	N	N	N	Y	1

Approach to analysis of students' interviews

I started this process by collecting all students' pamphlets and transcribing the contents of the audio-recorded interviews. I listened to the interviews many times to ensure that the transcripts were accurate. After that I transferred the written transcripts onto the same student's pamphlet. So, each pamphlet contained what the student wrote and also what he said. By the end of these stages, I had pamphlets full of written information from students. My two supervisors had the opportunity to read one translated interview and we discussed the method of data analysis. I started reading the transcripts to familiarise myself with them. I read the data from the interviews many times and then generated initial codes. The comments were read again and a list of ideas was compiled using the data. This was transferred on to a table and initial codes were produced. I started to search for themes by making a list of the codes and combined these into potential themes, themes can give a fundamental understanding of the data to promote the findings (Bryman, 2012). By the end of this phase the data was organised into meaningful groups. On this level, I went back to the original texts and found several themes that required changes such as combining them with other themes, so I reviewed and refined themes. I then identified the essence of each theme and determined what aspect of the data each of them captured in order to define and refine themes.

Approach to analysis of observation

I started by familiarising myself with the data. To reach this level I needed to understand the data, so I read through all the observation data twice before making any comment. My two supervisors had the opportunity to read the translated data, we then discussed the method of data analysis and I accepted their viewpoints as a guideline for the data analysis process. I decided to ask three other researchers, two Ph.D. students and one overseas lecturer to participate in the data analysis. At the first meeting, I explained their role in this research

and gave them a copy of the data and a copy of the method that would be used for data analysis. At the second meeting I clarified their questions about several points in the data. At the last meeting, I received their data analysis and we held a meeting.

I read the observation of the third reading and began searching for meanings, I then made notes for the purpose of coding and highlighting the ideas. I read the comments again in order to gain an understanding of the highlighted words and compiled a list of ideas from the data. I then transferred this to a table and started to produce the initial codes from the data.

I searched for themes by making a list of the codes and then combined them into potential themes. By the end of this phase the data was organised into meaningful groups. I then focused on reviewing and refining themes. On this level, I had a list of themes and sub-themes. However, when I went back to the original text I found that some themes required new decisions such as combining them with other themes or creating a new theme.

I then started defining and refining themes. At this level I received two pieces of feedback on data analysis. A group meeting was organised in order to discuss the results. Unfortunately, only one researcher attended the meeting and we spent more than one hour in discussion. We identified the essence of what each theme was about, determined what aspect of the data each of them captured and then agreed to make some changes.

Approach to analysis documents

I gathered and read many official documents which were produced by schools and the Ministry of Education in order to understand the school setting. Some of these documents describe the job descriptions of the school team and others describe the school system in detail. Analysis of the documents led to a greater understanding of the school environment and increased understanding of the findings.

The first document was the children's timetables for each type of school, these showed the variety between schools in terms of physical activities. I used this document for the purposes of direct comparison between the three schools.

The second document was the Ministry of Education Achievement Report, this mentioned some of the activities that had previously been applied. For example, a three-year school nutrition project was implemented in the capital city in Saudi Arabia via a contract with one food company. This project was stopped after three years because the food company was finding it difficult to provide food for such a large city with different areas. Two other achievements related to this study were mentioned in this document, namely the school health education project and the national plan for replacing rented schools.

The third document was the job description for headteachers. There were two versions of this document: the first was from 2011 and an updated version from 2016. One of the changes in the updated document was a change in the title of the school headteachers from 'school managers' to 'school leadership'. This might be because nine additional powers were granted to school leaders. One of the new powers was related to breakfast time, so that the schools could decide whether to integrate breakfast time into one period or not.

The fourth document was a guide to the practice of general education schools for 2013-2014. This document classified the role of each sector in the Ministry of Education and provided guidance for schools on how to operate school canteens.

The fifth document was the health requirements and rules for school canteens. This document included ways of monitoring and supervising school canteens and set out terms and conditions for these canteens. This document contains information which helps the reader to gain an increased understanding of the school canteen system.

Conclusion of analysis

After looking at the results of all the types of data, observation, teacher interviews, student interviews, and documents, I realised that the finding could be presented in three ways. The first way would be to present the results for each school separately; using this method, there would be three chapters of data analysis, specifically, the public school analysis chapter, the Islamic school analysis chapter, and the private school analysis chapter. The second way would be to integrate the target groups, for example, data analysis of teachers from all schools, data analysis of students from all schools. Using this method would give four chapters of data analysis, which would include observation and documents chapters. The third way would be to integrate the schools and present the results as themes. My supervisors and I discussed these options, and decided that the best way would be to integrate the schools in order to determine which themes affected body weight among boys in Saudi Arabia.

My supervisors and I discussed the findings and the final findings after integrating all schools together showed four themes to be major factors that may affect children's body weight in the Saudi school. The data analysis process was conducted on three levels. The first level was analysing data as separate units so that each unit finding was revealed. The second level was to integrate similar units into one group. The third level was to integrate all groups into one to represent the final findings for the particular school. Figure 3.5, below, sets out the process of data analysis.

[illegible]

A number of different perspectives can be adopted when considering research with children. The first perspective is that children are the same as adults. In this approach, the researcher applies the same methods with children as those used with adults (James et al., 1998). From the second perspective, children are viewed as being different from adults. For example, children are at a different developmental stage from that of adults (Kortesluoma et al., 2003), and they are a vulnerable group because they are still going through the stages of physical development. This means that they do not function independently and this affects their ability to understand (Morrow and Richards, 1996). This project was conducted from the second perspective: it gave more attention to children's needs, because it is important for

children, under the UN Convention on the Rights of the Child, to be part of any decision related to their life (UNICEF, 2005).

This study was approved by the Research Review and Ethics Screening Committee (RRESC) and the Research Ethics Committee (REC) at the School of Healthcare Sciences, Cardiff University. Ethical approval was also requested from the Makkah Ministry of Education, Saudi Arabia, and approval was granted to conduct the study. Furthermore, care was taken to ensure that the necessary precautions were in place in order to protect the children from harm. These precautions were applied as outlined below.

Informed consent: children

Much of the literature is focused on whether to treat children taking part in research as passive or active participants in terms of their ability to give informed consent (Coyne, 2010). Broome (1999) suggests that children between the ages of 7 and 15 years old should be asked to fill in an assent form; however, the child's assent form is not enough for them to participate in the research, and must be accompanied by a parental consent form (Baines, 2011). Kon (2006) argues that honesty and clarity between health professionals and patients is very important, regardless of the patient's age. Moreover, seeking the assent of child participants shows respect for the autonomy of children and their ability to make their own decisions (Rossi et al., 2003). As such, child participants should receive an assent form to ensure that they understand the method of data collection being used before agreeing to participate in the research, and they should also be informed that they have the right to withdraw at any stage of the research.

In response to this literature, the project collected consent forms from parents (Appendix III) and also required children's assent. If any child declined to participate despite the agreement of his parents, I excluded him from the study.

At the beginning of the research process, the participant information sheet and the consent form (Appendix III) were sent to the headteachers of the target schools. The headteachers then gave copies to the grade six classroom teachers. The classroom teachers distributed them to their students and ensured that parents and children had sufficient time to read and reply to them. The classroom teachers followed up with all children, collected the participant information sheets and returned them to the headteacher so I could collect them from him.

Informed consent: teachers

Prior to the start of the interview I confirmed that the participant had signed the consent form (Appendix VI). The consent form included the purpose of the study, the right to withdraw at any time in the study, the role of the interview and their rights.

Ethics of observation

All teachers and students were informed of the time and date of the observation and given my contact details. I explained that they had the right not to be included in the observations for this study. When most of a school's staff and students agreed to participate, I started observing them within the time mentioned on the poster.

Confidentiality

This study has taken numerous steps to consider ethical issues from the inception of the project. The targeted groups were fully informed of the purpose and the processes of this research and were provided with an information sheet and given time to read it carefully. Any questions they might have were answered sensitively. They were informed of the reason why they had been chosen to participate as volunteers and care was taken to ensure that they understood their rights. It was confirmed to them that official approval had been granted from Cardiff University and Makkah Ministry of Education and they were informed that their interviews would be recorded for research purposes only, that their contributions

would be anonymous and that their data and transcripts would be treated with the strictest confidentiality and accessed by me only. They were asked to sign the consent form to confirm that they wanted to participate.

I was aware that the project had the potential to raise issues for participants around the issue of obesity. To avoid this, the interviews and data collection were carefully focused on general issues of obesity, rather than on the individual experience. However, I was aware that there might be instances of disclosure by the young people and by teachers of personal experiences of the impact of obesity, such as bullying. In response to such disclosures, the interviewer referred to and followed the Risk Assessment Guidelines set out in (Appendix V).

Withdrawal from this study

It was made clear on the information sheet that the children and their parents had the right to withdraw from the study at any time. Also, before starting the interviews, I ensured that each participant understood his right to withdraw from the study.

Storage of data

I initially used my own laptop computer. This laptop had two protected access systems, a password and 'thumb touch', which allowed only me to use this laptop. However, after data collection from Saudi Arabia and its arrival in the UK, all data were stored on the researcher's university computer and deleted from the personal computer. This included the transcripts and audio files of interviews. The university computer was password protected and was only accessible to me.

Conclusion

The chapter began with an introduction which included the study aim and objectives. Then the chapter discussed the study methods and the use of case studies. Then information

regarding the study sample and access to the target group was presented. There were many levels of access, starting from the Ministry of Education, schools, children, and parents. After that, the sampling and recruitment of the students and teachers was discussed, and this was followed by presentation of the data generation methods. These started by observation and how it was approached, followed by introduction to the interviews and how the interviews with students and teachers were approached. Then documents as methods of data generation and the approach to finding it were discussed. After that the approach to data analysis was presented, including how I would decide to present the data in this study. This chapter covered ethics as an important part of the methodology chapter and covered the informed consent of children and teachers, the ethics of observation, confidentiality, and withdrawal from the study, and how I would store the data of this study.

CHAPTER FOUR: OVERVIEW OF CASES

Introduction

This chapter describes the large social and organisational context within which all three cases are situated. The chapter will start by describing the city of Makkah, where the study was conducted, and give a brief description of the Makkah Ministry of Education. Then, this chapter will describe the three cases that have been selected in this study, which are the public school, the Islamic school and the private school, to give an in-depth understanding of each case regarding the school system, aims, some statistics and school finance.

Makkah city

Makkah is one of the most important cities in Saudi Arabia, and is located in the Western region of Saudi Arabia. Saudi Arabia's climate in general is lacking in rain and has a high temperature, Makkah features a hot desert climate (Ahmed, 1997). In 2010, Makkah had a population of 1.9 million (CDSI, 2014a). Makkah is a holy city that attracts millions of Muslims from all over the world because it is where holy sites such as the House of God, the Zamzam Well, Arafat area, Mina area and the place where the prophet Mohammed was born are situated. Hence, many Muslims choose to live there to participate in spiritual experiences such as praying inside the House of God and fasting during Ramadan. One of the important parts of Islam is visiting Makkah once in an individual's life to perform Umrah and Hajj. During Hajj, pilgrims need to move from place to place within Makkah at certain times and cross in the same way. In 2008, during the spiritual periods, there were almost 2.4 million visitors to Makkah from all over the world (Saudi, 2015). These issues relating to the influx of visitors require the Saudi Arabia government to give due attention to Makkah city in relation to facilities. Moreover, the government spend billions of Saudi Riyals projects to make Hajj

easier. For example the Jamarat Project in the Mina area and the Haram Project in Makkah centre (Saudi, 2015). These projects have facilitated much change in Makkah and in the residents' lives as a result. For example, these projects involve developing facilities such as new roads and trains. With regard to people's lives, the government is compensating those people who have lost their properties because of the projects. These people move away from the city centre to buy or build a house in any neighbourhood they desire because they are supported by the government. Therefore, Makkah projects are very important they will improve the city and make it more able to host two million people at the same time. Although these projects impact on places, buildings, surfaces, people and education, they are temporary action.

Makkah Ministry of Education

The Ministry of Education in Saudi Arabia has more than fifteen branches. Each branch is called General Administration for Education followed by the region name, such as General Administration for Education in Makkah. Therefore, the Ministry of Education decided to make centralised decisions on some important issues such as schools, textbooks and curriculum. For example, the Ministry of Education has established a department called a curriculum department. This department has a yearly responsibility for preparing, updating and printing school textbooks. In fact, each subject has a textbook, except physical education. Every year they send new textbooks to the Ministry of Education in each region. The Ministry of Education in each region will take the responsibility for distributing textbooks to each school, in their capacity. In Saudi Arabia, there are two projects for reforming the curriculum; the first project is the King Abdullah Bin Abdulaziz Public Education Development Project, and the second project is called the Developing Science and Mathematics Curriculum Project.

In Saudi Arabia, there are four basic educational levels. These levels are primary level (six years' duration), intermediate level (three years), secondary level (three years) and university level (almost four years). The primary school accepts children aged six years old, with the youngest being five years and ten months old. The primary school day is divided into 6 to 7 lessons, each lesson is 45 minutes long and there is a five-minute break between each lesson.

The Ministry of Education has many responsibilities and authorities so they delegate some work to the regional Ministry offices, such as Makkah Ministry of Education. For example, moving teachers from one school to another within Makkah city, regular supervision for schools, and evaluating teachers' outcomes. However, other responsibilities may be delegated to the school headteachers. For example, Makkah Ministry of Education is responsible for making regular visits to school canteens, to evaluate the performance of the canteen and write the quarterly canteen reports; these responsibilities and duties have been delegated to school headteachers (Alshaheri, 2013).

In Makkah, many buildings have been developed as government schools; in areas where there are no government school buildings yet, the government is renting houses to be used as schools. The buildings which were erected to be used as schools are much better than other schools with regard to the facilities, playgrounds and classrooms. In Makkah city, there are 24 Islamic schools, 30 private schools and 254 public schools. All of these schools are under the regulation of the Makkah Ministry of Education.

Summary

It can be seen that Makkah is an important, large, famous and attractive city. Therefore, the Saudi government is prepared to invest in improvements to the city's infrastructure. However, these actions may have a strong impact on the community. These improvements

require drawing up action plans, time and comprehensive work efforts between all of the government sectors.

Case Study 1: Public School

Introduction

My study commenced in mid-November 2014 at the public school in Makkah centre, which is an area with a strong business market. The school is surrounded by many small and large shops, markets and hotels. The public school is more spread in numbers than the three school types in Saudi Arabia.

School System

The public school accepts children aged six years old, with the youngest being five years and ten months old. The Ministry of Education established a website called Noor Web. This website has many functions such as a uniform way to admit students from all over the country to make the admission process easier, a means of transferring students one school to another and a way to follow up with teachers and print students' certificates. This website can be accessed by teachers, school managers, students and their families; however, some of these functions are not utilised. Tuition at this public school is free and the rules and regulations of the school are established by the Ministry of Education. The public school can accept students from different nationalities, but there are limited spaces. Like other public schools in Saudi Arabia, this school adopted the Saudi curriculum when the school was established, so it focuses on science as well as Islamic studies. There are two physical exercises lessons and two arts lessons in grade six per week, whereas there are eight lessons on the Arabic language and nine lessons about Islam, such as the Quran, Jurisprudence, Tajwid, and Monotheism. From the school timetable, it is clear that the school has eight subjects as shown in the table (4.1).

Table 4.1: The public school curriculum

	Subject		Number of lessons weekly
1	Arabic language		8
2	Maths		5
3	Science		3
4	Physical exercises		2
5	Arts		2
6	English		2
7	History		2
8	Islamic study		9
	1	Quran	4
	2	Monotheism	1
	4	Jurisprudence	2
	5	Hadith (Quotes from Prophet lives)	2

Public schools have regular standards for accepting new students, it is easy for students from public schools to transfer to another public school or a private school; the exception is Islamic schools, because they have one condition: when the student want to join the Islamic school he has to memorise chapters of the Holy Quran in accordance with other students of his level at the Islamic school.

School Aims

The primary school is the place where students learn basic knowledge. This level will provide students with the basics of the Islamic faith, information, experiences and skills. According to MOE (1995b) primary schools in Saudi Arabia have many aims: first, to inculcate the correct Islamic faith in students and take care of them through comprehensive Islamic education in their morals, a way of thinking, language and their sense of belonging to the Islam nation: second, to train students to pray and to teach them good ethics and behaviour: third, to develop a number of basic skills, specifically language proficiency, numerical skill

and body exercises: fourth, to provide students with the necessary information in different topics: fifth, to acquaint students with the mercy of God on their lives and on their geographical and social environment so that they use this mercy in serving themselves and their community: sixth, to enhance students' creativity and improve their manual work: seventh, to develop students' understanding of their duties and their rights and to encourage love of their country and loyalty to their rulers: eighth, to fuel students' desire to gain knowledge and practise and educate them to get the most use from their free time: ninth, to prepare students for the second stage of life.

School statistics

In 2015, this school had 544 students enrolled and 42 employees; one teacher was employed as the headteacher, two were assistants of the headteacher, twenty-eight were teachers and four were student advisers, with five administration staff, one secretary working in learning resources and one school gatekeeper. All of these employees were Saudis.

Overview of school

This study was performed in one of the large primary schools in Makkah city. However, access to this public school was difficult for many reasons; firstly, the houses around the school were connected to each other and the streets overlapped; secondly, there were no signs to direct people to the school; and thirdly, there was no school bell in the main gate of the school. The school building was designed by the Ministry of Education as one building, which consists of three floors; however, there was another school sharing the same school building at different times. The school has a large lobby; however, more than half of the school's lobby was covered in a special carpet that was used during Noon prayers at 12:30 pm to 01:00pm. Inside the school lobby, there were many pictures, some of which were made by the students but the majority made by the school office. The air inside the school lobby was hot and the school equipment, such as tables and chairs, was old. The school

consists of many classrooms on each floor, with one room for learning resources used by teachers.

However, the school had no library or laboratories. The school had a large schoolyard which was split into two sections: in the first section, there was furnished playground area, the surface of which was covered to protect students from the direct sun, whereas in the second section, the area was not covered or furnished. The school had a canteen as a separate room located outside the school building; from the outside, the canteen appeared to be in poor condition. It is a room attached to the school wall and it had three windows where students could order food.

School finance

The Ministry of Education pays the salaries of school staff and school bills directly. The school has no direct financial support and the public school's financing is limited. The Ministry of Education gives a yearly limited budget to each school, this budget can be increased from school canteen benefits and any donations. According to MOE (2010) schools have the authority to use the school income and spend it as follows: give 15% to students in need of support, spend 50% on school activities during the semester, use 5% to buy gifts for the school workers, use 10% to buy rewards for outstanding students, use 10% to buy library resources, and send 10% of the school income to the Makkah Ministry of Education.

School contact

The public school chosen in this study had only one landline and there was poor interactions with the families and community through social media because there is no school web site, no Facebook page and no Twitter account.

Summary

The public school is located in a busy area with 544 students and 42 employees. The building was designed for one school; however, there was another school in the building in the afternoon, which caused stress for the staff and students because they were sharing the same place and equipment.

The public school was more popular than the other schools for a variety of reasons; firstly children from many districts are able to attend; secondly, there are no tuition fees; thirdly, there are no conditions for joining the school except for the age requirement. However, there were many problems, such as limited government support, the headteacher making some decisions which restrict the student's movement inside school for example, keeping the school lobby as a mosque instead of leaving it for the students to walk around and do physical exercise. The playground area needing more work in order to make it suitable for students to use for physical exercise.

Case Study 2: Islamic School

Introduction

The second case study is of an Islamic school. It is the third main type of school in Makkah city. The school of interest is located in Makkah, in an area close to business markets; the school is surrounded by many houses.

School System

The Islamic school accepts students at age six, with the youngest being five years and ten months old. The Ministry of Education established a website to accept students to the school from all over the country. They called it Noor Web and the families have to use the Noor government website to apply for school acceptance. This type of school is free of school fees.

The school is under the rules and regulations of the Ministry of Education. Like other Islamic schools in Saudi Arabia, this school adopted the Saudi curriculum when the school was established, so it focuses on Islamic studies and memorising the Holy Quran as well as other sciences. Therefore, there is one physical exercises lesson per week, whereas there are sixteen lessons about Islam, such as Quran, Hadith, Jurisprudence, Tajwid, and Monotheism lessons as shown in table (4.2) below.

Table 4.2: The Islamic school curriculum

	Subject		Number of lessons weekly
1	Arabic language		7
2	Maths		4
3	Science		2
4	Physical exercises		1
5	Arts		1
6	English		2
7	History		2
8	Islamic study		16
	1	Quran	12
	2	Monotheism	1
	3	Tajwid (Rules of Quran recitation)	1
	4	Jurisprudence	1
	5	Hadith (quotes from Prophet lives)	1

What distinguishes this type of school is that the students receive a monthly bonus from the government. Each student enrolled into an Islamic primary school will have a monthly bonus of 250 SR (£60). The Islamic school cannot accept students from different nationalities and it is easy for the students from Islamic schools to transfer to Islamic, public or private schools.

School Aims

According to Education Policy in Saudi Arabia, Islamic primary schools follow the same education policy, standard and aims as public primary schools. However, according to the MOE (2016a) Islamic schools have an additional aim, which is to educate students on how to care for the Holy Quran, appreciate it, recite it, and learn the subjects related to the Holy Quran to achieve the aims of the Saudi education policy.

School statistics

In 2015, this school had 558 students enrolled and 50 employees. One of the teachers was working as the headteacher, two were assistants of the headteacher, thirty-four were teachers and four were student advisers, with one school activity coordinator, six administration staff, one secretary for learning resources, and one school gatekeeper. All of them were of Saudi nationality.

Overview of the school

Access to the Islamic school was more difficult compared to access to other types of schools, there are many reasons for this. Firstly, Islamic schools have limited numbers compared to public schools and secondly, there were no signs to direct people to the school. In order to locate the school I did the following: First, when I was at the Makkah Ministry of Education I asked them to help me draw a map to direct me to the right place. Second, on my way to the school, I contacted the school by telephone for support, and third, I asked many people in the street to direct me to the school. The Islamic school building looked huge from the outside; however, there was nowhere to park a car making it difficult to stop. There was a playground outside the school, but there was no grass or carpet to make it suitable for students to play on.

The Islamic school building consisted of four floors and had been designed to accommodate one school; however, the Ministry of Education integrated two schools within the same building. This affected the Islamic school environment, there was no room for a library, gym or sports hall; it also affected the school's meal time because the canteen was not capable of providing facilities for all three schools at the same time. Therefore, they divided the meal time between three schools and the students had to go down from the fourth floor and exit the building very quickly to buy food and eat it before going back to the classroom. Inside the school, there was a large lobby; however, most of the school lobby was covered with a mosque carpet which was the same as the situation in the public school lobby. However, the difference here is that the carpet was surrounded by a barrier. There were many beautiful pictures in the school lobby made by the school, this included many different messages, such as Islamic values and healthy food education. At the Islamic school, the canteen consisted of just one room, which was attached to the school wall. It had only one window for students to order food.

School finance

The Ministry of Education pays the salaries of school staff, students are rewarded because they study in an Islamic school and school bills are paid directly by the Ministry of Education. The school has no direct financial support, and so the Islamic school's financing is limited. The Ministry of Education gives a yearly limited budget to each school however, this budget can be increased from school canteen benefits and donations. According to MOE (2010) schools have the authority to use the school income and spend it for the school's purposes as follows. 15% is given to students in need as support, 50% is spent on the school activities during the semester, 5% is used to buy a gifts for the school workers, 10% to buys rewards for outstanding students, 10% is used to buy library needs, and 10% of the total school income is sent to Makkah Ministry of Education.

School contact

The Islamic school chosen for this study had one landline and poor interaction with the families and community through social media because there is no school web site, no Facebook page and no Twitter account.

Summary

The Islamic school is located in a very busy area with 558 students and 34 employees. The building was designed for one school; however, there were three schools using it at the same time, this caused stress to the staff and students because there was not enough space and equipment. The Islamic school has many negative aspects such as keeping the school lobby as a mosque instead of keeping it for the students so that they can use it for physical exercise; the playground area needs to be made suitable for students to do physical exercise. However, the Islamic school is distinguished by giving bonuses to its students. It encourages students to keep and memorise the Holy Quran which is highly respected in the Saudi community. Students can easily move from this school to other types of schools.

Case Study 3: Private School

Introduction

The third case study is a private school. The chosen school was established in August 2006, and is owned by a private company. The private school was located close to the famous Makkah highway. It has a wide campus with four big gates. It was not clear how to enter the school because some of these gates had not been in use for a long time, and others were only open at certain times.

School System

The private school accepts children at age six, with the youngest being five years and ten months old. The private school has the authority to use the Noor website to register students instead of their families. The private school is not free of school fees; each private school has its own way of advertising and its own method of accepting students. The school fees for this school are around 12,000 SR (£2,867), which is not high when compared to fees for other private schools and facilities in Makkah. The private school is under the rules and regulations of the Ministry of Education so this school adopted the Saudi curriculum when the school was established. This private school is good with regard to the content of the curriculum. There are four lessons supporting physical activity, with one physical exercise lesson per week, one Taekwondo lesson and one swimming lesson per week. Moreover, there are ten lessons about Islam, such as Quran, Hadith, Jurisprudence, Tajwid, and Monotheism lessons as shown in table (4.3) below.

Table 4.3: The private school curriculum

	Subject		Number of lessons weekly
1	Arabic language		8
2	Maths		7
3	Science		5
4	Computer		1
5	Arts		2
6	English		6
7	History		2
8	Islamic study		10
	1	Quran	4
	2	Monotheism	1
	3	Tajwid (Rules of Quran recitation)	1
	4	Jurisprudence	2
	5	Hadith (Quotes from Prophet lives)	2

9	Physical exercises	2
10	Taekwondo	1
11	Swimming	1

However, the school is allowed to add additional sessions to the curriculum. The majority of the students come from wealthy families or middle class families who can afford to pay their children's fees. The private school can accept students from different nationalities and it is easy for students from private schools to transfer to another private or public school, except Islamic schools where they would be required to fulfil the Islamic school standard.

School Aims

According to the Education Policy in Saudi Arabia, the private primary school followed the same education policy, standard and aims as public primary schools. However, private schools can add to the aims and standards as they see necessary, so some private schools add more specific aims. For example, Learning Private School in Riyadh city has added many aims such as acquiring self-learning among students using new techniques and encouraging students to appreciate the importance of time and exploiting it wisely (LCET, 2014).

School statistics

In 2015, this school had 779 students enrolled and 79 employees; one teacher was working as the headteacher and one supervision teacher from the Makkah Ministry of Education, with two assistants of the headteacher, a teachers development department, a school laboratories team, sports and workshops. The majority of them were non-Saudis.

Overview of school

The private school consists of three floors, all of which have stairs; in addition, there are modern lifts. The private schools were very distinguished with regard to school facilities and

there was evidence that money had been spent improving the school environment. For example, the private school has workshops such as engineering and electricity, with good material supplies and qualified teachers. Secondly, the private school provides a supportive learning environment such as a large school library. It is a separate building within the school campus and contains many laboratories, such as the biology laboratory. Thirdly, the private school has good outdoor and indoor facilities. The private school pays particular attention to indoor playgrounds. There is a separate building for the gym which contains a large swimming pool and an area for playing football. Outside the school there is a big open stadium with good facilities and two play areas. The two play areas have carpet on their floors to protect the students when they play, and the surface is covered to protect the students from sunlight.

The private school has kept open access to all of these facilities even after school time. The last good facility at the private school is the canteen building. It was located not far away from the primary school, less than a two-minute walk for the students. The school had a covered path to make the walk to the canteen comfortable for the students in varying weather conditions. The private school canteen consists of a big hall with many tables and chairs. The canteen distinguishes the presentation of the food and the uniform of the employee.

School finance

The Ministry of Education provides direct financial support to the schools owner, so the private school finance is good. The source of income includes government support, school fees, school canteen benefits, canteen contracts, canteen penalties and donations. However, the main school income comes from school fees and the canteen.

School contact

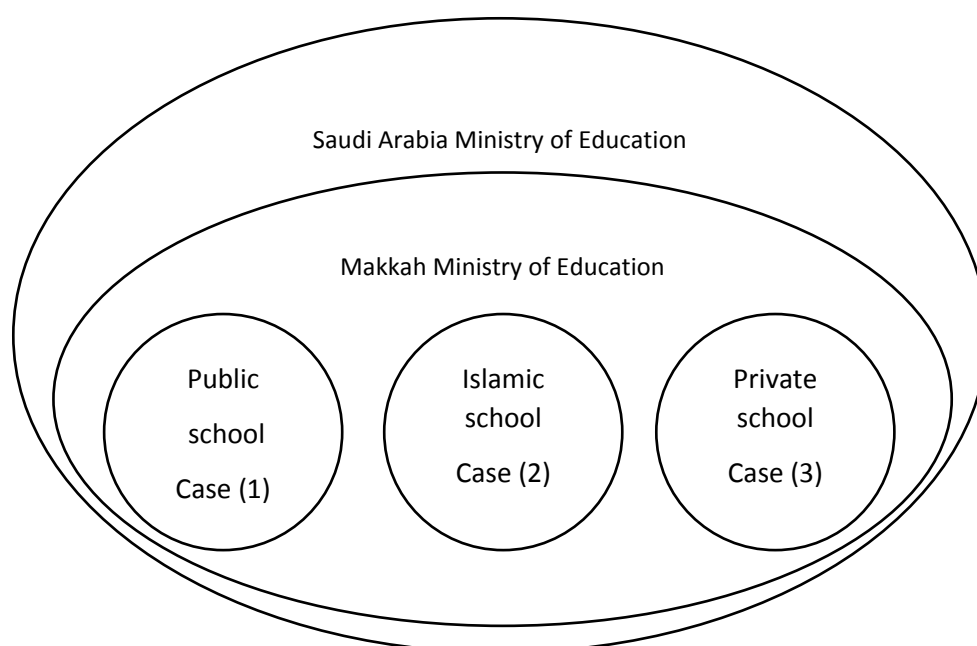
The private school chosen in this study has many landlines and has a good interaction with the families and community through social media; the school has a web site, a Facebook page and a Twitter account.

Summary

The private school is located outside the crowded area that is close to the Makkah highway. The school has 779 students and 79 employees. The private school has many distinguishing features; for example, the school has good indoor and outdoor facilities such as a swimming pool and sports area. In addition, the students in the private school can use these facilities even outside school hours. However, there were small problems such as school fees and the limited capacity of the school.

Conclusion

This study was conducted in Makkah, Saudi Arabia and focused on three types of schools as three cases; one public school; one Islamic school; one private school.



There are many similarities between the three types of school such as using the Noor government website for enrolment. However, there were many differences between the schools such as; school facilities and government support to the students. More detail about the similarities and differences are shown in the table (4.4).

Table 4.4: the similarities and differences between schools

	Public school	Islamic school	Private school
Number of Students	544	558	779
Number of Employees	42	50	79
Buildings were designed for school use	Yes	Yes	Yes
School mission and vision	NO	NO	Yes
School facilities	Very limited	Very limited	Multiple
School fees	NO	NO	Yes
Students' government bonus	NO	Yes	NO
Social media interactions	NO	NO	Yes
Transfer from school to another	Yes	Conditional	Yes
School Curriculum	Standard	Standard	Modification
Use Noor government website	Yes by parents	Yes by parents	Yes by school
Number of schools in the same building	One morning One afternoon	Three schools at the same time	One school

The purpose of this chapter was to understand the large social and organisational context within which all three cases are situated. This chapter included two stages. The brief description of Makkah and the Ministry of Education was followed by the second stage, the in-depth information on each case separately, starting with the public school, followed by the Islamic school, and ending with the private school.

CHAPTER FIVE: SCHOOL SYSTEM AND

PHILOSOPHY

Introduction:

This chapter discusses the data analysis of the three types of school in Saudi Arabia. The data were generated from different sources, these include observation, interviewing teachers and students, and documents. The data analysis process was thematic using inductive techniques on three levels. The first level was analysing data as separate units so that each unit reveals its findings. The second level is to integrate similar units into one group to represent the findings of those units. The third level is to integrate all groups in to one to represent the final findings of the school. There are many ways to conduct data analysis. According to Maxwell (2013) there is no single correct way for doing analysis. However, I found that the thematic analysis by Braun and Clarke (2006) was the most appropriate and widely used form of analysis so I decided to use it as a framework for the data analysis in this study. After looking at the findings of all the methods, observations, teacher interviews, student interviews and documents, my supervisors and I discussed the findings. The final findings after integrating all schools together shows four themes to be major factors that may affect children's body weight in the Saudi school. These are as follows: school system and philosophy; physical environment; students' health behaviour and outside factors that affect students' health. The next section will analyse school system and philosophy across all schools and other themes will be discussed in separate chapters.

Theme 1: SCHOOL SYSTEM AND PHILOSOPHY

The data analysis shows many important points about the private, public, and Islamic school system and philosophy. Four themes are presented describing the school system and

philosophy. These are the teacher's role, the school canteen, the school programmes and the role of the Ministry of Education. This includes five sub themes, which are school capacity, curriculum, health, timetable and the role of the headteacher. Each theme includes evidence such as field notes, teacher interviews and student interviews to clarify it.

Theme 1: Sub-theme 1: The teacher's role

The majority of data in this sub theme was sourced from the teachers' interviews; however, there is supportive data from the observation and students' interviews. Teachers play an important role in improving students' health awareness and there were positive and negative comments. Many teachers in the private school mentioned their role in health education. For example, they mentioned that when the teacher is covering health topic in the classroom they can lead the discussion about the importance of body weight. As an example, the Arabic language lesson has one topic about the risks of eating too much food. During this lesson teachers can talk about obesity and maintaining body weight, as quoted below.

"We teach the Arabic language and we have one topic about excessive food intake and the teacher can connect this topic with body weight"

(PT2. Teacher Interview, Private school)

Also, during observation I saw the commitment of the sports teacher in the private school. The teacher, with the students, continues doing other physical exercises, instead of playing football only, as in the note below:

"I saw the sports teacher with his students doing some physical exercise. Some of the students asked him to stop and play football, but he was committed to finishing the physical exercise."

(Field notes, Private School)

One participant mentioned the importance of the teachers' role in guiding the students to better health through his advice to them. Some students ask the teacher's advice about healthy food and some types of food in relation to body weight, as in the extract from the quote below.

"Regarding body weight, some of the students come and ask me how they can lose weight or sometimes they ask me about a certain food and if it does have an impact on increasing or decreasing their body weight and I am of course answering their questions."

(PT3. Teacher Interview, Private school)

Three participants said that the level of motivation and taking responsibility by teachers in the public school is high. Therefore, they care about students' health and it seems that there is motivation from the teachers but they engage with the students informally, as quoted below.

"We have limited health lectures in our school. We do have strong personal motivations in regard to students' health and we presented lectures. In particular, the teachers work as directors of the school activities or as each student's advisor."

(BT6. Teacher Interview, Public school)

BT1: In this school, teachers have inside motivation to care for students' health. I noticed them in the early morning advising students to eat healthy food, asking them to bring food from home and not to buy it from here.

Ahmed: Can you tell me more?

BT1: They believe that the breakfast brought from home is healthier than foods available from the school. However, this action from teachers is due to personal motivation and it is not organised or derived from school instructions.

(BT1. Teacher Interview, Public school)

AT1: We, as sports teachers, have a big responsibility in regard to students' body weight. We should implement a plan to prevent students from suffering from obesity and treat those who suffer from it. But unfortunately the current situation is that the teachers focus on football and simple physical exercise.

(AT1. Teacher Interview, Public school)

Teachers in the public school recognised the problem of students being overweight and saw it from different perspectives. For example, one teacher recognised the problem because he had noticed obesity among his own family, so he did not want to see the students suffering too, as quoted below.

Ahmed: Can you tell me more?

AT2: I observed in my family that we are suffering from obesity. It is difficult to see one member suffer a lot when he walks for a small distance. Here in the school, I noticed that many students are suffering from obesity. These students are facing difficulty when walking and using car and cannot go out of their homes to enjoy their lives. If they continue with the same body weight they will suffer a lot in the future.

(AT2. Teacher Interview, Public school)

Other teachers in the public school considered body weight to be a problem for students. One teacher mentioned that there are many overweight students and the second one mentioned that 30% of the students are obese, as quoted below.

“Regarding students’ health in the school I noticed that some are obese. Around 20-30% of the students at this public school are obese, which has been especially seen in recent years. In the last five years I have started to observe that many students are suffering from obesity and from infectious diseases.”

(BT2. Teacher Interview, Public school)

In the Islamic school the situation is not better than in the other two schools. In the Islamic school there is no teacher development programme and no facility to help teachers in their teaching. The clear message coming from Islamic teachers is that they are very busy this may be due to a shortage of school staff. All these factors affect the teachers’ productivity; teachers are very busy with the basics of the school curriculum and have no time to observe students’ health or educate them about health issues. For example, in the Islamic school I saw the headteacher covering teachers’ lessons, as quoted below.

“I noticed that all teachers are very busy giving their lessons in the classrooms and covering other teachers’ lessons in the classroom. I did not observe teachers sitting in the teachers’ room as I saw in the public and private schools. When I came to the school the headteacher was not in his office, so I asked one teacher and he asked me to wait for him, until you hear the school bell, then he will come back to his office because I am sure that he is covering one teacher in one of those classrooms right now.”

(Field notes, Islamic School)

Two participants mentioned the importance of the student advisor at the school, he is employed to cover any health issues arising with students. The student advisor takes responsibility for the students' health at school. He and another participant mentioned many important points relating to the student advisor's role in trying to help the students maintain a healthy body weight. Starting to practise healthy behaviours at an early age is easier than changing unhealthy behaviour later, as quoted below.

"The students' advisor should start health prevention programmes to keep the students' bodies as healthy as possible. I want to focus on the student advisor's role because he can lead the students to be healthy, buy good quality and healthy food in the school canteen, and also do physical activities. It is very important to start prevention programmes in primary school because their age is suitable to give them awareness and prevention programmes before they practise bad behaviour. For example, he can educate them about obesity before they become obese."

(I2T2. Teacher Interview, Islamic school)

BT6: The students from grades one to three are suitable to participate in any activities. They have a good level of interaction. This is unlike the students from grade five and six, who show low interactive levels with the teachers. Therefore, I recommend starting to change any behaviour from the low grades onwards and going gradually to the upper levels.

Ahmed: could you explain that to me?

BT6: The younger students are very good in following the teacher's instructions.

(BT6. Teacher Interview, Public school)

Across all types of schools there are many barriers which affect teachers' responsibilities to care about students' health. The first barrier is the diversity of teachers' responsibilities, such as teaching, supervision and the huge number of students in each classroom, as quoted below.

BT6: We have no time to talk about students' body weight, because we are very busy, giving twenty-four lessons a week. Also, we have supervisions in the morning, at breakfast time and some of us also do afternoon supervision. More than that, we have more than forty students and sometimes more inside each classroom.

Ahmed: Forty?

BT6: Yes, because they have started closing some schools in the area and distributing students into the nearest schools.

(BT6. Teacher Interview, Public school)

Absence of a teamwork health plan from the Ministry of Education can affect teachers' roles. Three teachers mentioned that there was a demand to work as a group to deal with health issues because it is important to achieve success. Group work should include many different people such as teachers, families and private sectors, as quoted below.

AT2: I get frustrated, as a teacher of science, as I cannot do many things alone. I teach them in the classroom about healthy body weight and food. Also, when I notice them in the early morning eating unhealthy food I try to educate them about the effect of that food on their health. However, this health behaviour will continue, because alone I cannot control a whole situation.

Ahmed: Do you let them eat that food?

AT2: No, we take it away from them, but we return to them by the end of that day except for the soft drinks.

(AT2. Teacher Interview, Public school)

"The roles of home and school are complementary to each other. Failure of one of them means failure of the other. For example, when a student wants to start a diet without encouragement from home and school he will find he cannot continue."

(P2T3. Teacher Interview, Private school)

AT1: We have a strong demand to treat obesity and we cannot stop increasing its prevalence unless we implement sports clubs. The problem with the current sport clubs is that their aim is focusing on teaching children Taekwondo and boxing.

Ahmed: Oh!

AT1: There are no government sport clubs. Everything we have is private, and guess what?

Ahmed: What?

AT1: They have become places where children make new friends. But they do not swim or do other activities.

(AT1. Teacher Interview, Public school)

Many teachers understand that the schools have a strong role and are responsible for regulations in the school canteen but the role is limited to the headteachers jurisdiction. However, in the private school one teacher took responsibility and discussed school canteen issues with the school's headteacher, as a result the headteacher agreed to change some types of food in the school canteen. None of the teachers from the public or Islamic schools

discussed the school's canteen food with headteachers because they believed that headteachers understood their roles and would not need reminding of them, as in the quote below.

BT3: There is another problem. The school delegated the canteen to the contractor and is very poor in terms of observing them and ensuring that the contractor is following the right rules. For example, where they keep the food. Is it fresh food in the canteen?

Ahmed: You mean inside the school?

BT3: I mean why does the headteacher stop his role when he signs the contract!

Ahmed: Is that in the contract, I mean they have no power to evaluate them?

BT3: No, they have but they do not care, they are happy with the income only.

Ahmed: You mean that it depends on the contractor's honesty?

BT3: Yes. The contractor may keep the food in an unsuitable place, or may use the food from the day before and warm it up and sell it to the students, because the contractor deals with the canteen as a business and cares only about how much money he will earn.

Ahmed: Do you have another example?

BT3: Yes, for example he is not concerned about healthy behaviours such as gloves and hygiene.

(BT3. Teacher Interview, Public school)

There is a lack of guidance from sports teachers during students' physical sessions. Teachers from the public and Islamic schools mentioned that sports teachers need to take an active role in physical exercise lessons at the school and encourage students to participate in physical exercise, they should not be satisfied when students wear sports uniforms only during sport sessions and opt out of physical exercise lessons as a group, as quoted below.

"Some physical education teachers do not encourage all students to participate in the physical lessons. I think some teachers were satisfied when they saw all of the students wear the sports dress at the time of physical lessons. Some students stayed in their classroom whereas their peers were playing in the playground. In each classroom sometimes, you can see three to four students sitting and talking. I do not know! Is that because they feel shame about the sports dress or because the teacher did not care about the students who do not want to participate in his lessons?"

(I3T2. Teacher Interview, Islamic school)

Teachers from all types of schools commented that there is a lack of family awareness about healthy food for their children. Few teachers commented on the responsibility of the parents regarding their child's meal choices in the school canteen or the lack of healthy choices provided by the canteen. Therefore, many teachers mentioned the importance of families' awareness about healthy food and maintaining a good connection between the school and parents. Few teachers mentioned a need for teachers' efforts to improve the family awareness, as the quote below.

"We need to start with the family at home to increase their awareness. I need to warn the family that their son should eat specific and carefully selected meals."

(PT1. Teacher Interview, Private school)

A few teachers mentioned the need to consider different ways of maintaining students' healthy body weight. For example, using exercises for body weight control, because exercise can be done as individual and group activities inside or outside the school. Moreover, children love sports and they like to participate rather than control their food, as quoted from the teacher's interview below.

"It seems difficult to force students to eat certain foods. However, children love sports and we can ask them to participate in exercises and build a good healthy environment not only inside school but also outside school."

(P2T3. Teacher Interview, Private school)

"We go to a sport club and the coach guides us and we train together."

(Students Interview, Private school)

Some teachers from Islamic and public schools advise teachers to increase their health awareness and knowledge so they can understand how to guide students to maintain healthy body weight, as quoted below.

AT1: Unfortunately, sports teachers need to be educated about the importance of their role in maintaining students' body weight. If this is done they can also teach parents about how they can support their children to maintain regular physical activities.

Ahmed: Humm

AT1: The teachers do not have enough knowledge to deal with the obesity or other health issues from their university.

(AT1. Teacher Interview, Public school)

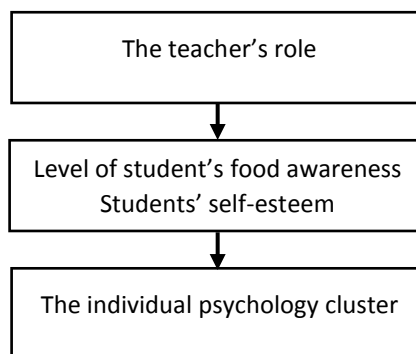
The school needs to increase its staff and nominate a new position for student advisor at the school to cover the health issues among students, as quoted below.

“The first one who should know the students’ health situation in the school is the student advisor. He is aware of all health problems of the students at the Islamic school, because the teachers were very busy with many things and besides that they have limited backgrounds on disease and health issues.”

(IT1. Teacher Interview, Islamic school)

Summary

The teacher’s role is one of the factors that may affect children’s body weight. Teachers from the private school understood their role in regard to students’ health education. Their school was supportive to them by improving their skills and knowledge through courses from the private school development department which was very active. While the teachers in the public school had a small department for developing teacher skills, they were doing health promotion for the students as they felt they had a responsibility to interact with students on health issues. There was no department for the development of teacher skills in the Islamic school and the teachers were very busy and were not concerned for the students’ health. This may be due to the shortage of staff and teachers and heavy workloads in the Islamic school. The teacher’s role can have an impact on one cluster of the Foresight Obesity System Map, which is individual psychology cluster. For example, a teacher’s role can affect the level of students’ food awareness and students’ self-esteem and that is related to the individual psychology cluster, as shown in the diagram below.



There are many barriers to involving the teachers in students' health along with other barriers in schools. Teachers from all types of schools mentioned that they need a student health plan involving teachers, students, families and friends to work as a team to improve students' body weight. They mentioned that the workload is affecting their role regarding concern for students' health. They were also concerned that a lack of family and teachers' awareness regarding student health affects their role in controlling students' healthy body weight.

Teachers from the Islamic school mentioned that shortages of staff and the large number of students in the school has an impact on their role in students' health. The teachers' role in the Islamic and in the public school canteen is very limited and they blame the headteacher and families for selling unhealthy food in the school canteen.

Teachers' recommendations were as follows, schools should reduce the barriers mentioned above, focus on student sports and nominate staff to focus on students' health and work as a team to control healthy food and healthy body weight.

Theme 1: Sub-theme 2: School canteen

In all types of schools, the canteen food was classified into two types. The first type is food that has been prepared by the food industry and which has a long shelf life. The second type of food was prepared by the contractor of the canteen, and this type of food should be used on the same day. The types of food inside the public and the Islamic school canteens were

limited. The majority of foodstuffs were biscuits, biscuits with chocolate, and cheese sandwiches, at the public and the Islamic school canteen, eating containers in the canteen were placed near each other, so it was difficult for the students to recognise all the food available, as quoted below.

"In this canteen, I saw long-term juices, different types of chocolates and biscuits with chocolates, sweets, sandwiches, fried chips, water, no soft drinks. However, I saw many empty cans outside the school door."

(Field notes, Public School)

I noticed that the quality of food in the Islamic and public school canteens was low and there was a limited choice of food. Also, most of the food in the private school canteen was not suitable for the students' needs, as a teacher said in the quote below.

"In the school canteen there are some types of cheese sandwiches. It is a healthy food, no problem. However, the problem is that it is not a comprehensive meal. The children in this age group are supposed to be offered a full meal."

(P2T1. Teacher Interview, Private school)

What was remarkable was that there was no fruit available at the school canteens. However, the majority of participants in this study chose eating fruit when I asked them how to maintain a healthy body weight.

"Eat fruit, do sports and physical exercises"

"Eat fruit, avoid overeating and eat little meal"

"Eat fruit, vegetables and regular food, do exercises"

"Eat vegetables and fruit, eat balanced and do sports"

(Students interviews, Islamic School)

The Ministry of Education plays a significant role in the school canteen system. One participant mentioned that he had struggled with the school canteen system. One company was authorised by the Ministry of Education to supply Islamic and public schools in the city. However, the contract changed from one exclusive food company to a number of different companies, which improved the situation. For example, distributing food to many schools using one company is time consuming and if it is transported in cars which are not designed for food transfer, it is possible that the food may be exposed to high temperatures, as quoted below.

BT6: Before, the Ministry of Education signed a contract with one food company to supply the school canteen. This caused many difficulties, such as, the breakfasts coming late to the school because of the crowded areas. So they stopped and gave the authority to the school to sign with a local provider.

(BT6. Teacher Interview, Public school)

The new regulations from the Ministry of Education are not now involved directly with the school canteen but they authorise headteachers to implement the school canteen standards and regulations within the school. Every semester each school must provide the Ministry of Education with a copy of the school canteen contract and the approved percentage of the schools' canteen income, except in the private school, because it has responsibility for the school canteen contract. However, participants from all types of schools mentioned that the school aim is to gain more money from the school canteen. Therefore, they promote the sale of food that the students like regardless of the quality of the food in order to increase the school income, as quoted from the interview below.

“The school canteen provides what the students like to eat, because when the school provides healthy food, the students will not buy it. In fact, the school is concerned about the high income from the school canteen.”

(I3T2. Teacher Interview, Islamic school)

“Let's be realistic. You cannot fully control the situation. Because in the end, the sponsor needs money and he does not want to completely lose. This is supposed to be as much as possible to have healthy food and we can modify it with him.”

(P2T2. Teacher Interview, Private school)

The school canteen provides the source of income for headteachers, if the contractor is not satisfied with the income they will not renew the contract with the school. When the contractor takes this action, the school will face difficulties in finding another contractor because profit is seen as more important than quality from an administration perspective. Therefore, the school administration tries not to focus on food quality in order to maintain the canteen's income and retain school activities such as the school closing ceremony for the academic year. The contractor will bring in food that makes the most profit and will not focus on healthy food, as quoted below.

BT6: You know what! The school canteen is a business. They rent it to someone, he may be a teacher and the teacher may rent it to somebody else.

Ahmed: Really?

BT6: Sometimes they rent it to a teacher and sometimes it goes outside. I remember when I worked in a school, one day I was on afternoon

supervision and I decided to close the school canteen so the students would go outside because it was the end of the school day, but somebody informed the headteacher. Then the headteacher came and asked me not to close the school canteen. He repeated that 'our profit' many times.

Ahmed: What did you think?

BT6: He said "You want to stop our income! This is our profit. All programmes will pay if you close the school canteen."

Ahmed: Ok.

BT6: Let's say that the rent of the school canteen is 56,000 SR yearly, so if you put many obstacles in place of this income by the end of the year the contractor will give them two options. The first one is to reduce the rent, or, secondly, remove these kinds of obstacles otherwise he will not renew the contract. So the headteacher wants to keep the budget as it is and keep away rent problems.

BT6: The administration focuses on the income from the school canteen.

Ahmed: You mean money?

BRT6: Yes, the first priority is the income. The headteacher said we open the school canteen to get more money and if we have many obstacles we will be the first ones who lose. So he wants to provide breakfast to the students and gain more money to cover the school activities

(BT6. Teacher Interview, Public school)

BT3: Sandwiches in the school canteen represent what the community is eating.

Ahmed: Ah

BT3: So the contractor will bring in what the community likes. He will not pay attention to healthy or unhealthy food.

Ahmed: Do you have an example?

BT3: For example, you will never ever find any kinds of fruit in the school canteen.

Ahmed: From your perspective, why is that?

BT3: I think the students will not buy it. However, the contractor does not try to sell it.

Ahmed: Ah.

BT3: I think if the contractor tries to sell fruit, the students will buy it.

The school canteen has only sandwiches, juice and chips.

(BT3. Teacher Interview, Public school)

Two participants mentioned that some school headteachers and administrators take action to maximise school canteen income. For example, they try to prevent students bringing their own food to the school in order to force them to buy from the school canteen, even if their food is better than the school canteen food. Another example, is to keep the teachers away from the school canteen so they will not affect its income, as quoted below.

BT6: The school administration does not interfere with teachers in health education, eating or anything related to the school canteen and income.

Ahmed: What do you mean?

BT6: I meant that they will not ask you directly not to give lectures about health but will say there is not enough time to do it and there is no national activity to do so. However, we have lectures about health but they are very limited.

(BT6. Teacher Interview, Public school)

BT3: Some school administrations do not allow the students to bring their own food.

Ahmed: Do these students bring good food from their homes?

BT3: The food that the students bring is better than what the school canteen is providing, even the cheese sandwiches. Imagine that there is no apples, no orange juice in the school canteen.

Ahmed: Do you think the students will buy fruit?

BT3: Yes, why not, if they eat fruit at home, what is the barrier to eating it at school? But there you are providing them with what they like such as French fries, and you do not ask them to eat fruit.

(BT3. Teacher Interview, Public school)

The majority of the teachers were unhappy with the quality and quantity of canteen food, even at the private school. For example, the private school canteen included drinks that were not fresh and were very sweet, as quoted below.

“The school canteen offers sweets which contain artificial colours and artificial flavours and this is a problem; however, we are trying to follow up with the school canteen.”

Teachers understand that the school canteen is not their responsibility, it is the headteacher's responsibility and they cannot change the current situation. They know that there is a lack of continuing evaluation and supervision of the school canteen from the school administration, and they know that with lack of evaluation, the contractor may engage in unhealthy practices with regard to food quality which in turn may affect students' health and their appetite. For example, it is unknown how long the contractor uses the same oil to cook fried chips. So there is no ongoing monitoring of the quality or content of what is served from the canteen. Therefore, the contractor puts profit above food quality. The majority of the teachers direct the responsibilities to the headteachers, as quoted below.

BT3: There is another problem. The school delegated the canteen to the contractor and is very poor in terms of observing them and ensuring that the contractor is following the right rules. For example, where they keep the food. Is it fresh food in the canteen?

Ahmed: You mean inside the school?

BT3: I mean why does the headteacher stop his role when he signs the contract!

Ahmed: Is that in the contract, I mean they have no power to evaluate them?

BT3: No, they have but they do not care, they are happy with the income only.

Ahmed: You mean that it depends on the contractor's honesty?

BT3: Yes. The contractor may keep the food in an unsuitable place, or may use the food from the day before and warm it up and sell it to the

students, because the contractor deals with the canteen as a business and cares only about how much money he will earn.

Ahmed: Do you have another example?

BT3: Yes, for example he is not concerned about healthy behaviours such as gloves and hygiene.

(BT3. Teacher Interview, Public school)

BT1: The school canteen has no supervision from the school. Thus, if I will evaluate them I will give them 2 points out of 10. I think if we have good supervision, we will have a good quality. But the administration signed the contract and they leave it to the contractor without evaluation.

Ahmed: Is the food suitable for the children?

BT1: No, from my perspective the food available in the school canteen is not diverse.

Ahmed: Can you explain more?

BT1: I believe that 70% to 80% of the food in school canteen is not suitable and is unhealthy.

Ahmed: You mean that the contractor does not follow the Ministry of Education's instructions?

BT1: Yes, the contractor does not follow many rule, such as; health instructions, cleaning, workers and food diversity, as I mentioned before.

(BT1. Teacher Interview, Public school)

In support of the above statement, when I noticed some negative issues in the Islamic school canteen, I talked to one teacher about them but it seemed that the teachers had no control over the school canteen, as quoted below.

"I saw many things, and when I sat with one teacher I asked him about that and he said 'We have no responsibility for the school canteen. In addition to that, all teachers, headteacher and parents know the situation and they accept it', and when I asked him how he knew that all were accepting that situation, he referred to that by saying 'We haven't received any complaints from them'."

(Field notes, Islamic School)

However, one participant mentioned that it is difficult to control the school canteen because it takes significant effort to change. The participant described how the school manager took action when he mentioned that the quality of the food in the school canteen was not appropriate for students, as quoted below.

"One year ago, I talked to the headteacher; I told him that some of the food in the school canteen is inappropriate for the students. Thank God he responded and after that some foods were changed. Now we have no mayonnaise, no tomato in the sandwich."

(PT3. Teacher Interview, Private school)

One participant mentioned a reason for the poor quality of school canteen food, he commented that some of the contractors have a lack of knowledge about healthy food so they provide the school with inappropriate food, as quoted from the interview below.

“Those who are considered as a food resource for students should be aware of healthy food. Because the aim is not only to provide food to feed the hungry students!”

(PT1. Teacher Interview, Private school)

The above quote focuses on education as one solution. Some teachers who participated in the study called for contractors to be educated about the importance of food in a children’s growth and wellbeing, this should be done before they take over and sign the contract with the school canteen.

One participant from the private school recommended another solution which was that the school should have a nutritional specialist working with the school, the specialist would evaluate and follow up on the food quality in the school canteen to ensure that it provides healthy food and that the contractor is committed to applying the terms of the contract. Moreover, one participant from the Islamic school recommended signing a contract with national, specialised food companies to reach a high quality of food, as quoted below.

“I hope that my message will reach the decision makers in general and those who care about the schools’ canteens to give the canteens to food companies. So we ensure that the food will be suitable according to the students’ ages. The food companies will focus on the students’ health needs and their body development.”

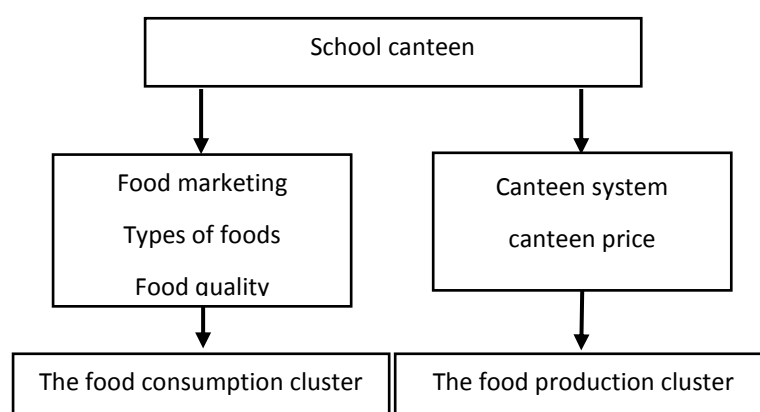
(I2T2. Teacher Interview, Islamic school)

Another participant suggested conducting a study to evaluate the quality of the food and to ensure that the students in the school received good-quality food.

“The quality of food that is provided for students needs to be studied, because the students at this age may not choose a healthy food.”

Summary

The school canteen is the second sub-theme of the school system and philosophy. In all types of school the canteens offer healthy and unhealthy food. For example, no canteen in any type of school is selling fruit to students and the canteens offer many sweets and drinks containing artificial colouring. In the private school, the canteen is not the only source of school income and the owner and headteachers have the power to make changes. In the public and Islamic schools it is clear that the Ministry of Education and headteachers have responsibility for school canteens but instigating change is a lengthy process between the school and the Ministry of Education. The significant problem here is the fact that the school canteen is an important source of school income, as a consequence when food quality is low it results in an increase in the school income. Therefore, school canteens can have an impact on two clusters of the Foresight Obesity System Map, which is the food consumption cluster, and food production cluster. For example, the types and the quality of food in a school canteen is related to the food consumption cluster, as shown in the diagram below.



Headteachers in the Islamic and private schools have great power over the choice of contractors for school canteens by continued evaluation of food quality to ensure that students have healthy food. However, there are many issues of concern, and headteachers accept the low quality of food because they want to sustain the level of income from the

school canteen. Therefore, one of the recommendations from teachers is that headteachers should prepare many alternative solutions in case contractors decide to cancel the canteen contract.

The important point is that teachers from the public school recognise that the students suffer because of food quality and the teachers from the Islamic school were unhappy with the situation because they can do nothing to change it, the students' parents do not seem to be concerned about the quality of school canteen food. One teacher mentioned the difference between what was officially written in the school canteen guidelines from the Ministry of Education and what the school practised. Teachers from the private school believe that changes to the canteen situation need an integrated effort. Therefore, they recommended two things: educating contractors about the healthy food needed for the students' age group and employing specialist nutritionists to work in the school.

Theme 1: Sub-theme 3: School programmes

Schools are involved in many different national and international programmes and the majority of these programmes are implemented by the high authorities. Some of these programmes focus on students' behaviour and healthy eating. During observation I noticed three national programmes; The Feena Khair programme, Mohoben Students' programme, and the Dates and Milk Day programme.

The Dates and Milk Day programme is provided by the Ministry of Education in Saudi Arabia to encourage students in primary schools to improve their dietary habits. Dates and Milk was a valuable project supported by the Ministry of Education in Saudi Arabia. The aim of this project is to encourage children to drink milk and eat dates, not only in the children's own homes or just for children, but students should drink milk in school. It is also to change the misconception that drinking milk is only for children. From the beginning of this project, the

Ministry of Education sent dates and milk to all primary schools in the country. However, three years later this project ceased.

The Mohebah programme is a project supported by King Abdulaziz and His Companions Foundation for Giftedness and Creativity (KAHCFGFC); it is a national cultural foundation. The main aims of this project are to identify talented students in the Kingdom of Saudi Arabia, to develop programmes and offer many services and to increase the level of awareness of the Saudi community about talent, creativity and innovation. KAHCFGFC offers programmes and initiatives such as choosing talented students “Mohob”, partnerships with schools, and local and international enrichment programmes. KAHCFGFC can enter the school in two ways. The first way is as Mohob students and the second way is as a Mohoben School. Many teachers explained the importance of this programme in changing the students' thinking and improving behaviour because this programme motivates the students to read more in fields such as health issues and science. So this programme increases students' health awareness and make it easier for the teachers to deliver their daily subjects.

The Feena Khair programme aimed to encourage more good behaviour. This project was established by the Ministry of Education under the vision, “My school is my responsibility”. The aim of this project was to increase teachers commitment and responsibility, encouraging the school to improve the positive values of the students, such as respect, teamwork and care for the school environment. This project involved five steps, summed up in five words “select, order, clean, prove and keep”. Select refers to classroom tools, to select the useful tools and remove the useless tools from the classroom. Order means that everything should be in its place to create an organised classroom. Clean means to remove the waste and dust from the classroom to maintain a healthy environment. Prove refers to a good follow-up process and to find solutions to any new problems. Keep means to maintain what has been achieved in the previous steps. This programme motivates students to stop practising

unacceptable behaviour and to increase their good behaviours using continued supervision during school time by teachers and selective students. For example, guiding students to healthy behaviour during breakfast time. This type of programme encourages students to improve their health behaviours and this increases their chance of being chosen to work with the selective student committee as a reward to them.

However, not all these programmes are very active in schools. For example, the Ministry of Education stopped supporting the Dates and Milk day programme financially. Therefore, the public and the Islamic schools terminated this programme, the private school administration decided to continue with this programme because of the health benefits to the students.

During observation I noticed that some of these programmes still exist in the schools. For example, the Feena Khair programme. I found the programme logo on the public school wall. While I was at the private school I observed the logo of the Feena Khair programme inside the school and I noticed the Feena Khair programme logo on the main gate of the Islamic school. Each school programme has its goals and aims. For example, some of the Feena Khair programme aims are to increase students' healthy environment, as quoted below.

"We have the Feena Khair programme at our school. You may have heard or seen the activities about this national programme. In general, the aim of this programme is to have a healthy environment. As you know, the healthy environment is a gate to our health. If you visit the classroom you will notice the changes"

(P2T1. Teacher Interview, Private school)

"When I arrived at the Islamic school I saw big signs which reflect the component of the Feena Khair programme on the school gate. This picture had five words "select, order, clean, prove and keep" However, I noticed the logo for fast food existed inside this picture."

(Field notes, Islamic School)

"Before I entered the public school, I noticed that the Fena Khair programme's logo on the school wall."

(Field notes, Public School)

These types of school programmes are a good way to encourage students to improve their behaviour in order to achieve a better situation. For example, it is great when teachers support students to change to healthy behaviour, as quoted below.

"In the first and second school terms, the Ministry of Education decided to choose two days to make the Milk and Dates day. They distributed the milk and dates to the students to encourage them to eat healthy food. However, I recommend this event to all primary school grades."

(I3T2. Teacher Interview, Islamic school)

"I saw a small bag and inside that bag were a few dates and one small bottle of milk. The teacher said this is a good event to encourage children to eat healthy food"

(Field notes, Private School)

These programmes are also a good way to motivate students to improve their knowledge. For example, teachers referred to the Mohoben programme, they said that it motivated students to gain more knowledge and that improves awareness in different aspects of the students' lives, as quoted below.

"If I explained to the students about healthy food they will understand especially Mohoben. In the school, we have Mohoben, their information and mentality is high. Thank God, it is possible to give them an introduction to any topic, and they will give you more than you expect."

(P2T1. Teacher Interview, Private school)

"The teacher said 'and I hope that all students are Mohoben because we feel relaxed with Mohoben, we saw them interested in their studies progressing, and we saw their concern to keep up a good appearance'"

(Field notes, Private School)

"While I was walking during breakfast time, I saw a few students wearing special dress and the Feena Khair logo on their backs. I continued to observe them. I saw they were proud of their work; they started guiding the students to the right food behaviour, helping the students to eat their food in a good and safe environment, asking some students to be quiet and educating students to keep a healthy environment."

(Field notes, Islamic School)

Moreover, these types of school programmes led to many positive points not only for students but also for schools. For example, hearing the voice of competition between schools and the competitions increasing schools' performance to improve students' health, knowledge and behaviour, as quoted below.

"The teacher said, 'we are proud of Mohoben, and we glory in the numbers of Mohoben at the school compared to other schools'"

(Field notes, Private School)

However, school programmes face many barriers which may prevent these programmes from achieving their goals. The first barrier is that programmes are limited in number and some programmes depend on self-motivation of teachers, as quoted below.

“For the Dates and Milk programme, the students bring dates and milk with them and for those who don’t have them then the school will provide them with it. This is a good health programme but only once a year!”

(P2T1. Teacher Interview, Private school)

BT2: We have a few health programmes, such as on international diabetes day, some diseases. They organise events by calling medical doctors to come and talk about a disease. However, these events are limited in number.

Ahmed: Why?

BT2: It is an individual effort by the school and our colleagues. Because there are no official documents to organise these events.

(BT2. Teacher Interview, Public school)

The second participant mentioned that some school programmes had started strongly but were not sustained because the Ministry of Education funded the programme then withdrew the funding at a later date. So, many schools had stopped funded programmes. However, the private school decided to continue the Dates and Milk Day programme using school funds, whereas the Islamic and public schools did not. So there is a problem with the sustainability of school programmes, as quoted below.

BT6: Once they did a dates and milk national day.

Ahmed: Do you mean a company selling dates and milk?

BT6: No, they did not sell it, it was free for students and it was only one or two days yearly.

Ahmed: Are there any other programmes?

BT6: There is the Feena Khair programme. I noticed this programme in the first year was very good, they brought everything we need to keep the classrooms clean. But unfortunately this support was stopped later on.

Ahmed: Why?

BT6: We don't know the reason, it is a matter for the school administration or the Ministry of Education.

(BT6. Teacher Interview, Public school)

The third participant mentioned that the school is not focused on students' health as a priority unless in the case of a health crisis, such as dengue fever. However, the school's role in this is limited to leaflets, as quoted below.

"In general, there was no interest in health issues in the school unless when some serious disease appeared, then the school would pay attention, for example when dengue fever happened they put posters in the school to increase the awareness of the students. But they did not give lectures or ask any professionals to talk about it."

(BT3. Teacher Interview, Public school)

The fourth participant mentioned that some programmes come from outside schools, such as by cooperation with the Ministry of Health. The cooperation with health professionals is a positive move; however, this type of programme needs to be focused on students' health needs at the primary schools, otherwise it will focus on general health issues which may not be considered as important to the students at primary school, as quoted below.

AT1: We had a health programme which was organised by the Ministry of Health and also we have many events in the school, such as, trees week, fireman week, sports week.

Ahmed: What happened in health week?

AT1: We contacted the Ministry of Health; they will send a medical doctor with a nurse and sometimes with some material helping them to explain to the students.

Ahmed: What type of lectures?

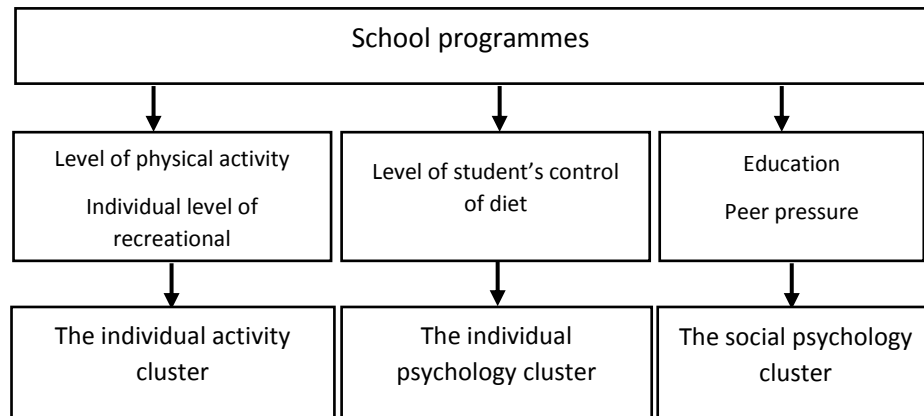
AT1: They talk about smoking cigarettes and taking drugs

(AT1. Teacher Interview, Public school)

Summary

School programmes are another sub theme, under the school philosophy, which may affect children's body weight in all schools. There are many programmes to encourage students to be healthy; for example, the Dates and Milk Day programme. Some of the schools continue to use these programmes and some have stopped. For example, the support for the Dates and Milk Day programme was stopped by the Ministry of Education, but the private school administration decided to continue with this programme because of the health benefits to the students. The private school decision to continue some programmes may be based on the headteachers or the school owner understanding the needs for these types of school programmes; however, this programme may not continue for the long term because of its budget. Schools programmes can have an impact on three clusters of the Foresight Obesity System Map, which are individual activity cluster, social psychology cluster and individual psychology cluster. For example, these programmes can affect the level of

physical activity and individual level of recreation and that is related to the individual activity cluster, as shown in the diagram below.



In conclusion, school health programmes offer many benefits to the students, teachers and schools; for example, improving students' behaviour, knowledge and school engagement. However, these programmes face many barriers such as sustainability and it is necessary to consider how to maintain the effectiveness of these programmes. For example, programmes are limited in number, they are not a school priority, or there is no cooperation plan with government and health organisations to support schools by providing them with basic materials, pamphlets or courses to continue running school programmes.

Theme 1: Sub-theme 4: The role of the Ministry of Education in the school system and philosophy

Introduction

The Ministry of Education plays a significant role in the school education system because it controls many important decisions. For example, the national curriculum and books, national start and end times for school semesters, national canteen systems, start and end times for daily classes, the total capacity of the school for students and staff and school systems. So, many important issues from upper to lower levels are determined by the ministry, such as

the link between the Ministry of Education and schools through official documents. In the past, the schools received official documents by mail carrier. In 2005 Saudi Arabia improved the education system by establishing the King Abdullah bin Abdulaziz Public Education Development Project (KAPEDP, 2017), so the schools now receive the official documents in two ways. The first is through the school e-mail system, and the second is through the Ministry of Education website. Therefore, the schools have limited authority in the distribution of the school subjects on the school timetable and on the appointment of subject teachers. Moreover, headteachers should inform the Ministry of Education of any decisions taken by them by sending a copy of that decision. Also, headteachers should report anything that occurs inside the school to the Ministry of Education, such as teachers' sick leave, students' issues and school building problems.

School capacity

Each school building was designed to accommodate one school. However, the Ministry of Education has the power to change this rule. For example, many school buildings in the city centre were being closed for the Makkah Government's new project and some schools buildings are too old and it is not safe for the students; therefore, the Ministry of Education makes many decisions. For example, integrating two schools within the same building of the Islamic school. This decision affects the school environment, as there is no room for a library, gym or sports hall; it even affects the school food times because the place is not capable of providing facilities for all three schools at the same time. Therefore, they divide the food time between three schools and the students must go down from the fourth floor and exit the building very quickly to buy food and eat it and go back to the classroom. This action affects students' health, as quoted below.

"I observed that the fourth floor has classrooms for the low grades such as grade one and two. Then I asked the teacher how they classified the

building. He answered me, 'In this building we have three schools'. I was shocked and I repeated that to him to confirm this information, 'three schools!' He said 'yes'. I asked him again why? He said 'one of the schools because it is inside the area of the Makkah project and the other one because the school building is too old and the school building report said it may fall at any time'."

(Field notes, Islamic School)

Another example of a Ministry of Education decision is the opening two schools in one building at different times, as happened in the public school. This was because many schools were moved from their original location to facilitate the expansion of the Hajj project. This decision presented huge challenges inside the school. For example, the students cannot use school facilities or they have limited access to them, such as the playground area at the end of the school day. The headteacher was under pressure to ensure that the shift between the two schools was safe and without problems. The teachers feel that the school does not belong to them. All these actions affected the school system and students' activities, as quoted below.

"When I noticed that I asked one teacher standing close to me what had happened. His answer was that the [Makkah Government Projects] forced many school buildings within certain areas to move, so the solution was to open afternoon schools for them in other buildings. So, they chose our own school buildings to cover one of those schools, and now the new school team and students are coming so we should leave. It was not an appropriate decision but what can we do?!"

(Field notes, Public School)

School curriculum

The Ministry of Education in Saudi Arabia is taking responsibility for developing the school curriculum and the education system does not authorise schools to add or to cancel any topic in the national curriculum. The Ministry of Education in Saudi Arabia established the school curriculum and then distributed it to the regions. Many participants were pleased with the new curriculum. The participants mentioned that the new curriculum contained many important health topics as quoted below.

“We have a topic under the title ‘Sweets for kids is a health disaster’ in the Arabic language. We start talking about sweets as the main topic, but we expand to many things such as soft drinks.”

(P2T2. Teacher Interview, Private school)

“We teach the Arabic language and we have one topic about excessive food intake and the teacher can connect this topic with body weight.”

(PT2. Teacher Interview, Private school)

However, many teachers mentioned that there is no school health education on how to maintain body weight and the current curriculum does not include that, as quoted below.

“In Maths, we are not exposed to this topic. But I would like to say to you, in general, the curriculum ignores the need for a topic about obesity.”

(P2T1. Teacher Interview, Private school)

“There are no official documents about controlling obesity, its causes or the ways to maintain body weight. Moreover, there is nothing about obesity in the school curriculum.”

(AT1. Teacher Interview, Public school)

“There is no programme focusing on body weight in the school or how to decrease it because we do not teach any subject related to that in the curriculum.

(BT3. Teacher Interview, Public school)

One teacher commented that the absence of obesity education in the curriculum stands as a barrier to students’ understanding of their body weight, and the teachers have no right to teach students topics which are not included in their curriculum, as quoted below.

“The students cannot understand obesity because the curriculum does not include it. Moreover, there are no subjects related to maintaining body weight, healthy foods, how to calculate healthy body weight. All of these issues are not in the school curriculum. However, these may exist in secondary schools. 54

(BT1. Teacher Interview, Public school)

The second participant added that he cannot talk about obesity inside the classroom because it is not in the school curriculum and because teachers are afraid of students’ reactions to the obese students. However, he could talk about obesity if it were in the school curriculum, as quoted below.

“I feel sorry because I did not notice or discuss the obesity issue with my students. I do not understand why this is, because no one from the students brought it up, or because I feel ashamed to talk about obesity inside the classroom, or because the topic may be very sensitive to some students, or the effect on the students’ life after the dissection. “

(I2T1. Teacher Interview, Islamic school)

Moreover, another participant commented on the absence of obesity as a topic in the new curriculum, it is a barrier to calling specialists from outside the school to give lectures on obesity, as quoted below.

“When I have a topic on the curriculum about obesity I can call on someone who is a specialist in this field, or talk to the school manager to call someone. Otherwise, the manager will not respond because it is not in the curriculum and he will say it is a sensitive topic for some students.”

(PT3. Teacher Interview, Private school)

The teacher commented that it is important to add the health topic to the school curriculum because when the message comes from the curriculum direct to the students it will be more effective, the participant recommended adding many topics to cover health topics such as nutrition, food groups and healthy diet in the school curriculum, as quoted below.

School health

The Ministry of Education system does not allow teachers to contact them directly. The teacher has to make contact with the school headteacher and it is his decision whether to refer the matter to the Ministry. Consequently, some teachers’ suggestions stopped at the level of the headteacher; therefore, many teachers mentioned significant issues relating to the role of the Ministry of Education in school health systems and the difficulty of getting their voice heard. Many participants make a strong link between the Ministry of Education’s vision and schools’ health improvement. Because the Ministry of Education does not have a strong interest in school health, health education will not be one of the top school priorities, as quoted below.

“The school did not focus on health education yet. There are many barriers; the first one is that there is no initiative from any organisations or government. Secondly, the school headteacher did not appoint one teacher to take care of that at the beginning of the academic year. Thirdly, all teachers are dependent on the students’ advisor to take care of these issues.” (Q2T1)

(I2T1. Teacher Interview, Islamic school)

“It is possible to change each school’s health care situation for the better if the Minister of Education is concerned with students’ health, so that he gives priority to students’ health care and mentions it as an important project to the Ministry of Education. Only then will we see the difference.”

(BT3. Teacher Interview, Public school)

“The school has no health education plan yet, because the Ministry of Education had no clear roles about health education at schools. They focus on first aid and how to take care of wounds only.”

(I3T2. Teacher Interview, Islamic school)

AT2: I hope that we will have the power to establish a health education programme inside the school, like in girls’ schools.

Ahmed: What do you mean “like in girls’ schools”?

AT2: Girls’ schools are very active in health education programmes.

Ahmed: Do you think that is because of the teachers or does it come from the administration?

AT2: I do not think it comes from the administration because we are the same. But why shouldn't it? We need an official order from the Ministry of Education, so we can then take this paper to the Ministry of Health to ask them to cooperate with us and other organisations.

(AT2. Teacher Interview, Public school)

However, some of the health organisations provide health education programmes for many schools, but unfortunately their goals are sometimes not suitable for the students' level, as quoted below.

"Some health organisations such as Cancer Awareness Organisation and Quit Smoking Organisation, visit our school, but as far as we know, the school has no students suffering from cancer or students who used cigarettes."

(I3T2. Teacher Interview, Islamic school)

BT2: We have a few health programmes, such as on international diabetes day, some diseases. They organise events by calling medical doctors to come and talk about a disease. However, these events are limited in number.

Ahmed: Why?

BT2: It is an individual effort by the school and our colleagues. Because there are no official documents to organise these events.

(BT2. Teacher Interview, Public school)

Also, some schools commenced health education, but it was limited and focused on few topics. One participant mentioned that the school's health education should focus on many important health topics and not only on a routine check-up, as quoted below.

“We have problems in health education. The health education in our school is rare. Most health education focuses on vaccinations. If we look, we can see many important topics to discuss at school with our students but we do that rarely.”

(IT1. Teacher Interview, Islamic school)

Some school activities support educating students about health issues. For example, the school exhibition, but this has a specific time and thus limited effect, as quoted below.

“We have a school fayre once a year. At this event, we have many corners. You can see our Achievements corner, as well as our Scientific corner where you will find a part related to obesity to educate the students about it.”

(I2T1. Teacher Interview, Islamic school)

There were many pictures in the school lobby made by the school. This included many different messages, such as Islamic values and healthy food education, as quoted below.

“In the school' lobby I noticed many pictures. They give different messages. The quality of some pictures was good and other not. They show many things, such as good values, mathematical tables and pictures of healthy food.”

(Field notes, Public School)

Many teachers mentioned that there is no cooperation with any type of strategic health plan between the Ministry of Education and the Ministry of Health in improving students' health care. Therefore, two teachers called for a strategic health plan in the school, as quoted below.

Ahmed: Do we have a connection between a primary health care centre and the school?

BT3: Yes, but it seems something has been changed.

Ahmed: What is that?

BT3: We do have primary health care and one health clinic in the Ministry of Education centre. However, in fact, we have no plan or vision on the health situation in the school. It is just a reflective process; for example, we have found many health brochures inside the school during the time of health crises. But we do not see practical things.

(BT3. Teacher Interview, Public school)

BT6: Thirteen years ago, the primary healthcare centre was very active with schools. People came to the school many times during the year, for example, to give students vaccinations, to institute dental hygiene programme, to give lectures on international health day and healthy food..

Ahmed: These things happened before, but what about now?

BT6: It was activities only. Now since that time we have had no strategic plan from the Ministry of Education with the Ministry of Health. For example, there is no strategic plan between the Ministry of Education and the Ministry of Health with regard to obesity. If we have strong direction from the Ministry to the school then we will do a good job in the school.

(BT6. Teacher Interview, Public school)

Three teachers sent recommendations to the Ministry of Education to take action to change the school systems. The first participant recommended opening a health clinic in each school. However, he recommended that one general practitioner cover six schools to ensure this recommendation was implemented, as quoted below.

“To improve students’ health in schools, I recommend opening a clinic in each school and employing one doctor to cover six clinics in six schools in one area, so the doctor can then spend two hours or a full day in each school.”

(BT6. Teacher Interview, Public school)

The second recommendation was to recruit one employee as a health nutritionist in the schools to maintain students’ bodily health and another health professional to identify students who have health issues in the school and provide a place for a school clinic, as quoted below.

AT1: We understand the importance of children as the future generation. So we need to do more in regard to body weight.

Ahmed: Like what?

AT1: We need nutritionists to guide our children toward better health and protect them from serious diseases. As you know the government has spent lots of money on their treatment. The reason for most of these diseases is the types of food we eat.

AT1: We hear from the news that the Ministry of Health plans to employ a nurse or nurse’s assistant in all schools.

Ahmed: Good news.

AT1: Yes we need them to not only do the basic first aid but also to understand the health situation of the students and discover any other sicknesses too, such as mental health problems too.

(AT1. Teacher Interview, Public school)

However, one teacher from the public school explained the importance of the teachers' role in students' healthcare, as quoted below.

The role of a teacher, who is in the position of being a student advisor, is very important and we work together to support our students. Students sometimes face many difficulties in their lives, such as losing their parents or suffering from different illnesses, such as obesity, so we are concerned about their situation until they affect change to get better.

(AT1. Teacher Interview, Public school)

He mentioned that the school has student health classifications, so they record the students' health situation in their files, as quoted below.

The health situation in the school is divided into three categories; first we categorise students who had their medical records and know about their health, such as diabetes. Secondly, students become ill because they come across infections and viruses. Thirdly, there are students who face temporary incidences, such as divorce.

(AT1. Teacher Interview, Public school)

Another teacher mentioned the importance of the parents' role in students' healthcare, as quoted below.

We have parents who care about their children's health, because when the teacher calls them they come to the school immediately. However, some other parents do not care even when we have called them many times.

(BT6. Teacher Interview, Public school)

One teacher from the public school explained the importance of healthcare services in students' healthcare. He described the role of the healthcare centre in the school; however, this role is limited in terms of the variety of services, as quoted below.

We have a health clinic in the Ministry of Education; unfortunately, nowadays it has no role in schools and I think it has stopped. We cooperate with the health care centre at the beginning of the year to conduct a general check-up on students' health. Also, they give students vaccinations, which is important as we know that Makkah has received millions of people yearly to perform the Hajj and the students need some vaccinations to protect them from being exposed to disease.

(AT1. Teacher Interview, Public school)

The teachers in the public school highlighted many significant points relating to the barriers to a good healthcare system in their school. The first participant mentioned that there were no guidelines to deal with students' healthcare and the school administration has no healthcare plan, as quoted below.

BT3: I taught in many different schools and from that experience. I noticed that the absence of healthcare among all schools is the common thing.

Ahmed: Really!

BT3: Yes, I know that is shocking!

Ahmed: Yes.

BT3: But this the reality. We cannot get any attention nor any signs that will let us understand that the school administration are interested in health issues in the school.

(BT3. Teacher Interview, Public school)

Another teacher described barriers at the healthcare centre which impacted on the provision of acceptable healthcare. For example, teachers need the initiative to come from high authority, as quoted below.

We need an official paper from the Ministry of Education calling for health education lectures and activities as a yearly timetable. If this is done, the school can then cover certain health topics each year depending on the plan and by using this plan we can ask other organisations to support the school and foster good teamwork and present these topics to the students.

(AT2. Teacher Interview, Public school)

School timetable

The Ministry of Education sends the basic rules for the school timetable to all schools. For example, Arabic at least eight lessons per week. When schools receive these rules they put them into practice. However, the school can add to the basic timetable but it has no authority to cancel any of the original instructions.

For example, from observation in the public school, I noticed that the school timetable sent from the Ministry of Education was implemented as it is without change. The school

timetable shows only two lessons per week that can improve students' physical activities and this is exactly as given by the Ministry of Education.

In the Islamic school the situation is different. They have seven lessons per day for five days a week unlike the public school, which has seven lessons per day for three days and six lessons for two days. However, the Islamic school reduced the lessons of physical exercise to one lesson per week. Moreover, from my observation not all students in the Islamic school participate in the physical activity lessons. Therefore, this school timetable may work negatively regarding the students' body weight.

The school timetable in the private school is very distinguished regarding physical activities compared to the two other types of school. The private school added two new lessons, which are swimming and Taekwondo as shown in the timetable below (Table 5.1).

Table 5.1: The private school timetable

Days	1	2	3	4	5	6	7	8	9
Sun	Science	Quran	Arabic	English	Maths	Social	Science	Islamic	Arabic
Mon	Arabic	Islamic	Arabic	Math	Drawing	Drawing	Quran	Maths	English
Tues	Arabic	Science	Computer	Quran	English	Maths	Islamic	Quran	Quran
Wed	English	Arabic	English	Science	Maths	PE	Islamic	Taekwondo	Swimming
Thru	Arabic	Social	Maths	Arabic	Maths	Science	Islamic	PE	English

As shown from the private school timetable, there are four important lessons per week that can improve students' physical wellbeing: two physical exercise lessons, one swimming lesson and one Taekwondo lesson. The private school timetable has many lessons per day compared to other schools; however, this timetable may work positively to improve the students' body weight.

Many factors led to the variation between the three schools' timetables. The first factor is the rules and regulations of the Ministry of Education, some schools were happy to implement them without any changes, such as the public school. The second factor is the school aims and objectives. For example, the private school plans to attract more students to enrol so they focus on children's preferences, such as swimming. The third factor is headteachers' priorities. For example, the Islamic headteacher believed that physical education lessons are not more important than other subjects.

The role of the headteachers

School headteachers are representing the Ministry of Education in schools. They receive the rules and regulations from the Ministry of Education. The headteachers are trying to implement these rules as they believe that this is the best way forward for their school. For example, during the period of observation, I was sitting in the teachers' room and I saw a different type of student desk design. I brought a chair and I tried to use this type of table to write on its surface. I felt that it was not a comfortable table, so I asked the teacher if he would mind if I changed my place. The teacher said that this table design was just for the main tables in the school, but the Ministry of Education in Makkah recommended that the school changed all student tables, because this design is not suitable for students. Therefore, the owner of the school accepted that recommendation immediately and he invested a significant amount of money to replace the school tables.

"The teacher said; many years ago, the students used this type of table at the school, but it has been changed to the normal tables, based on the recommendation of the Ministry of Education in Makkah"

(Field notes, Private School)

During the observation in the public school, one participant mentioned that the power of change is evident when the headteacher shares the same goals as the Ministry of Education, so the key to change in each school is the headteacher, as quoted below.

"The teacher said, 'Actually, we noticed a change when the headteacher cooperated with the Ministry of Education to change certain things. For example, when we needed to make some changes in the playground such as covering the surface to protect the students from sunlight. The headteacher got approval from the Ministry of Education. Then he called on many people to support this project and received a full budget for it from donations. He pointed his hand to toward the uncovered place and to the covered place and he said now you can see the difference.'"

(Field notes, Public School)

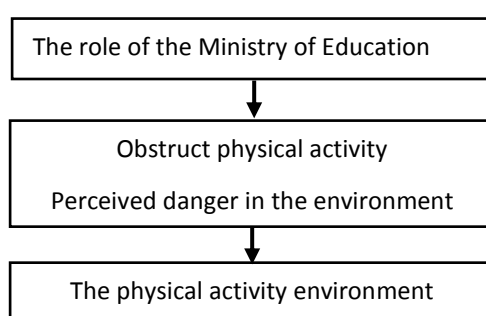
In support of the above statement, I noticed that more than half of the school's lobby was covered in a special carpet that is used during noon prayers at 12:30 pm, and because of the shortage of staff the school had decided not to remove the carpet. This action limited the space in the school lobby and would also affect students' physical activity, as quoted below.

"It was 8:00 am, when I entered the public school. Before I entered the headteacher's office, I noticed that the lobby of the school was covered in carpet; it seemed to be ready for prayers. However, the prayer time had not come yet! And the students were not allowed to walk over that carpet. When I asked the reason behind this, the teacher said it was because they had a shortage of workers to do this job every day. "

(Field notes, Public School)

Summary

The role of the Ministry of Education in the school system is the third sub-theme of the school system and philosophy. This sub-theme includes school capacity, school curriculum, school health, school timetable and the role of headteachers. It is clear that the Ministry of Education has responsibility for authorising many issues concerning schools, such as choosing school buildings, building schools and establishing many of the school systems. When the authorisation comes from high authority to schools, without opening feedback from teachers and students, this can create a gap between the Ministry of Education and a school's needs. For example, teachers cannot talk and cannot invite health organisations to schools to speak about ways in which students can maintain healthy body weight because it is not part of the school curriculum. The role of the Ministry of Education in the school system can have an impact on one cluster of the Foresight Obesity System Map, which is the physical activity environment cluster. For example, some school decisions can be barriers to physical activity and a perceived danger in the environment. All that is related to the physical activity environment cluster, as shown in the diagram below.

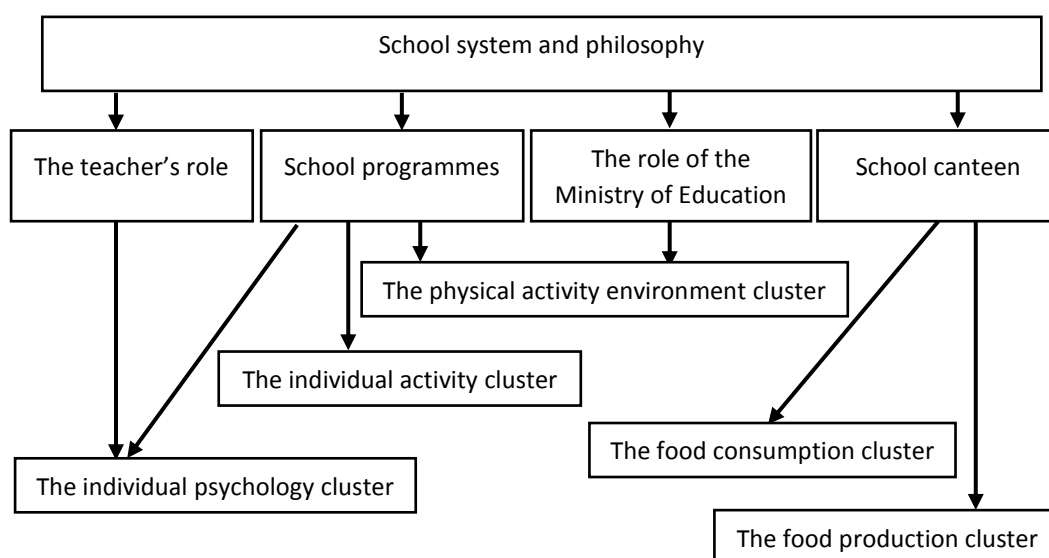


The problem here is that the Ministry of Education has not paid sufficient attention to some important aspects, such as students' health. For example, each school has a different way of dealing with emergency cases and schools face many health issues that they cannot address. However, the Ministry of Education makes many academic and non-academic decisions for schools, for example integrating many schools into one school building. Another example is

that the school curriculum is prepared and distributed by the Ministry of Education to all schools. However, headteachers have the power to take decisions when they want to. For example, when the Ministry of Education sends the school curriculum, the headteacher in the private school adds many physical exercise lessons to the school timetable.

Conclusion

The previous chapter describes the factors that may affect children's body weight. The chapter consists of the school system and philosophy as one theme. This theme was divided into four sub-themes, which are the teacher's role, school canteen, school programmes and the role of the Ministry of Education in the school system. The final sub-theme includes five headings, which are school capacity, curriculum, health, timetable and the role of head teachers. The school system and philosophy through teachers' roles, school programmes, the role of the Ministry of Education and the school canteen can have an impact on five of the clusters of the Foresight Obesity System Map, which are the individual activity cluster, the physical activity environment cluster, the food consumption cluster, the food production cluster and the individual psychology cluster, as shown in the diagram below.



Therefore, a school's system and philosophy is one of the factors that may affect children's body weight through the teacher's role, school canteen, school programmes and the Ministry of Education's role.

The teachers in the public school are practising health promotion as they feel they have a duty to interact with students and discuss health issues. However, the teachers' in the Islamic school are facing heavy workloads due to shortage of staff. Therefore, teachers could have a valuable role in health promotion but they need to have a strategic approach outlining whose responsibility it is, and schools need more staff so teachers have time to include health promotion.

The school canteen is the second sub-theme of the school system and philosophy. This theme affects children's body weight as headteachers are dependent on the school canteen as the only source of school income. As a consequence they may focus on the sustainability of income from the school canteen regardless of the availability of healthy food. In addition, this may affect the evaluation of food quality in the school canteen. Therefore, the Ministry of Education should prioritise the students' health and support headteachers in dealing with the school canteen in order to improve the quality of food regardless of the school canteen income. There are many recommendations in this sub theme, such as educating school canteen contractors about food and students' health, nominating a nutritional specialist at school to improve students' health and evaluating the school canteen.

The school programmes is the third sub-theme of the school system and philosophy. This theme affects children's body weight because there are many programmes running in all types of schools, some of them focus on students' health so these programmes bring benefits to the students. However, some programmes face difficulties continuing or have been stopped. Therefore, the programmes should be re-evaluated, focused and supported in order to continue helping and supporting students to improve their health.

The role of the Ministry of Education is the fourth sub-theme of the school system and philosophy. The Ministry of Education has the power to initiate change. However, school headteachers are the only way to access them and discuss issues relating to the schools. Headteachers can make decisions to support students' health and they can make a request for the Ministry of Education's decision. When the authorisation comes from high authority to schools, without opening feedback from teachers and students, it can create a gap between the Ministry of Education and a school's needs; therefore, the Ministry of Education should work together with headteachers and teachers to plan and implement good decisions for the benefit of students' health and well-being.

CHAPTER SIX: PHYSICAL ENVIRONMENT

Introduction

The physical environment includes the natural environment, such as weather, and the built environment, such as school facilities; the data analysis shows many important points about the private, public, and Islamic school physical environment. Two themes are presented which describe the physical environment. These are the school canteen, the school facilities. Each theme includes evidence such as field notes, teacher interviews and student interviews to clarify it.

Theme 2: Sub-theme 1: The school canteen

In the previous chapter the school canteen was discussed under the theme school system and philosophy, for example how it works and its rules and regulations. This chapter will focus on the school canteen as an environment, such as its location and its design. The data analysis shows many similarities and differences between the schools' canteens. All school canteens were located outside schools. For example, at the public school, the canteen was attached to the school building, and at the Islamic school, the canteen was close to the main school building. At the private school, the canteen was not far away from the primary school building. The private school canteen was less than a five-minute walk for the students. Therefore, the school had made a covered path to make the walk to the canteen easy for the students under different weather conditions as described by the following field notes.

“The canteen was in a separate building from the main building of the private school. The primary school students used the pathway to reach the school canteen. The canteen from outside looks good and the doors were open and there were no crowds”

(Field notes, Private School)

Although all schools had a separate place for the canteen, there was a problem with capacity. The school canteen at the public and the Islamic school was a single room located outside the school building. The room had three windows at the public school and one window at the Islamic school, these were used for students to order food. Neither the canteen at the public school nor the canteen at the Islamic school looked clean from the outside. Each canteen was in poor condition and there was no space for eating, these affect the students' health when it comes to food-ordering time, as quoted below.

"I went down to the school canteen with the students and some teachers at break time. I noticed that the school canteen had only one window where the students choose their food. I was shocked because the window from outside was very dirty and small compared to the total number of school students, and the weather outside was hot. More than that, there are no sun shades and the students have no queue to buy food."

(Field notes, Islamic School)

BT3: In the school, there are many problems in the canteen. Yes, the workers in the canteen have a health and safety certificate, but the problem is that the canteen has very limited space.

Ahmed: What do you mean?

BT3: I mean we have no space where students can eat their breakfast.

Ahmed: You mean in the school canteen?

BT3: Moreover, no tables and chairs can seat more than one hundred students eating there.

Ahmed: Oh

BT3: We also have no posters fixed close to the canteen to educate the students about healthy food.”

(BT3. Teacher Interview, Public school)

The situation at the private school canteen differed. It was inside a separate building and consisted of a big hall with many tables and chairs. Although there were many tables and chairs inside the canteen building, unfortunately there were not enough for all the students. Therefore, I observed that some students left the canteen building with their food packages.

“I saw all chairs full with students and some students prefer to eat standing instead of waiting for vacant chairs and others were sitting on the canteen floor whereas some of them decided to go out of the school canteen.”

(Field notes, Private School)

The school canteen infrastructure in the Islamic and in the public school is not well designed. The Islamic and public schools kept any remaining food inside the canteen, however the air conditioning system did not have the capacity to include the school canteen. The air inside the school canteen was hot due to weather conditions outside and the lack of effective air conditioning. I noticed during my observation that the canteen workers kept most of the biscuits and long-life juices in their usual place. The temperature can affect food quality, which, as a result, affects the students' health, as quoted below.

“When the school was about to close, I saw the canteen worker collecting the remaining sandwiches and putting them in his bag, then he kept everything as it is. He turned off the air conditioner and he turned off the light and he closed the canteen door and left the school.”

(Field notes, Islamic School)

In support of the above statement, I noticed that there are no cabinets for storing food and hygiene standards were very low at the Islamic school, whereas the contractor of the public school canteen was anxious and afraid of being reported. I tried my best to explore the school canteen from inside, as quoted below.

“From the canteen windows in the public school I saw the contractor sitting inside. I asked him if I could see the types of food that he provided to the students. He said they were in front of me. I saw many biscuits, long-term juice. But I wanted to see all the food types from inside the canteen. I asked him to go inside the canteen. He agreed. However, I noticed that he was not happy. Then I said I just wanted to know! He replied I would report him! I said I would but I would not mention your name or which school. Then I said to him, I also wanted to compare between our generation and this generation in regards to the food types. He said that is fine. Then he allowed me to go inside.”

(Field notes, Public School)

Summary

From the above discussion, it is clear that the school canteen is one of the factors that may affect children's body weight. The physical environment at the private school canteen seems to be in good condition; however, it needs to pay more attention to supplying healthy food such as fruit. In the Islamic and the public school, through my observation of the two schools, the school canteens looked in poor condition. For example, the windows from outside were very dirty and I saw that the iron was rusty. So, this theme has many negative sub-themes. An example is that their canteens were only one room, which was without tables and chairs, so the students had unhealthy food behaviour such as eating whilst walking around.

Therefore, teachers from the public school and the Islamic school recognised that the students suffer because of the canteen infrastructure and this is not part of their responsibility.

Theme 2: Sub-theme 2: The school facilities

Another factor which falls under the physical environment theme and that may affect children's body weight is the school facilities. I found during my observation that the private schools were very distinguished with regard to school facilities and that private school showed evidence of money being spent in order to create a good school environment, starting with the high cost of installation and repair of the central air conditioning and modern lifts in the school building. The private school also place great importance on their indoor and outdoor playgrounds. They have a large building for the gym, which contains a sizeable swimming pool and a place for playing football.

"We entered the sports club. It was really distinguished by many things such as the presence of a large swimming pool"

"The school has a gym and underground floor, which contains a large hall, equipped for use in sporting activities"

(Field notes, Private School)

The private school also has a large open stadium with good facilities and two play areas. The two play areas have carpet on their floors to protect the students when they play, and it covers the surface to protect the children from sunlight.

"I saw a big stadium in front of the school building with many stairs for sitting to watch the match. Some of the places were covered to protect students from sunlight and some were not"

*"I saw a group of students wearing sports clothes at small stadiums
with their teacher"*

(Field notes, Private School)

The private school opens its facilities to the students after school time. Therefore, participants noticed that some of the students used the facilities during school time and after school, which is a good way to support students in maintaining their regular physical activities, as quoted below.

*"Many students go to sports clubs, and we have a gym at the school
that is open at school time and afternoons for those who have
memberships, and we have many students attending in the afternoons
because they want to lose weight."*

(PT3. Teacher Interview, Private school)

The action mentioned above is supported by six out of nine students who participated in this study from the private school. They recommended doing sport to maintain a healthy body weight.

*"To do different type of sport at home or at the backyard such as
abdominal sports, back sports and jump."*

"Do a lot of sport that helps the circulatory system to work better."

(Students interviews, Private School)

School physical environments in the Islamic and the public schools were not designed in a way that supports students' physical activities in different weather conditions, because the weather can prevent students' from taking part. One participant mentioned that the weather can stand as a barrier against playing and doing some physical activities, as quoted below.

"As we all know the Makkah temperature is very hot, and it is not suitable for kids to go out of the house and play in their backyard or race freely in front of their houses as in other countries such as Egypt, and the normal situation of children here is to relax under air conditioning for long time."

(P2T3. Teacher Interview, Private school)

School facilities at the Islamic and the public school were not in a good condition compared to facilities at the private school. The Islamic and the public school do not have facilities such as a swimming pool, gym and library. Other facilities, such as outdoor areas, were not prepared well and some facilities are restricted, such as the school lobby. The school lobby at the Islamic and the public school should function as an indoor playground. However, the lobby in both schools was inadequate. In both schools, the lobby was covered with a mosque carpet. The difference between the two schools is that the lobby in the Islamic school was surrounded by a barrier to keep the carpet clean. This action limited the space available and this affected the students' physical activities by preventing them from moving around, as quoted below.

"When I entered the Islamic school, I noticed that the school lobby was covered by carpet. It was surrounded by ironwork a half-metre. This action works as a barrier for students from rapid entry to keep the place clean for praying and if the students want to cross the lobby to the other side, they will stop and remove their shoes. Some students ignore this instruction and they just jump and run to the other side."

(Field notes, Public School)

The function of a school lobby is to give free space for students to walk around within the school however, students' physical movement at the Islamic and the public school lobby was

limited and I noticed that the air inside the lobby of both schools was hot. Because the weather outside was very hot and the air conditioners were too old and insufficient to cover the lobby, this can be a barrier to students' physical movement, as quoted below.

"The school's atmosphere was a little hot, because there is no central air conditioner but separate air conditioners. There are limited air conditioners inside the school lobby and they were not enough to cover the space. So walking in the school was inconvenient"

(Field notes, Public School)

The school administration of both the public and the Islamic school were not interested in the outdoor facilities. . The public school has a large schoolyard with two sections. In the first section, there is a furnished playground area, this area is covered to protect students from the direct sun and to enable students to be physically active. The second section is not covered or furnished and this limits physical activity. The situation at the Islamic school was worse. I saw a playground outside, but there was no grass so it would not be suitable for football. This makes it difficult for students to enjoy playing, running and walking, as quoted below.

"The Islamic school has four floors and no car parking and the outside school facilities offer one playground which is not prepared well to play. When I walked inside the Islamic school, I looked for a school library and sport facilities. I could not find it, so I decided to ask the teacher about it to guide me to it. I asked one teacher who walked close to me, he stopped walking and looked at me with his smiling face and he said 'sorry man we don't have a library and we don't have inside sport facilities'. I said thank you and continued searching for that. Unfortunately, in time I concluded that he was right."

(Field notes, Islamic School)

It is clear that the Islamic school facilities do not support physical exercise among the students, consequently the students have little or no opportunity to participate in physical activities for many reasons. Firstly, the school has no good facilities. Secondly, there is a huge number of students at the school. However, ten out of twelve students from the Islamic school who participated in this study recommended doing sport and running to decrease body weight.

“Run daily in the street”

“Doing sports”

“Doing sports and eat little”

“Continue sports, not overeating and continue moving”

“Doing sports”

(Students interviews, Islamic School)

Physical environment is important in the Islamic and the public school to motivate students to increase physical movement. Eight out of twelve students who participated in this study from the Islamic school recommended doing sport to maintain a healthy body weight.

“Doing sports and eat healthy food”

“Amm, playing sports, eat and do sports to burn the food”

“Eat fruits, do sports and physical exercises”

(Student interviews, Islamic School)

Summary

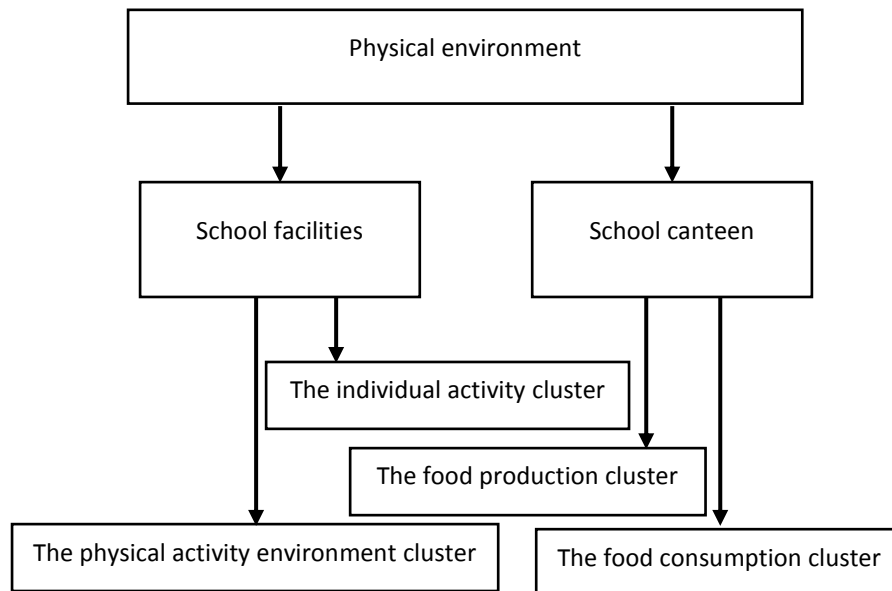
It is clear that school facilities are one of the factors that may affect children's body weight. This sub-theme has many distinctive aspects in the private school. For example, the school

has indoor facilities such as a swimming pool and sports area. These facilities support students to be more physically active, because the school keeps the physical activity sessions running as usual despite weather changes. In addition, the students in the private school can use these facilities after school time. Building these facilities and opening them for the students to use when school closes for the day was a good decision by the school. It helps to support students maintain a healthy body weight. However, this sub-theme also has many negative aspects in the public and the Islamic school. Both schools have poor facilities and some restrictive rules. For example, there were barriers to using the school lobby as the students could not move easily inside it. In addition, the outdoor sports facility was not prepared for use in extreme weather conditions. These poor facilities can present barriers to students' physical activity. It is also clear that the weather is one of the factors in the schools that may affect children's body weight. This sub-theme has many negative aspects particularly in the Islamic and the public school. The outdoor sports facility in both schools is not prepared for use in varying weather conditions. This poor facility can present a barrier to students' physical activity. In contrast, the indoor and outdoor facilities at the private school support students in becoming more physically active, the school keeps the physical activity sessions continuing as usual despite weather changes. In addition, the students in the private school can use these facilities even after school time.

Conclusion

The previous chapter described the theme of physical environment factors that may affect children's body weight. The chapter consisted of two sub-themes. The sub-themes were school canteens and school facilities. The data analysis shows many important points about the private, public and Islamic school physical environment. Physical environment through school canteen and school facilities can have an impact on four clusters of the

Foresight Obesity System Map, these are the individual activity cluster and the physical activity environment cluster, as shown in the diagram below.



It is clear that the school canteen infrastructure indirectly affects children's body weight, particularly in the Islamic and the public school, because students in both schools suffered when ordering and choosing their food from the school canteen and the food was limited in quantity and poor in quality. Moreover, there were no chairs and tables for the students to sit and have their meal. The significant issue is that one teacher mentioned the difference between what is officially written by the Ministry of Education as guidelines for school canteens and what the schools are practising. Teachers from all schools believe that changes to the canteen situation requires an integrated effort and it is not their responsibility.

The school facilities are a factor that may affect children's body weight. This sub-theme had many distinctive aspects in the private school; for example, the school has indoor facilities such as a swimming pool and sports area. However, the public and the Islamic schools had poor sports facilities and restrictive rules were in place to control students' movements. Moreover, the outdoor sports facility was not prepared for use in varying weather conditions. Poor facilities can present barriers to students' physical activity. Finally, weather

is one of the factors that may affect children's body weight in the schools by restricting their physical activities both inside and outside. Therefore, schools should consider designing the school facilities in order to cope with the weather conditions of that area.

CHAPTER SEVEN: STUDENTS' HEALTH

BEHAVIOUR

Introduction:

Students' health behaviour includes many themes such as students' understanding of preferences, student society and community, media and food advertising, students' schools, and ways to change students' health behaviours.

As this theme focused on students' health, it is necessary to understand the schools' role in dealing with student health issues. During the observation, I talked to people from all types of schools, and it is obvious that schools are not concerned about health issues. In fact, it is good that many teachers, across all types of schools, are concerned about their students' health. They like to have rules in place regarding school health issues and they need to know their responsibilities, but it seems that the current situation is complicated and they cannot influence change as individuals because health issues are not the top school priority. Some of the teachers highlighted the problems and suggested solutions. For example, teachers across all the schools were concerned about students' health knowledge and health behaviour, as quoted below.

"It is very sad to observe unhealthy behaviour. I feel that the students' health has a strong link to their awareness. We are suffering from unawareness. For example, it is impossible to see more than one student wash his hands before and after his breakfast. It is rare. One of the bad situations is when students come back to the classroom after having had breakfast and their mouth is still full of food and they talk to you or bring the remaining food with them."

(BT3. Teacher Interview, Public school)

"I observe the students eat either meals or chocolates at all times; at breakfast time; in the time between lessons, by the end of the school day, I observed in his hands chocolate and sweets, although he is going to his house. He should depends on the meal at his house, but unfortunately not"

(PT1. Teacher Interview, Private school)

"There are many health behaviours in eating. These behaviours can affect the students' body weights, such as washing hands and eating good food."

(I3T2. Teacher Interview, Islamic school)

Few teachers mentioned that students are healthy and aware of healthy issues, as quoted below.

"I noticed that some of the students like drinking milk. I also noticed that sometimes I give them sweets as a reward for doing something good, but they say sorry we do not eat them and they refuse to take them."

(BT2. Teacher Interview, Public school)

However, a few students mentioned that they should eat healthy food to maintain healthy body weight, as quoted below. This was true for all types of school.

"I eat healthy food such as fruits and milk. Al abstain from sweets and things with oils."

(Student Interview, private school)

From the data analysis across all cases it appears that teachers tried to voice their concerns about students' health behaviour and gave recommendations in order to change unhealthy behaviour among the students. After integrating all interviews, it appears that there are four sub themes all of which can have an impact on student health behaviour from the participants' perspectives. These sub themes are students' understanding preferences, students' society and community, students' media and schools. The last sub theme is about ways of changing students' behaviour.

Theme 3: Sub theme 1: Students' understanding preferences

The data analysis shows that students and teachers from all types of primary schools believe that unhealthy food is very tasty. Teachers believe that the first reason for students' choice of unhealthy food is taste. During the observation I noticed that the children were eating unhealthy food and sharing it with friends. They enjoyed it and thus it has an effect on their choice of food, as quoted below.

"I noticed many of the students enjoyed eating fried potatoes in small cardboard in the schoolyard"

(Field notes, Private School)

"The students' health in general is good. However, we feel sorry that the students love fast food too much and they do not buy the health food available."

(I3T1. Teacher Interview, Islamic school)

"The students knew that some types of food increased their body weight and still continued to eat them. Moreover, they knew that they eat unhealthy food just because they like that type of food. They are

afraid to talk about unhealthy food with anyone because they think that that person will stop them from eating it.”

(AT1. Teacher Interview, Public school)

“Some of the students focus on fast food such as; beef burgers, fried chicken, and all fatty food. Some of them have unhealthy pattern because they depend on ready food which is not useful to their health”

(PT3. Teacher Interview, Private school)

“The majority of the students in the school decide to spend less money on sandwiches and juices. Their money is spent on fried chips, sweets and other unhealthy foods. They spend much money buying unhealthy food because it is sweet and very tasty.”

(AT1. Teacher Interview, Public school)

Many students mentioned that they like to eat fried chicken because it is tasty and one of them mentioned that healthy meals are delicious meals, but he mentioned fast food as an example, as quoted below.

“The healthy food is tasty such as fried chicken.”

“I like to eat fried chicken and fruits”

“I like to eat Kabsa (rice with meat) and fried chicken”

“The fried chicken is very tasty; however, doctors’ advice is not to eat fried chicken more than once a month”

(Student Interview)

The second reason is that many teachers attributed the students’ choice of unhealthy food and their poor health behaviour to the fact that they are still children. Some of the teachers

mentioned that students' unhealthy behaviour will change by the time they reach the next school level, as quoted below.

"The students in this level do not pay attention to body weight. This idea will not cross their mind. However, this can happen at the next school level such as intermediate and high school."

(IT1. Teacher Interview, Islamic school)

"The students at these levels I think they understand obesity in general, but they do not understand the context of obesity and its causes. I never hear them say this word in school."

(BT1. Teacher Interview, Public school)

"What I think is that the students will mention sports with regards to maintaining their body weight, but they will not mention eating. They have no deep background about this topic and so cannot control themselves at this age. Therefore, when they feel hungry they will eat whatever is in front of them, healthy or not."

(I2T2. Teacher Interview, Islamic school)

"It is difficult for the student who is 12 years old and under to be aware of the link between body weight and his health. He is not aware yet. That is why he is not concerned about increasing his body weight or not."

(P2T2. Teacher Interview, Private school)

However, the student interviews revealed that fourteen out of thirty-three students who participated in this study asked for support to help them to reduce their body weight, whereas, only two students asked for help to increase their body weight.

“Yes, I want to be skinny, skinny too much.”

“Yes, I want to increase my body weight a little bit.”

(Student Interview, Islamic school)

Teachers believe that the third reason contributing to the students’ choice of unhealthy food is that students have a limited understanding of obesity. An interesting point coming from teachers’ interviews is that they focused on students’ limited understanding and not on their responsibilities or the curriculum with regard to increasing students’ awareness. For example, students are not aware of factors that lead to obesity, as quoted below.

“The children know that obesity is connected with overeating. But they are not aware of the other factors which may affect their health, such as, physical activities and the health issues in the food, such as, quality and the variety of food. The students will go back home from the school, they will find their lunch is ready, then they will eat and sleep and they don’t know that this behaviour can affect their body weight.”

(AT2. Teacher Interview, Public school)

“Obesity is a disease which makes humans obese and they cannot move quickly. The cause of obesity is eating harmful food such as uncovered food and low useful food and drink soft drinks”

(IS3. Students Interview, Islamic school)

“Those students, who are not aware of health, they do not understand obesity and they are not aware of its complications. Sometimes, the student does not choose a good meal to eat; for example, he chooses to eat high fat food.”

(PT1. Teacher Interview, Private school)

“Obesity is a disease that comes to humans because of overeating and they eat fat food, and the effect of obesity is swelling of the human.”

(PS3. Students Interview, Private school)

“I expect that the students know about obesity but they have no deep understanding about that. Therefore, they do not know that obesity is the accumulation of fat in the body and it can affect arteries. All they know is that obesity is increasing body weight.”

(I2T1. Teacher Interview, Islamic school)

“Obesity is an increase of body weight and it is not good that a person uses medicine to reduce obesity because this is a big mistake. I mean, they should use medicinal herbs better because it is safe.”

(GS4. Students Interview, Public school)

In support the above statement, whilst I was walking outside the public school I saw that the students had started their physical exercise session. The children were playing football but spent a lot of time complaining to each other instead of doing the exercises. The problem is that there was no teacher interested enough to guide them in their sports session; not even the sports teacher, as quoted below.

“I heard sounds coming from school playground. When I went there, I saw students playing football and there was no teacher was watching them. Their noise level was very high and indicated dissatisfaction with play. They spent lots of time talking to each other to solve the problems. When I talked to the teacher about the situation he replied ‘do not worry! They are kids and this is normal because children do not accept a result from each other quickly.’”

(Field notes, Public School)

Moreover, in order to understand the students' knowledge about body weight, I asked them three questions - what advice would they give people who want to maintain, reduce and increase their body weight? Fourteen students from the student interviews advised people to eat everything when they wanted to increase their body weight, as quoted below.

"Eat, for example, rice with meat, pasta, and drink Pepsi, soft drinks to increase body weight."

"To increase body weight drink soft drinks, eat fried food, eat a lot of food."

(Students. Interview, Private school)

Furthermore, I designed a children's pamphlet to encourage them to interact with me in the interviews. From the literature I asked three questions which had not been asked in previous studies, I asked the children. 'What advice would you give to people who want to increase their body weight?' Twelve students advised people who wanted to increase their body weight to eat unhealthy food, even if it was harmful to their health, as quoted below.

"Eat a lot of unhealthy food and little healthy food."

"Eat in restaurants because the sandwiches from restaurants are always harmful."

"To eat sweets and oils- I mean to eat everything with oils and sweets and chocolate."

(Students. Interview, Private school)

"Eat unhealthy food such as sweets and soft drinks"

"Eat fatty food such as burgers, fried chips, artificial food and sweets."

“Overeating, drinking soft drinks, fried chips, do not play sports and stop walking”

(Student Interview, Islamic school)

“Eat much sweet and eat fast food”

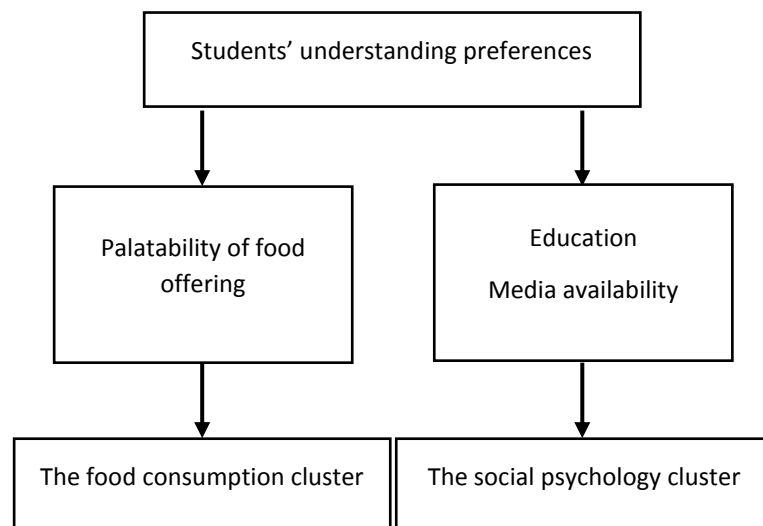
“Overeating, eat fatty food and stop doing sports”

“Drink soft drinks, eat sweets, overeating”

(Students. Interview, Public school)

Summary

From the above discussions, it is clear that the teachers believe that students seek out tasty food regardless of whether it is healthy or unhealthy food, and they referred to reasons such as student age. Students’ understanding preferences can have an impact on two clusters of the Foresight Obesity System Map, which is food consumption cluster, and social psychology cluster. For example, the palatability of food offering in schools is related to food consumption cluster, as shown in the diagram below.



In primary school students are not yet capable of understanding everything related to health. The fact is that the students need more education to increase their understanding of healthy

food and body weight. Also, schools should establish a school health policy and guidelines. Moreover, teachers need to understand their role in student health.

Theme 3: Sub theme 2: Students' society and community

The students' community and society can be factors affecting students' health. Across all cases teachers were concerned about that. For example, teachers mentioned that both the community and society judged the students about their body weight and this may lead the students to change their health belief and behaviours, as quoted below.

"The negative health behaviours existed among the students because of the strong connection with the culture of the community. The culture of the community was affected by the variety of families' incomes. Even me, when I see the students are eating sweets and drinking soft drinks, I do not advise them to stop that because I practise these things. I know I should be a role model. The other cause that affects body weight of the students in this school is the climb up to the fourth floor many times daily. This of course impacts on teachers but will have a strong impact on students' body weights."

(I2T1. Teacher Interview, Islamic school)

"The majority of the students do not focus on maintaining a normal body weight, because in general society is not encouraging people on this topic. I really appreciate this type of study as it increases societal awareness"

(BT1. Teacher Interview, Public school)

"The majority of the students like to talk about underweight even if they are slim students, and they are not interested to talk about weight

gain because the number of the students who want to talk about weight gain are very limited.”

(P2T2. Teacher Interview, Private school)

BT3: When you are thin, people in society will ask you why you do not eat enough.

Ahmed: Is it harming them?

BT3: Yes, because the society makes strong connections between body size and eating. However, there are many factors that can cause obesity.

(BT3. Teacher Interview, Public school)

Moreover, one of the students from the Islamic school mentioned that he uses the word ‘obese’ sometimes to insult people in the community, as quoted below.

“I am saying this word on the street when I fight with others.”

(Students Interview, Islamic school)

Two of the students from the private school mentioned that they need community involvement to maintain a healthy body weight, as quoted below.

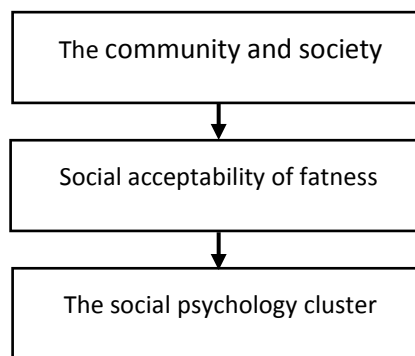
"It is possible to forget that you are on a diet, so you need people such as your family members or friends reminding you and supporting your decisions"

(Students Interview, private school)

"I need to reduce my body weight. For example, I need to go to a gym, become a member ask coach to help me to focus on my exercises so that I can practise myself"

Summary

From the above discussions, it is clear that the community and society can have an impact on students' health. The community and society can impact on one of the clusters on the Foresight Obesity System Map, this is the social psychology cluster. For example, community and society can affect the social acceptability of fatness and that is related to the individual psychology cluster, as shown in the diagram below.



However, the students need the community and society's support to maintain healthy body weight. Therefore, in planning any student health programmes, the community and society's awareness should be included.

Theme 3: Sub theme 3: Students and media and food advertising

Many teachers mentioned that media can negatively influence the students food choices leading students in primary schools to choose unhealthy food and change their health behaviour For example, one teacher mentioned that the media can have an adverse effect on students' food choice, as quoted below.

"I think that the students build their knowledge from different sources such as the school and media. So when it comes to body weight they

will remember that and advise people to eat fruits and vegetables to reduce their body weight for example.”

(IT2. Teacher Interview, Islamic school)

BT3: When we look at the big fast food companies now, you can see how they attract the children.

Ahmed: How?

BT3: You can see inside many food restaurants that there are big playgrounds designed for kids. They also prepare special meals for kids with small gifts. So the kids will ask their family to go to certain restaurants to play and eat. On the other hand, there are no health education programmes and these restaurants are not forced to print health brochures to educate their visitors.

(BT3. Teacher Interview, Public school)

“May Allah bless you, the issue of the students is not only in our hands, but it is the responsibility of the media too. May Allah protect us and all our children.”

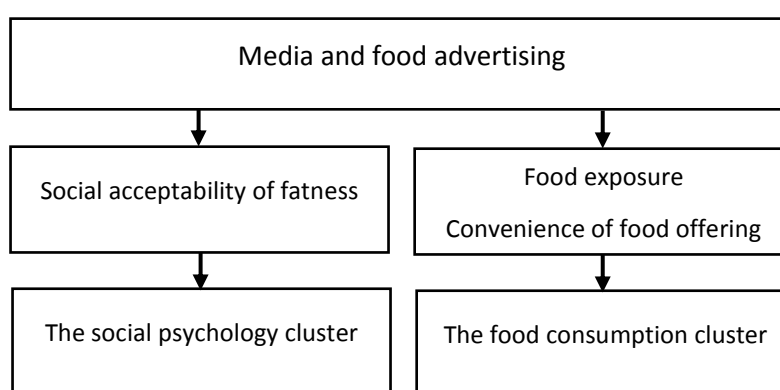
(P2T3. Teacher Interview, Private school)

“I notice that the majority of the student are smitten with Pepsi. The word Pepsi means a lot to them, it is valued. As we know, many researchers mentioned that Pepsi is a very harmful substance to children. The problem of the students is their nutrition; we know it is very bad.”

(P2T1. Teacher Interview, Private school)

Summary

It can be seen that media and food advertising have an impact on students when they choose their food. Media and food advertising can have an impact on two clusters of the Foresight Obesity System Map, these are the social psychology cluster and the food consumption clusters. For example, media and food advertising can affect the social acceptability of fatness and that is related to the social psychology cluster, as shown in the diagram below.



Another example, this sub theme can affect the convenience food offering and that is related to the food consumption cluster.

Theme 3: Sub theme 4: Students' schools

During the teachers' interviews it became obvious that the teachers believed that schools are a second home for students because they spend a long time at there. So across all cases teachers were concerned that the school was one major factor influencing students' health, this might be through school canteens, infrastructure, programmes, standards and teachers. The first example is that many teachers focus on types of foods provided by school. School provide unhealthy food and thus students have limited healthy choices, as quoted below.

"The school did not provide the students with healthy food. However, when the school provided them with healthy food the students will not

buy that. They like to buy sweet things. Some students bring food from their house.”

(I3T2. Teacher Interview, Islamic school)

“We do not know if the students will buy apples or not because the school canteen prepares fried chips and the children will look for what they desire. But if you stop selling fried chips in the school canteen and bring good food in I am sure they will buy it because they are hungry.”

(BT6. Teacher Interview, Public school)

“In fact, because we stopped students from bringing unhealthy foods, so many times we found inside the school hidden sweets, shrimps in what they call family size. We blame their parents for their silence about buying these types of food.”

(AT2. Teacher Interview, Public school)

Poor school infrastructure is the second reason for the school having a negative impact on students' health. The public and the Islamic schools have no appropriate place to eat, whereas the private school had. However, some of the students at the private school after buying their breakfast looked for a place to sit and they could not find vacant chairs to sit on. So some of them eat their breakfast while they are standing, others decide to go outside the canteen looking for shade to sit in and eat, as quoted below.

“I saw five students eating their breakfast and they were talking to each other. Three of them were standing. One of them was overweight and the second one on the right looked obese, whereas the third one was very thin”

(Field notes, Private School)

Through observation and interviews, school programmes such as the Feena Khair programme had begun and finished after achieving its goals. Some of the schools programs have limitations such as limited resources and poor implementation. But these programmes can support schools to provide good facilities and they can also help students learn how to choose healthy food and practise healthy behaviour, as quoted below.

“The students’ health awareness in the school is increasing; for example, you notice that some of them bring hand sanitizer with them in their bags. The good thing is that students like copying from each other. We also support that with programmes such Feena khair and we provide the school toilet with all facilities that help them to be clean. Even in the classroom- if you come with me now you will notice the classroom is clean with the facilities to keep it clean all the time and this will be reflected on the students’ personal hygiene.”

(P2T2. Teacher Interview, Private school)

The fourth example is school rules and regulations which can help students to increase their knowledge and information so they choose healthy food and practice healthy behaviours. For example, students change their healthy behaviours because of the school, as quoted below.

BT3: Previously the community was not interested in health issues.

Ahmed: Why is that?

BT3: Because of poverty and limited education, which we were brought up on.

Ahmed: What about now?

BT3: Now this issue has changed due to many reasons. First, we are wealthy, praise be to God. Secondly, we became well educated and we can receive health information easily. Therefore some of the schools have changed children's health behaviour for the better.

Ahmed: Such as what?

BT3: My nephew is at the King Abdullah University of Science & Technology. His daughter goes to the babysitter and they changed her health behaviour completely so it is much better.

(BT3. Teacher Interview, Public school)

Another example is the Islamic school admission standards which are different from other schools, this may increase the understanding of health and health behaviours among students before their enrolment, as quoted below.

"The health situation among the students is good because they are in an Islamic school. To be students in the Islamic school means that you pass the evaluation process before entering school. The evaluation covered many things such as; memorising many chapters of the Quran, knowing the alphabet and numbers and having some life skills. These standards bring good students to the Islamic school and those students are knowledgeable and they almost care about their physical activities and body weight."

(I2T1. Teacher Interview, Islamic school)

However, some school decisions can influence students' eating. For example, in one school students from low grades (3 to 1) were eating their breakfast while sitting inside the school

lobby watching cartoons. Some of them paid more attention to the cartoon than to their breakfast.

“When I came back to the primary school I observed a screen inside the school lobby, and the students watched cartoon and ate breakfast.”

(Field notes, Private School)

School teachers help students to increase their knowledge so they understand health and health behaviour. For example teachers can give real examples from students’ lives to link that with the health issues so the students will understand it, as quoted below.

“We have studied topics under the title overeating and we linked it with some types of food. Also, we had a workshop about that topic. After that, the students would answer all questions. This topic increased the students’ knowledge and they became aware of healthy eating habits”

(PT2. Teacher Interview, Private school)

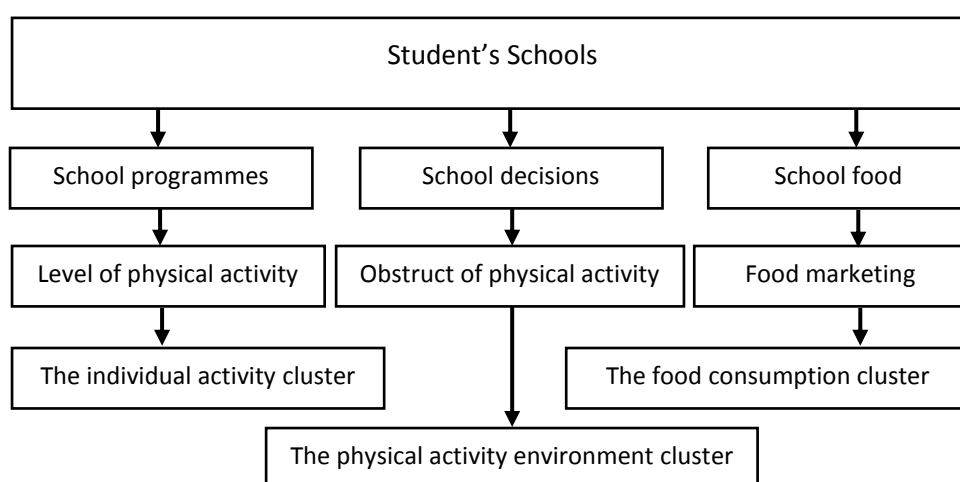
“I saw the teacher with the students outside the school in the playground area. The teacher tried his best to guide the students to do some physical exercises. However, some of them asked the teacher to start a particular exercise but the teacher was committed to finishing that exercise first.”

(Field notes, Private School)

Summary

It is clear that students spend a long time at their schools and, during this time, they interact with many things such as school canteens, infrastructure, programmes, standards and teachers. All these can work as dependent and independent factors in students’ health. Students’ schools can have an impact on three clusters of the Foresight Obesity System Map,

which are individual activity cluster, food consumption clusters and physical activity environment cluster. For example, students' schools can affect choices of school food and that is related to the food consumption cluster, as shown in the diagram below.



Another example, this sub theme can create barriers to physical activity and that is related to the physical activity environment cluster.

Theme 3: Sub theme 5: Ways to change students' health behaviours

Following discussion with many teachers it was evident that they believe that those who work in school programmes at the Ministry of Education have little experience with children. Teachers believe that they have gained experience due to spending time with students over many years and therefore have a better understanding than those who work with adults or in the offices. Thus, they have tried to send recommendations to the educational authorities to support teachers and to make a success of school programmes. One participant mentioned that in primary schools students need something to attract their attention. For example, when we should decide to use a cartoon film or other children's films to send effective messages.

BT3: We have no clinics to treat those children who suffer from obesity.

Moreover, we have no sports facilities targeted at children. So I think if

we use cartoon films they are suitable to send a good message to

students in grades four and less. And I think this way is not suitable for grades five and six.

Ahmed: So what is suitable for them?

BT3: I think we can make a film with children who are the same age and we can take videos from real lives such as from hospitals and those children can advise them how to control body weight.

Ahmed: Why this way?

BT3: Because students in grades five and six feel that they belong to the secondary school and they are mature enough.

(BT3. Teacher Interview, Public school)

Another teacher mentioned that using prizes to encourage student participation is a good way to attract students and therefore achieve health goals, as quoted below.

“Not all the students like to play, only about two thirds, and the rest do not like to take orders or restrictions – if you told him to do exercises he would do it reluctantly. You must take advantage of incentive and prizes to make him exercise. You can make them play some small games or preliminary games to serve your purpose, such as catch a colleague, hit the colleague with the ball or touch his shoulder; make them compete do not do orders which they hate.”

(P2T3. Teacher Interview, Private school)

The teacher also thinks that staff could use popular games within the children’s communities to achieve the health goals, as quoted below.

“He is playing because he loves it, but we can use this love for the sake of social, cultural and religious habits.”

(P2T3. Teacher Interview, Private school)

Other teachers mentioned that teaching staff should recognise the level of the students to send the healthy message using suitable methods, as quoted below.

"I noticed that it is easy to change the students' behaviour or implement any projects in grade four and below. Grades five and six become difficult. They feel they are different and big enough to participate in Fina Khar programmes."

(BT6. Teacher Interview, Public school)

"As I mentioned earlier the school has acceptance standards and these standards select good students, so the students are smart with healthy bodies, because they follow the Islamic standards in eating. The majority of the students' families in Islamic school tried their best to practise what we can call the healthy prophet rules such as eating with the right hand, eating food but not until full stomach, do not eat with full stomach."

(I2T1. Teacher Interview, Islamic school)

One teacher recommended more health education programmes for the students to improve their health and health behaviours, as quoted below.

"I expect that the students are aware of how to maintain their body weight and even how to increase or decrease their body weight. However, we feel sorry and to be honest with you, we need more education to increase awareness among all of the students about their body weight."

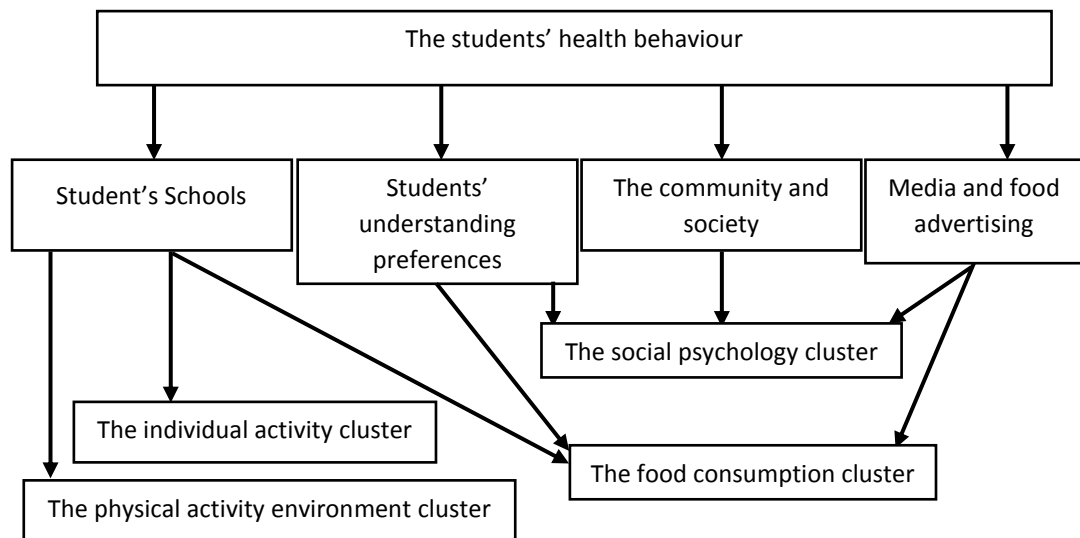
(I3T1. Teacher Interview, Islamic school)

Summary

It is clear that teachers believe that working with students for a long time has given them valuable experience; therefore, they want the Ministry of Education and authorities to listen to their comments and recommendations to improve the practise of the Ministry of Education projects in schools.

Conclusion

The previous chapter described the theme of students' health behaviour, within this theme there are many sub-themes which work as factors that may have an impact on children's body weight. The chapter consists of five sub-themes. The students' health behaviour, through understanding students' preferences, student society and community, student and media advertising and students' schools, can have an impact on four of the clusters of the Foresight Obesity System Map, these are individual activity cluster, physical activity environment cluster, food consumption cluster and social psychology cluster, as shown in the diagram below.



The sub-themes were understanding students' preferences, student society and community, students and media advertising, students' schools and the ways of changing students' behaviours. Therefore, understanding students' preferences in primary schools, together with the impact of society, schools and media advertising, can have a strong effect on students' health and health behaviours. The Ministry of Education did not take account of teachers' feedback in order to improve the students' health output programmes. Also, the Ministry of Education has not issued health standards to deal with students' health issues inside schools.

CHAPTER EIGHT: OUTSIDE FACTORS THAT AFFECT STUDENTS' HEALTH

Introduction

Outside factors that affect students' health include media, family and language. These themes were integrated to present outside factors that affect students' health in all schools. Each theme included evidence such as field notes, teacher interviews and student interviews with which to understand their effect on the students' health.

Theme 4: Outside factors that affect students' health

Theme 4: Sub-theme 1: Media

Media and social media are affecting the new generation. They are gaining much information from different sources. This can be positive; one of the students from the Islamic school mentioned that TV plays a role in spreading the word 'obesity' to the people, as quoted below.

"I hear the word 'obesity' on TV and with some of my brothers, which is not good. It reflects on very huge bodies"

(Students Interview, Islamic school)

Few teachers were happy with the way students use the media. For example, one teacher mentioned that the students were now more aware of their body weight and health issues, because the media sends health messages that are acceptable to children, as quoted below.

"In regard to maintaining body weight among children, especially these days, they are using new technologies to read more. I have noticed that

the students come to the school with new information. They have become aware of what is going on around them. Some of them can talk about body weight but not all. However, the negative health behaviours among the students need to be studied.”

(BT2. Teacher Interview, Public school)

However, the media and social media can be negative too, leading to students obtaining incorrect information, as quoted below.

BT3: We know many students who said eat this and do not eat that. We are optimistic about the new generation being better because they have many ways to obtain knowledge in different aspects, one of which is health. The students are using many different types of media. They can go to their Facebook and Twitter accounts to educate themselves.

Ahmed: What is the reason for this change?

BT3: Because the community is now improving and caring.

Ahmed: Why?

BT3: Because the majority of them have become educated. You can see now that people care about their health more than before.

(BT3. Teacher Interview, Public school)

That is why teachers call on all media organisations in the country to take responsibility for improving children’s health by producing health programmes, as quoted below.

“I call on the brothers, those who work in media programmes, to give more attention to the children and how they care to have healthy body weight.”

(P2T1. Teacher Interview, Private school)

What is remarkable is that many teachers mentioned that the media affects the students' knowledge and behaviour because it brings stories to support the effectiveness of their products in order to convince people to buy them, as quoted below.

"I think students know many things about body weight because it is widespread among all types of media. I saw on TV many programmes make a strong effort to convince people that by using their products they will change their life. For example, they show some people who used their products and lost 50% of their body weight and now they have a healthy body weight and their life has changed to a better situation."

(I2T1. Teacher Interview, Islamic school)

The second participant mentioned that the media now focuses on playing football and we can see how children think too much about this sport, as quoted below.

AT1: The students do not focus on regulation of meals or the types of food they eat, but they do focus on football.

Ahmed: That is all? I mean no other things?

AT1: As you know, the power of the media means that more than 90% of students are thinking and talking about football, who won the game, who lost it, why they won, etcetera.

(AT1. Teacher Interview, Public school)

Many teachers, across all schools, believe that the media has a strong influence on children's health; however, for example the television was not concerned about children's health, as quoted below.

BT3: Media and Media, I am very sure that if we conduct a study about the role of our media in regard to health we will find the result is very poor.

Ahmed: You mean you have to study?

BT3: No I mean there is no role for our media in relation to our health.

Ahmed: How?

BT3: Did you remember when many people died accidentally by inhaling toxic substances when they were cleaning their homes? Instead of making an announcement to educate people to stop using these substances and save their lives the media ran advertising for many other cleaning substances.

(BT3. Teacher Interview, Public school)

Another example supporting the above statement is that the media presents football more than health issues and other types of sport. Therefore, children focus on football as a sport and they are not interested in any other sports, as quoted below.

“You will find 99% of children' thinking and their focus is on football as a favourite sport because of the influence of media. The media have a strong influence on the children; for example, the way the man screams to describe the goal. He spends five minutes on that scream, as if a disaster happened. The children love that and they say it is amazing! If we change the curriculum to the way of the football broadcaster, the boys will love to study!”

(P2T1. Teacher Interview, Private school)

Teachers not only believe that the media has a strong influence on children's health, they also mentioned that the media is targeting children to gain more money. For example, the media is focusing on football to encourage children to buy games about football, as quoted below.

"I want to say something to you because you asked about the health programme in the school. We feel sorry for the children and young children for the types of programmes targeting them! The majority of the productions focus on the football matches and violent games and unfortunately children buys this stuff."

(P2T1. Teacher Interview, Private school)

Teachers from the Islamic school recognised that the media repeats the advertisements many times to convince the children to eat unhealthy food, as quoted below.

"Some advertising through media focuses on certain types of food such as fried chips and chocolate. These types of advertising affect the students' food habits and that can affect students' body weight."

(IT2. Teacher Interview, Islamic school)

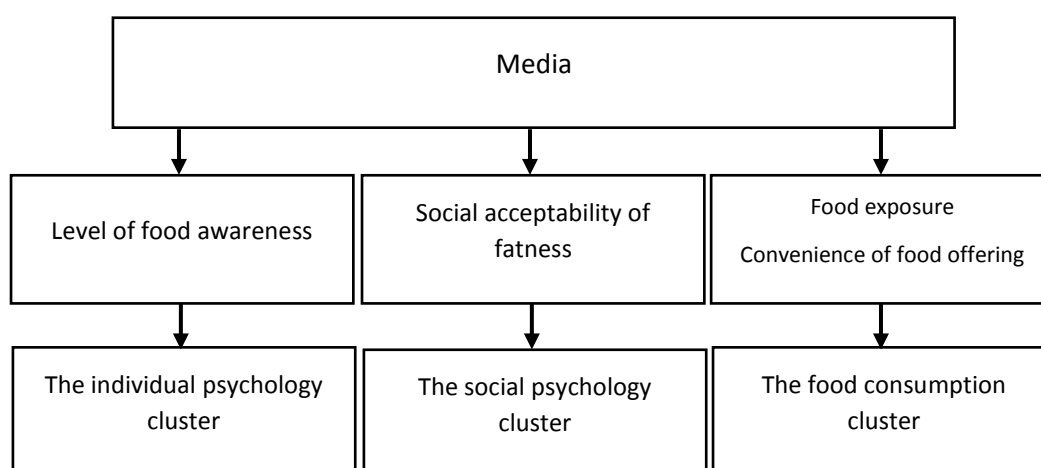
Moreover, the media uses attractive methods such as featuring stars and appealing pictures to advertise unhealthy food. Therefore, students may change their eating habits because of the media, as quoted below.

"May Allah bless you, the issue of the students is not only in our hands, but it is the responsibility of the media too. May Allah protect us and all our children."

(P2T3. Teacher Interview, Private school)

Summary

From the above discussion, outside factors that affect students' health is the last factor that may affect children's body weight in all schools. This sub theme is the media, which includes many warning messages. The government media focuses more on football than other physical activities and advertising for food companies. Media can have an impact on three clusters of the Foresight Obesity System Map, which are social psychology cluster, and individual psychology clusters and food consumption cluster. For example, media can affect the level of food awareness and that is related to the individual psychology cluster, as shown in the diagram below.



The significant issue is that the media can influence children's health, because students are dependent on the media to gain knowledge and health information. In addition, the food companies use various media to advertise products such as unhealthy food and they use stories and repeat their advertising many times to convince the children to consume their products.

Theme 4: Sub-theme 2: Family

Many teachers across cases agreed that the families' education is important to children's health. The first participant mentioned that awareness and taking responsibility are much

improved nowadays compared to many years ago. He described the current students' health situation as better compared to the past and he attributed this to the education of the family, as quoted from the teacher's interview below.

"In general, recently I think it is better because of the education. There is a high percentage of family awareness of many things, such as obesity. In general the percentage now is lower than before."

(P2T2. Teacher Interview, Private school)

Another teacher supported the idea of increased family awareness, he had noticed that some children were on a diet and their families were supporting them in controlling body weight, as quoted below.

"Some students suffer from obesity and I think they follow the diet schedule with their parents."

(PT2. Teacher Interview, Private school)

The third participant recognised that families today are educated in many different fields. However, their education has a limited impact on their children's behaviour, as quoted below.

"Now we know that parents are more educated than the older generation. Today, we can see in the family member a nurse, a doctor, or a teacher and that is why we find the students look nicer than in the past. However, their behaviour has become worse than before. We really struggling from massive social media which bring bad behaviours such as violence"

(AT1. Teacher Interview, Public school)

One of the students interviewed mentioned that his family educate him about obesity, as quoted below.

"I swear to God I heard this word 'obesity' from my father. He says that word and gives me advice"

(Student Interview, Islamic school)

Therefore, many participants recommend starting to educate the family as a first step towards change, because the students at this age are not aware of the complications of obesity, as quoted from the teacher's interview below.

"Obesity can cause harm to students. Students at this age are not aware of the seriousness of obesity. We must start educating the family, to warn the family to take care of children's meals."

(PT1. Teacher Interview, Private school)

"The health behaviour among the students differs because of the parents. The parents themselves need to be educated. Imagine that milk is not in the students' meals, they have apple juice but not fresh juice. I prefer that the students bring bottle of milk or milk with chocolate better than that. I am not confident enough that parents will pay for healthy food if we think about implementing this idea."

(BT6. Teacher Interview, Public school)

In contrast others mentioned that even among the families that were educated, some do not take responsibility. For example, one participant mentioned that family could be a factor that plays a strong role in students' body weight, as quoted below.

BT3: Do fathers know their responsibility, such as buying healthy food from restaurants and cooking healthy food at home. I do not think so."

Ahmed: Why don't you think so?

BT3: Because fathers are a small part of a big picture. The problem is in the school, and another problem is the lack of food awareness, because of the lack of health awareness due to lack of efforts from the media and the Ministry of Health.

(BT3. Teacher Interview, Public school)

Many participants blamed those families who do not care about their children's body weight and they support them in eating anything, as quoted below.

"We still have families' intervention. They will give their children extra money, I mean more than the cost of basic food, so the children will buy fried chips and other bad stuff that have not even 1% benefit."

(I2T2. Teacher Interview, Islamic school)

"I wonder about those parents who know that their children are buying unhealthy food and they do not ask them why and where they will take them."

(AT2. Teacher Interview, Public school)

Another participant supported the above statement, he recognised that not all families are the same. Some families are not giving enough attention to their children's health, as quoted from the teacher's interview below.

"The health status of the students is different. We cannot say all students are the same. Some of them take care of their health because of the family support, whereas with some of them I observe there is insufficient attention to their health"

(P2T1. Teacher Interview, Private school)

Many teachers across all schools mentioned that families could have a negative impact on children's health for many reasons. The first reason is the low level of family awareness and education, which can affect a child's body weight, as quoted below.

"I wonder if the children now twelve years old and their families have not noticed that their children suffering from their body weight. Maybe there is a reason behind this obesity, such as a problem with the child's glands. And maybe the fathers do not want to control their sons or the father is busy with other stuff."

(BT6. Teacher Interview, Public school)

The second reason is that some families were afraid that their children would be hungry so they tried to offer any type of food.

"The student's mother is sometimes afraid. She feeds her son any kind of food, whatever comes to her mind? As evidence of that, the phenomenon I have started to recognise is I always see the student with food in his hand, anywhere, at any time, in the school, and sometimes he is not hungry!"

(PT1. Teacher Interview, Private school)

The third reason is that the family food habits at home can increase their child's body weight, as quoted below.

"Some families have fried chips, soft drinks, and other bad food stuffs at their home. So sometimes, the students bring unhealthy food to the school from their home. I am really confused because I do not know if it is made at home or they just bought it from markets such as Shawerma. I do not know who can eat that early in the morning."

(I3T1. Teacher Interview, Islamic school)

The fourth reason which affects children's health behaviour is that if being overweight is common in the child's family, the child will not notice their own abnormal body weight.

"About obesity, sometimes I talk to the students about it, I notice that some of them give me good information and some of them are not interested. I have spoken to some of them and they replied that the whole family were the same size and nobody in my home talked to me about it and I think the child thought that was the normal situation."

(BT2. Teacher Interview, Public school)

The fifth reason is that the children's food was not the top priority for the families. The participant supported his idea through observing parents' behaviour. Some parents will monitor what their children are interested in buying but in the case of food, they will not take the same interest. They just send them with the money, as quoted from the teacher's interview below.

"When the parents send children to buy food they send them alone, while they do not send their children alone to buy computer games. That is caring!"

(P2T1. Teacher Interview, Private school)

Three participants across the cases pointed out the importance of communication between school and home. For example in the case of planning to improve children's health status, as in the quote below.

"The roles of home and school are complementary to each other. Failure of one of them means failure of the other. For example, when a

student wants to start a diet without encouragement from home and school he will find he cannot continue.”

(P2T3. Teacher Interview, Private school)

The second teacher focused on the role of the students’ families. He mentioned the importance of the school and the home working as a team to achieve the goals, as quoted below.

“We need the family to do more. We need to see the family support the healthy food and choose good food for their children particularly in this age. They can control their children.”

(I2T2. Teacher Interview, Islamic school)

However, many participants complained about poor communication between the teacher and the family regarding the food issue. One participant attributed this to the sensitivity of the topic for some families, as in the quote below.

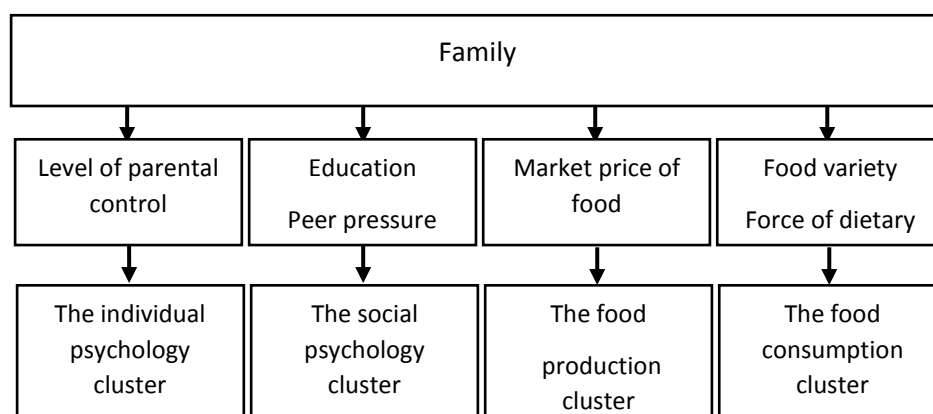
“Of course, there is no communication between home and school to know their diet, of course this is caused by sensitivity. It is not realistic to ask the family about the food in the home, this is a sensitive topic.”

(P2T1. Teacher Interview, Private school)

Summary

Outside factors that affect students’ health are the last consideration that can affect children’s body weight across all cases. The first sub theme is families. These sub themes show the importance of families in maintaining children’s healthy body weight. Parents’ education level and awareness currently is better than before and this can help students to maintain a healthy body weight. However, the parents’ education programme should include the family’s responsibilities and their role in supporting their children to keep them healthy.

Family can have an impact on four clusters of the Foresight Obesity System Map, which are individual psychology cluster, social psychology cluster, food production cluster and food consumption cluster. For example, the media can affect the level of food awareness and that is related to individual psychology cluster, as shown in the diagram below.



This sub theme mentioned many reasons for families being led in the wrong direction. For example, parents’ low awareness about health issues can stand as a factor affecting children’s health. Secondly, their negative behaviour can lead to children being overweight. Therefore, many participants recommend strengthening the communication between schools and parents despite the sensitivity of the health issues.

Theme 4: Sub-theme 3: Language

The majority of health educators used classic Arabic language in their discussion, so they used the words obese and obesity. The issue is that most of the students do not understand the health messages, because many participants mentioned that students face a language barrier in understanding the words obese and obesity. For example, the first participant commented that students do not understand the meaning of many health issues and are not aware of the problems obesity can cause, as quoted below.

“But the students do not understand the meaning of obesity, and perhaps the issues of health and the effect of obesity on their health.”

(PT1. Teacher Interview, Private school)

The second participant supported that statement. He mentioned that many students asked him about the meaning of obesity and he tried to explain it in more detail, as quoted below.

“They do not recognise the meaning of obesity. Because they do not use this word, they use fatty, huge, but not the word obese. In class when we come across the word obesity, they ask me, what does that mean? So I try brainstorming with them to collect all words related to obesity.”

(PT3. Teacher Interview, Private school)

Many teachers mentioned that language barriers and the limits of using the word obesity so the students know another word, as quoted below.

“The students know obesity by using another word, which is “Dob”, which means ‘bear’. This is what we commonly use in the Western region. When the students get angry with each other or when they play football, they use this word “Dob”. ”

(I2T1. Teacher Interview, Islamic school)

“I do not think students know the meaning of obesity; this information is very simple. They use the word ‘bear’ not ‘obesity’ at all. ”

(P2T3. Teacher Interview, Private school)

“In primary school the students start recognising their body shape and they referred obesity to the word ‘Dob’, and it reflects a huge body. The clear meaning of obesity among the students is the word ‘Dob’. However, children do not know the effect of obesity.”

(I2T2. Teacher Interview, Islamic school)

One participant referred to the age of the students in terms of understanding many words and that is why some students do not recognise the meaning of obese, as quoted below.

"In the students' age group, we hear them use words such as fatty students or bear, we may hear the word obese in high grade students but not in grade six."

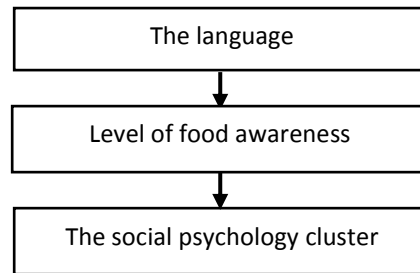
(P2T2. Teacher Interview, Private school)

Classical Arabic is the official language of Saudi Arabia. However, many Saudis speak an informal version that differs slightly from the original classical Arabic language. Twelve students across all cases mentioned the word 'Dob', which means 'bear' as another word for obesity and nine students mentioned the word 'Matten' to describe obesity. Moreover, it seems that many students have their own words and they are not using the words that describe obesity in classical Arabic.

(Students. Interview)

Summary

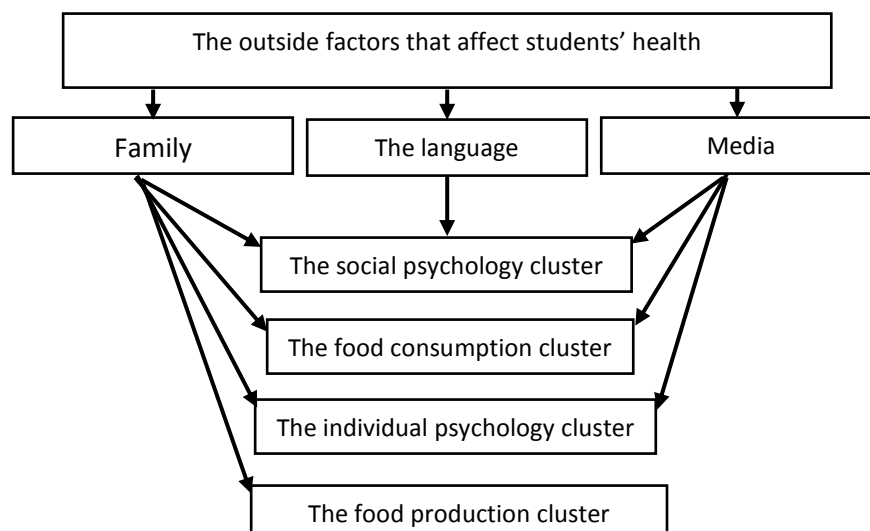
Outside factors that affect students' health is the last factor that may affect children's body weight in the private school. This sub theme is language. This can include many warning messages, for example, the language theme describes how students use many words to describe obesity such as "Dob" which means bear in English. The language can have an impact on one cluster of the Foresight Obesity System Map, which is the individual cluster. For example, language can affect the level of food awareness and that is related to individual psychology cluster, as shown in the diagram below.



The problem here is that teachers and health educators are using Classical Arabic language such as “Semnah” to describe obesity and this word may not be understood by students at this age because they use the word “Dob” instead of “Semnah”. Moreover, fourteen of the students said that they had never used this word in their lives.

Conclusion

The previous chapter describes factors that may affect children’s body weight. The chapter consists of one theme: outside factors that affect children’s body weight in all schools. This theme was divided into three sub themes, which are: media, family and language. The outside factors that affect students’ health through media, family and language can have an impact on four clusters of the Foresight Obesity System Map, these are social psychology cluster, food consumption cluster, individual psychology cluster and food production cluster as shown in the diagram below.



Media as a sub theme has many warning messages. For example, media can influence children's health, because students recently are dependent on media to gain knowledge and health information. In addition, the food companies use media to advertise products such as unhealthy food and they use stories and repeat their advertising many times to convince the children about their products. Moreover, there was no national children's health advertising protocol.

Families stand as a strong sub theme under outside factors that affect children's body weight across all cases. These sub themes show the importance of families in maintaining children's healthy body weight. However, there are many reasons for families being led in the wrong direction when trying to keep their children healthy. For example, parents' low awareness about health issues can stand as a factor affecting children's health. Secondly, their negative behaviour can result in children becoming overweight. Therefore, many participants recommend strengthening the communication between schools and parents despite the sensitivity of health issues.

Finally, language as a sub theme demonstrates that there is a gap between students' use of language and the word that teachers and health educators use and this language gap can affect the students' understanding of obesity and its complications.

CHAPTER NINE: DISCUSSION AND CONCLUSION

Introduction

This final chapter summarises the findings, contributes a discussion and conclusions, and makes clear what contribution this thesis makes to existing knowledge, it closes with recommendations. The aim of this thesis was to explore each of the three types of school (public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia. The study sought to explore:

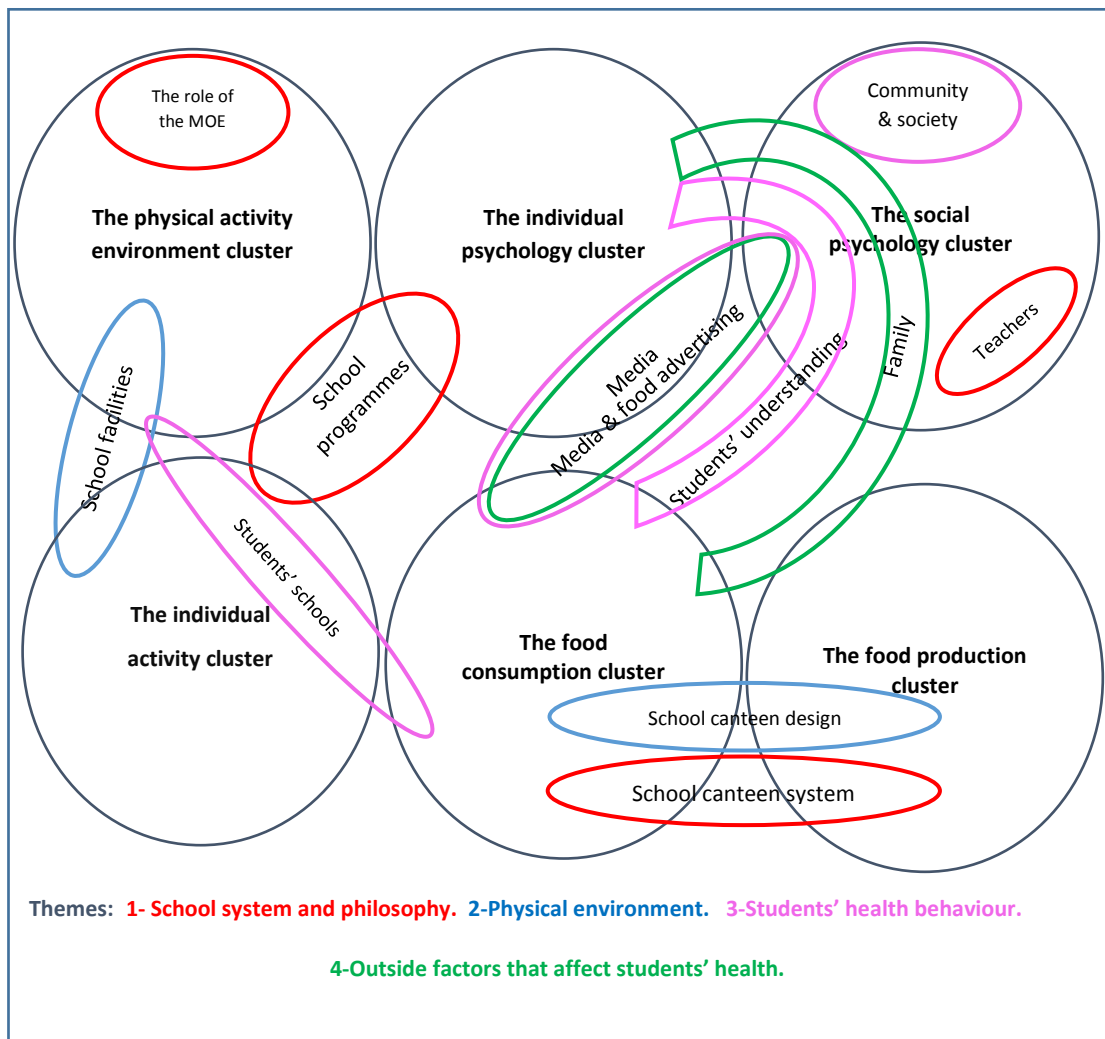
- Schools' policies and school environments to identify factors that could affect children's body weight.
- The teachers' and management's perspective in terms of any potential factors that could affect children's body weight.
- The current understanding of healthy food, lifestyle and obesity among boys in Saudi Arabia.

This chapter will be structured around these key objectives. The data for this thesis was generated from various sources, these included observation, interviewing teachers and students and review of documents. The findings of this thesis appeared in Chapters 5, 6, 7 and 8. Four themes appeared as major factors that affect children's body weight in Saudi primary schools: school system and philosophy; physical environment; students' health behaviour and outside factors that affect students' health. Within these themes, it was clear that many factors appear to affect body weight among boys in Saudi Arabia.

To understand the factors affecting body weight, the Obesity System Map, presented by the UK Foresight Obesity System Map, is the most comprehensive framework to date regarding the causes of obesity and its complexity (Butland et al., 2007). The Foresight Obesity System Map identifies seven themes regarding the causes of obesity,

these are the physiology cluster, the individual activity cluster, the physical activity environment cluster, the food consumption cluster, the food production cluster, the individual psychology cluster and the social psychology cluster. The physiological cluster was excluded, because it would have been difficult to get approval from the Ministry of Education in Saudi Arabia to investigate this aspect and it is beyond the scope of the present study. Therefore, I used the six remaining themes from the Foresight Obesity System Map. When I reached this point of the thesis, I chose to produce a Foresight Obesity System Map specific to Saudi Arabia schools to explore the findings of this study. Therefore, I drew the map and put the themes of the findings as the main focus on it. After meeting with the supervisors, we decided to put the foresight cluster as the main focus on the map; however, we kept the other themes on the map and gave each theme a colour. To understand how themes interact with clusters. At this point, I drew it again to match the foresight report and to understand the effects of these clusters on schools, as shown below.

FIGURE 9.1: Foresight Obesity System Map in Saudi Arabia Schools



The Foresight Obesity System Map in Saudi schools appears as a framework and guidance on obesity and its complexity. This shows that the food consumption cluster appeared in all themes, representing the strong effect of this cluster on the students' body weight. According to Butland et al., (2007), the food consumption cluster includes many characteristics of the food market and appears in schools, for example with regard to school canteen design, systems and policies.

I found that there were more than five ways to present this chapter, so my two supervisors and I discussed these and agreed that connecting the study's objectives with the findings was the best way to keep the work coherent. We decided to classify the cluster of the Foresight Obesity System Map on the thesis objectives based on the result of the Foresight

Obesity System Map in Saudi schools. Therefore, objective one involved three clusters: the food consumption cluster, the food production cluster and the physical activity cluster; the second objective included one cluster; the social psychology cluster; and the final objective included two clusters; the individual activity cluster and the individual psychology cluster.

This chapter reviews objective one, which was to explore schools' policies and environments to identify factors that could affect the body weight of children. Then, objective two, the perspectives of teachers and members of management, will be reviewed in terms of any potential factors that could affect children's body weight. Following that, objective three will be reviewed, this aims to explore the current understanding of healthy food, lifestyle and obesity among boys in Saudi Arabia. This chapter ends with a clear statement of the study's contribution to current knowledge and its recommendations.

Objective one: To explore schools' policies, environments and the government policies among schools to identify factors that can affect children's body weight.

Introduction

This objective was the main objective of this thesis. After data analyses in Chapters 5, 6, 7 and 8 and with a deep understanding of the data, I undertook further work to search in the documents and updated some which became available during the period of this thesis. Also, I started to search for updated documents to compare the findings with the current situation and explored school policies, environments and the government policies. The results of The Foresight Obesity System Map in Saudi schools showed that three clusters related to the first objective of this thesis: the food consumption cluster, the food production cluster and the physical activity environment cluster. The first and the second clusters appear in school

canteen design, the school canteen system and school canteen policies, while the third cluster appears in school facilities.

School canteen design

Many studies mentioned the importance of the role of schools in the prevention of childhood obesity (Della Torre Swiss et al., 2010; Story et al., 2006), particularly the role of school canteens. Therefore, Clarke et al. (2013) stated a need for schools, parents and government to work together to prevent childhood obesity. They suggested that both canteen food and canteen environments should be healthy and attract students (Clarke et al., 2013). However, the findings show that the public and Islamic school canteens are located outside the school building, meaning that it was difficult for students to reach them in all weather conditions. The Director of School Health at the Ministry of Education published a book entitled *The Standards and Requirements of Health for School Canteens* (Al-Shahri, 2013). This book clarified the responsibility of the Ministry of Education branches, school health and headteachers on school canteen; location, furniture and operation. It also provided a clear description of the school canteen standards, as quoted below.

The school canteen rules and requirements. First: The site of the school canteen building: School canteen must be located within the school walls. In safe place and accessible. School canteen should be close to the schoolyard and away from bathrooms. It should be in clean area not prone to contamination. It should be close to the large lounge or school umbrella in the courtyard or school playground. The place and its materials must be well designed to keep students safe.

(Al-Shahri, 2013)

The above quotation mentions the word 'safe' many times to emphasise the importance of students being safe when they eat their breakfast at school. However, in reality the school

canteens in the Islamic and public schools are in unsafe places. For example, when I walked from the private school to its canteen, I had no problem because I walked under a covered pathway, but when I walked in the public and Islamic school I found difficulties because the weather was very hot and windy. Therefore, students might not be able to get their daily breakfast and this affects a student's body weight.

Secondly, the findings show that school canteens were not designed as canteens, with the exception of the private school. For example, the capacity of school canteens is often very small, there are no cabinets in which to store food and there are no chairs or tables. This may lead students to eat quickly which may increase their body weight because eating quickly is associated with increased body weight (Ohkuma et al., 2015). Moreover, this is identical to what was stated in the book *The Standards and Requirements of Health for School Canteens*. The book did not mention that schools should have a large canteen to allow students to eat in them, as quoted below.

The canteen capacity and the number of windows to distribute food are commensurate with the density of the number of students at school. The number of windows will be not less than five windows in large schools. The canteen should allocate at least one seller for every hundred students. Taking into account the high sales outlets on the ground to be suitable for students

(Al-Shahri, 2013)

Moreover, the problem with the Islamic and the public schools was that the air conditioning was not sufficient to include the school canteen. This is also at variance with the contents of the Ministry of Education document, as quoted below.

Canteen must have good ventilation and lighting. It should have ventilators for ventilation and to extract fumes and hot air, with

adjustable air conditioners so as not to increase the temperature more than 25C degrees. School canteen must also put a trap insects, and fire extinguishers.

School canteen equipment and furniture: School canteens should have tables for food. These tables should be made from materials that can easily be cleaned. School canteen should have cabinets and shelves for keeping foods that do not need to be refrigerated and be elevated from the ground by a suitable distance of 30 cm or more.

(Al-Shahri, 2013)

Schools can make food environments more attractive to improve students' food consumption (Gosliner, 2014). According to Frerichs et al. (2016), a school's physical environment plays an important role in school food policies and practices, as it possibly limits the types of food the canteen can offer. Some canteens will not have sufficient cooking facilities or enough staff working in the canteen to cook fresh food every day. Often meals will therefore be ready meals or convenience food which are often less healthy and laden with calories. Daily consumption of this kind of food can lead to weight gain. Meals cooked on site with fresh ingredients are much more likely to be healthy.

However, students will continue suffering during their breakfast time because the school canteen design is inconvenient for eating. I observed the difficulties they faced in both the Islamic and the public schools, when they asked for food and then searched for a place to sit and eat.

School canteen system

The school canteen system is run by the Ministry of Education and headteachers. The Ministry of Education developed the school canteen standards and regulations, while

headteachers are responsible for implementing and evaluating them. The headteachers' responsibility begins when they sign the school canteen contract after evaluating the contractor's work. As mentioned earlier in this thesis, Saudi Arabia made moves to improve the education system by establishing the King Abdullah bin Abdulaziz Public Education Development Project (KAPEDP). According to the MOE (2016b) this project has had a number of funded projects to achieve its goals. One of these projects was to establish guidebooks setting out rules and regulations for schools and providing guidelines. These guidebooks gave clear direction and standardised procedures between schools, set out clear processes and responsibilities and removed the need for individual decisions. For example, KAPEDP published a book entitled *A guide to practice: For general education schools 2013-2014* (MOE, 2013a). This book included 27 school procedural processes and described how to conduct them in schools by distributing the responsibility between school staff members and the Ministry of Education branches; for example, teachers evaluate processes and school acceptance. This book included a guide to practice in school canteens, as quoted below.

The Ministry of Education will nominate the contractor name to the Headteachers. Then headteachers should contact the contractor to sign the school canteen contract on behalf of the Ministry of Education. Then, headteachers should keep the original contract, and give a copy to the contractor and send a copy to the Ministry of Education. After that, the headteacher should receive the school canteen budget from the contractor and keep it under school canteen committee.

If the headteacher finds that the company has violated the agreement or failed to maintain it, they have the right to execute penalty clauses which are written in the contract.

(MOE, 2013a)

The debate here is why contractors and headteachers signed contracts when the basic necessities in the Islamic and the public school canteens were absent; for example, there were no cabinets in which to keep food, no chairs or tables, and no space for eating. The Ministry of Education published a document entitled 'Terms and conditions of operation of the school canteen 2011-2012' (MOE, 2011). This document included the basic contract document, school canteens operation contract, rules and conditions for running school canteens and health requirements for school canteens. This document placed an obligation on contractors to prepare equipment and repair school canteens enabling the canteen to be run smoothly, as quoted below.

(1) The contractor should secure materials, equipment and workers and everything necessary for the implementation and completion of the work specified in the contract. The contractor should make the temporary and additional and complementary works and modifications which are mentioned by the Ministry of Education according to the contract.

(7) The contractor should renovate and improve the status of the current canteens commensurate with their purposes and in accordance with the requirements of health.

(MOE, 2011)

Returning to the debate of the way in which contractors and headteachers agreed to and signed contracts. There are two ways to resolve this debate: either they signed the contracts and agreed to accept the school canteen situation as it was and there was no need for any changes, or the headteachers asked the contractors to redesign the area and provide the school canteen with the basic needs. There is no problem when the contractor agrees to make the changes requested by the headteachers. However, as many participants mentioned, the position of headteachers in the above situation is weak; for example, the

contractor may refuse to apply the changes and thus refuse to sign the contract. If this happens headteachers need to contact the Ministry of Education to ask for their support or to nominate a new contractor. Moreover, the school might not attract many contractors for a number of reasons; for example, the contractor wants to make a profit and that depends on the school's capacity and also how far the school is from the contractor's resources. Both solutions require a lengthy process and sometimes headteachers have insufficient time to choose one of these two solutions. Therefore, the easiest way forward is to accept the current canteen situation. If they do so, students will continue suffering during their breakfast time, because the school canteen facility is inadequate and this can affect students' body weight.

When there is a clear compromise on the basics of school canteens between headteachers and contractors - for example, in the design of the school canteen and the availability of canteen materials - this might lead to more compromises in the quality of food. The Ministry of Education mentions many important issues related to food quality in the canteen contract, as quoted MOE (2011).

Food that is allowed in school canteens:

Normal milk packaged automatically from short or long-term, whole milk or low-fat milk or with flavours or iron-fortified milk.

Natural juices (100%) in non-glass packages, free of artificial colour and preservatives.

Hot drinks in general and specifically hot milk.

Food that is not allowed in school canteens:

All kinds of candy, chocolate and chewing gum and food that has low nutritional value including; different types of chips.

All kinds of soft drinks, energy drinks. Students should be prevented from bringing these to school.

No juices that have less than 30% natural juice content.

(MOE, 2011)

School canteens are considered to be a place to promote healthy food (Senior, 2012) and many studies recommend that school canteens provide healthy food, make it cheaper for students and reduce food types which are less healthy (Utter et al., 2007, Wyse et al., 2017, Muda et al., 2017). The evidence shows that school canteens can influence eating habits in children (Finch et al., 2006). Therefore, many countries have developed school canteen policies, for example Australia (Drummond and Sheppard, 2011), European Union, Norway and Switzerland (Storcksdieck, 2014) with the aim of improving the provision of healthy food in school canteens. There is an important call to change schools canteens' operational environment to focus on promoting students' health instead of increased profit (Cleland et al., 2004). A recent study by Drummond and Sheppard (2011) stated that when the responsibility for a school canteen belongs to the school, the school will provide healthy food. Therefore, schools should support their canteens through a school system for several reasons, for example, to support their students choosing healthy food; to link the school health curriculum with what is available in the school canteen; to educate students about healthy food and its benefits (Drummond and Sheppard, 2011). The findings show that all schools were using contractors, none of the school canteens sold fruit, the majority of foodstuffs were chocolate biscuits, cheese sandwiches and drinks with artificial colouring and that the types of food provided in the public and the Islamic school canteens was limited.

The second problem with the school canteen system is that teachers understand that school canteens are not their responsibility. It is the headteacher's responsibility and they cannot change the current situation. They know that there is a lack of continuing evaluation and

supervision of school canteens by headteachers and they know that with the lack of evaluation, contractors may engage in unhealthy practices with regard to food quality – as observed from the data this may affect students' health and their appetites because contractors put profit above food quality. The majority of teachers direct the responsibility for this to the headteachers first, and to students' families second, because they accept the low quality of food in school canteens and do not complain. Some participants mentioned that the contractors might need to be aware of healthy food and the importance of food to the children's growth and wellbeing. One participant recommended that the school employ a nutritional specialist who would evaluate and follow up on the food quality in the school canteen.

Another problem is in the setting of school canteen goals. Many of the participants, from all types of school, found that the school aim was to generate more money from the school canteen because it is the headteachers source of income for the school. Therefore, the products consist of what the students like, regardless of the quality of the food. As many participants mentioned, the headteachers try not to focus on food quality in order to maintain the canteen's income. Moreover, many participants mentioned that headteachers tried to do many things to increase school canteen income. For example, some headteachers tried to prevent students bringing their own food to the school in order to force them to buy from the school canteen. Moreover, some headteachers allow school canteen contractors to supply food that makes more profit, rather than healthy food. Thirdly, headteachers try to keep teachers away from the school canteen so they will not complain as this could affect the school canteen's income. One participant mentioned a very significant point, some headteachers might try to prevent teachers giving students lectures about healthy food because, as result of such lectures, students might not buy from the school canteen.

School canteen policies

The Ministry of Education established a headteacher's job description in 2011 and in 2016. The first version of a headteacher's job description included 52 items, while the most recent increased the numbers of items to 60 (MOE, 2016b). The aim of this document is to follow the government plan to move the Ministry of Education system from centralisation to decentralisation and to give more flexibility to school headteachers. For example, headteachers can now reward distinguished teachers. However, both versions mention that the school canteen is the headteacher's responsibility. In the most recent version, the school canteen system is mentioned in item number 47, as quoted below.

(47) Agreement with specialized sectors, which is accredited by the relevant government, to operate the school canteen.

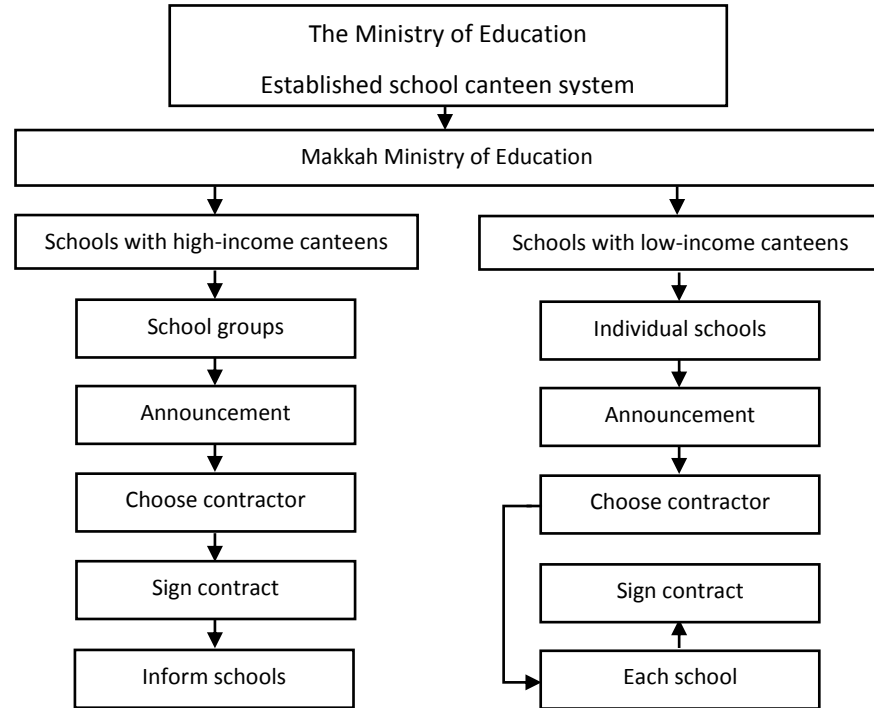
This authority is vested in the school fund committee.

- 1. School canteens are divided into two categories: The first category is the combined school canteens and the second category is the individual school canteens.*
- 2. The branch of the Ministry of Education should announce to the public the need to operate school canteens.*
- 3. When the committee receives applications, they should read it and decide which contractors to sign with, especially who is the most satisfying of the health requirements and the highest bid.*
- 4. The headteachers sign the contract with the school canteen contractor according to the model of the unified contract for the school canteens and send a copy thereof to the competent authority in the Department of Ministry of Education.*

(MOE, 2016b)

From the above quotation, bullet point number one mentioned two categories of school canteen, but it did not mention the details. Therefore, all schools will be classified depending on the Makkah Ministry of Education. From the data, the Makkah Ministry of Education categorises school canteens on the basis of income. Both the Islamic and the public schools are classified as schools with high-canteen incomes. This system will classify all school canteens as shown in Figure 9.2. The first classification will be schools with high-income canteens and the second classification will be schools with low-income canteens. As shown in Figure 9.2, the Makkah Ministry of Education classifies the schools into two categories depending on canteen incomes. Then they invite companies to apply for competition. After that they will choose contractors and they will sign the contract of the first category, they will ask each school from the second category to contact the contractors to sign with them. This is because they will receive the school's income for the first category under the name of the Makkah Ministry of Education, then they will distribute a certain percentage of school-canteen income between the schools in the same category, in the second category, the income will be under the name of each school, so each school its percentage and will send the rest of the money to the Makkah Ministry of Education. Gathering of high-income canteen schools into a large group or a smaller group will attract many contractors to apply for that category, and this increases a school's income. However, each individual school will not participate in the decision of choosing the contractor or signing the contract as these decisions may not reach the level of headteachers' expectations, but they will receive the school budget as determined by the Makkah Ministry of Education.

FIGURE 9.2: The system of schools canteen contract



The second category comprises schools with low-income canteens. The individual school canteen will face difficulty in attracting contractors to sign up because their canteens are classified as low-income benefits and headteachers may compromise from a high level of school canteen requirements to a low level so they can sign the school canteen contract.

Therefore, neither way supports headteachers to improve their school canteen. Headteachers of schools which are classified under the low-income canteen heading, because of student numbers, will accept low standards of school canteen requirements because they have limited choice of school contractors who want to sign the contract. On the other hand, schools which are classified as high-income school canteens have no choice when they want to change the current school canteen situation, because Makkah Ministry of Education signed the contract. From the findings it is clear that private school canteens are not involved in the above system, and the public and the Islamic school canteens come under the category of high-income school canteens. Findings from both schools showed that

there are many comments on food quality and canteen health requirements which can affect body weight among students at primary school. However, there are many good items mentioned in the above quotation. For example, bullet three mentioned health requirements as standard to evaluate the contractors and item four mentioned the contract model to protect schools rights.

Globally, many governments encourage healthy eating policies and they realise that the school setting is one of the best places to improve students' health (De Silva-Sanigorski et al., 2011). Therefore, globally many schools have created school canteen policies to support healthy food (Storcksdieck, 2014). For example, in 2014, the USA implemented "Smart Snacks" in schools, this requires all foods in schools to meet "Smart Snacks" nutrition standards (Datar and Nicosia, 2017). However, a study by Harris et al. (2016) concluded that the "Smart Snacks" improved the food quality in schools but many "Smart Snacks" in schools might not improve children's overall diet. Literature shows that schools try to make a profit from school canteens to support other goals within the same school (Drummond and Sheppard, 2011), which is similar to the results of this study. Much of the literature stated that parents need to create close links with the schools regarding decisions and extend their involvement with the schools in order to improve canteen food (Clarke et al., 2013). MacLellan et al. (2010) stated that inadequate communication with students and their families can be a barrier to successful school canteen policy.

School facilities

The results of The Foresight Obesity System Map in Saudi schools showed that school facilities can affect the physical activity environment cluster and this might affect the body weight of students, because school facilities may or may not encourage students to undertake physical exercise. A systematic review stated that improving access to physical activity facilities at schools can be an effective way to control obesity among children (Wang

et al., 2015). Therefore, a recent systematic review stressed the importance of identifying the environmental factors in schools that affect physical movement and increase sedentary behaviour to promote students' health (Morton et al., 2016). The findings show that schools differed in relation to their facilities. For example, the private school prioritised the design of its facilities, such as providing indoor and outdoor sports facilities. Moreover, the private schools understood the barrier to doing sports, so they had indoor sports facilities including gyms and swimming pools. In addition, the private schools encourage students to use school facilities outside school hours. Therefore, many studies recommend that the school environment can have a positive impact on students' physical activity (Ward et al., 2015; Gomes et al., 2014). When the school environment is appropriate and has a supportive school policy it encourages students to follow a healthy diet and promote their participation in physical exercise (Ward et al., 2015). School facilities in both Islamic and public schools were not given as much priority as those in the private schools. For example, there are often no gyms or swimming pools in these schools. Moreover, students cannot use the school facilities outside of school hours because at the end of the school day in the public schools as there is another school day starting in the same building; also, the Islamic schools have poor sports facilities. Also, both types of schools restrict physical activity inside the school lobby. A study by Alsaudi (2015) showed that the majority of Saudi parents are aware of the importance of school facilities for children's performance; therefore school facilities play an important role in parents' decisions when it comes to choosing their children's schools.

Summary

From the above, it can be seen that the physical activity environment cluster is affected by school facilities. Therefore, when a school has good sports facilities facilitated by the headteacher, students will have more opportunities to participate in physical activities. The second and the third clusters, which are the food consumption cluster and the food

production cluster, are also affected by school canteen design, the school canteen system and policies. The school canteen is one of the factors that can affect body weight in students in primary schools; for this, there are four pieces of evidence: school canteen locations, design, system and school canteen goals. School canteen locations and design are the responsibility of the Ministry of Education, while the school canteen system and goals are shared between the Ministry of Education and headteachers. The school canteen income will be divided between the Ministry of Education and the school. Schools will have a certain percentage of the school canteen income to spend on many school activities, such as student rewards and the school's closing ceremony for the academic year. Therefore, in both the Islamic and the public schools, there are many incentives for headteachers to maintain or increase the school canteen's income. However, there are many reasons for the school contractors to stop supplying food or fail to renew the contract with the school. The first reason is that the contractors are not satisfied with the income. The second reason is when a headteacher undertakes strong supervision or an evaluation of the school canteen and demands high quality, contractors are forced to spend more money on improving the situation. The main problem, which the data shows, is that the headteachers find it difficult to appoint a replacement contractor if the food supplies cease. Also, the data shows that headteachers might stop contractors supplying the school because the contract has been broken. When a school's food supplies cease, headteachers will face many problems, such as students complaining of hunger, families complaining that the school is irresponsible and the Ministry of Education blaming headteachers for not solving these problems. Therefore, as teachers report, the headteachers try to maintain the canteen's income and this affects food quality, the majority of teachers from all schools were unhappy with the quality and quantity of canteen food.

Objective Two: To explore teachers' and management perspectives in terms of any potential factors that could affect children's body weight.

Introduction

This is the second objective of this thesis; it explores teacher and management perspectives in terms of any potential factors that could affect children's body weight. This objective aimed to include teacher and management perspectives, but unfortunately there were difficulties accessing a management group, as mentioned earlier in the thesis. This is because the topic of the study is complicated and involves many departments, and managers were not happy to talk about other departments' responsibilities or were concerned about being recorded. Therefore, this study excludes the management level because of the difficulties in access; the findings for this objective are mainly from the teacher group. The results of The Foresight Obesity System Map in Saudi schools showed that there is one cluster related to the second objective of this thesis: the social psychology cluster. This includes teachers, family, community and society, and media.

Teachers

Data findings show that teachers play an important role in students' education. This role can, to some extent, affect students' body weight. The literature review shows that parents and stakeholders understand the difficulty for children to choose healthy food, so they suggested that teachers guide and support students to make healthy choices (Clarke et al., 2013). Data findings show that teachers play two important roles in regard to students' body weight, these are educating and advising students about their body weight. For example, teachers can improve students' health by educating them when they encounter health topics in the school curriculum. Moreover, the data shows that teachers play a role in guiding students to

better health through their advice to the students. This advice is often about healthy foods and various types of food in relation to body weight.

The teachers' role is considered to be an influential one in terms of the success of any programme that targets maintaining students' body weight (Rosário et al., 2012). Therefore, a systematic review recommends that teachers need good training programmes on how to deal with the families of obese children (Henderson et al., 2015). The findings included many factors that can affect a teacher's role in supporting students with regard to maintaining their body weight. The first factor is that teachers are committed to teaching the school curriculum and they have no authority to go beyond that. This means that teachers will educate students about the very limited health topics that are mentioned in the school curriculum. Hence, as the findings show, the teacher's self-motivation plays a major role here, because some teachers care about students' health so they engage with the students informally.

The second factor that can affect a teacher's role in supporting students with maintaining their body weight is the teacher's lack of health knowledge. The data highlights the importance of improving teachers' health knowledge so they can understand how to guide students towards maintaining a healthy body weight. Some teachers recognise the problem of students being overweight from different perspectives, such as family experience and a lack of adequate health knowledge. Therefore, the private school has established and supports a teacher development programme to keep teachers updated in their knowledge and skills to improve their performance.

The third factor, which is one of the interesting findings, was the varying role of sport teachers with students. Some teachers showed commitment in their role by guiding students and encouraging them to develop their physical exercises rather than playing football only during physical exercise lessons. Some teachers are satisfied when students wear sports

uniforms only during sport sessions and students opt out of physical exercise lessons as a group.

The fourth factor is teacher workload. This may be due to many factors such as a shortage of school staff, the huge number of students in each classroom and the diversity of teachers' responsibilities such as teaching and supervision. These responsibilities combined with a shortage of staff affect the teachers' productivity and that has an effect on student education and health. Therefore, the data findings show the importance of the students' health advisor at the school to cover the health issues arising among students. One of the interesting findings was related to the student health advisor's role of maintaining a healthy body weight among students. For example, student health advisors can have a positive influence on students' body weight by educating them on healthy food choices, and encouraging students to participate in physical activities inside and outside school. Many participants believe that getting students to start practising healthy behaviours at an early age is easier than changing unhealthy behaviour later on.

The fifth factor is lack of teamwork in health issues because one of the major elements that can affect a teacher's role in supporting students with regard to maintaining their body weight is the absence of teamwork. The data shows that no one person alone can help a student maintain their body weight, it is important to involve all the people around the student such as friends, teachers, families, media, health organisations, government and non-government sectors in order to achieve success.

Another interesting finding was that teachers believe that they gain experience as a result of the time they have spent in the school setting engaging with students and that they understand students in primary school better than those who work in other school levels or at the Ministry of Education. Because there is no direct connection with the Ministry of Education they tried to communicate recommendations through this study. Consequently

they asked to be consulted in any decisions for students in order to make a success of school programmes. Teachers play an important role in shaping children's lives. Therefore, during the Weight Bias Summit in 2015 many experts on obesity mentioned a need to train teachers about obesity and weight-related issues. For example, teachers should know how to measure body weight and how to calculate the BMI. Additionally, teachers should develop successful ways to reduce weight and be given the resources to support their role, such as books (CON, 2015).

Family, community and society

Children's families, the community and society play an important role in a child's health. Families are one of the groups that have an influence on children's body weight (Zeller et al., 2016) and many Saudi studies show that Saudi families have an effect on children's health. For example, a study by Abalkhail (2002) mentioned that many Saudi families provide their children with computer games without controlling the time they are used so children will spend many hours playing. Another example is the study by Amin and Al-Abad (2008), which conclude that lack of Saudi parental guidance was one of the risk factors for children's health problems. Clarke et al. (2013) stated that many studies emphasized the importance of communication and working together between schools and parents to improve healthy nutrition among students. A systematic review by Kornet-van der Aa et al. (2017) found that parents play an important role in helping their children follow a healthy lifestyle. Another systematic review stated the importance of family involvement in childhood obesity prevention programmes (Wang et al., 2015). However, data shows that not all families are the same. For example, some families pay attention to their children's health and some families do not. Therefore, families could have a negative impact on children's health for many reasons such as the low levels of family awareness, responsibility and education. For example, with many obese children their parents are unaware of their unhealthy condition

(Twarog et al., 2016). Another example from the findings is that some families were afraid that their children would be hungry so they tried to offer any type of food because they wanted to avoid this. The data findings show that there is a lack of communication between teachers and students' families. Although, it is good to develop insight in parents about the increase in body weight among their children (Schwartz, 2015). However, the teachers expressed their need for parents' cooperation so both can work together to support students in aspects such as increasing families' awareness, how to choose healthy foods and maintain healthy body weight.

It was obvious that families have no connection with the school canteens and no appreciation of the availability of healthy food. However, there are many positive benefits that children can gain from their families. For example, families sometimes educate their children about obesity and health issues. Therefore, the data emphasises the importance of increasing family awareness to control children's body weight through changing unhealthy family eating habits at home, making healthy food for children the top priority of the family, knowing their responsibility, such as buying and cooking healthy food at home and working as a team with schools to maintain children's body weight. The community plays an important role in the success of obesity management (Tremblay and Lachance, 2017). Traditionally, Saudi families have a strong influence on children's diet because they eat together on a daily basis; therefore, children will eat two to three main meals daily (Al-Rethaiaa et al., 2010). According to Washi and Ageib (2010) traditional Saudi food is considered to have a high fibre content and low fat. However, Saudi families have replaced many traditional foods with fast food (Al Othaimeen et al., 2007). This is for a number of reasons, such as marketing practices and easy access to take-away food or no time available for cooking at home (El-Hazmi and Warsy, 2002a). Therefore, the community and broader society can be factors that affect students' health. The data findings show that the community and society judge students regarding their body weight and this may lead the

students to change their health beliefs and behaviours. Moreover, some children use the word 'obese' to insult people in the community.

Therefore, the data shows the importance of community and society in maintaining children's healthy body weight. Community and society awareness helps students to maintain their healthy body weight. Therefore, any education programme should include the community and society responsibilities and their role in supporting children to keep them healthy. A peer-reviewed study recommended that social influence can help in childhood obesity management (Jalali et al., 2016). Through a review of the literature Clarke et al. (2013) indicated the importance of family, community and society's role regarding students' health and they stated that health education at school requires family and community support. On the other hand, a study by Tremblay and Lachance (2017) found that school is an important environment to promote a healthy lifestyle in the community. Therefore, schools should work side by side with families and the community to protect children from obesity because people need to be aware of their responsibilities in regard to protecting children from obesity (Lederer et al., 2015).

Media

The findings show that students are very connected to television, games and social media. Many studies stated that children who watch television for more than an hour a day may become obese over time (Peck et al., 2015, Katzmarzyk et al., 2015). Alghadir et al. (2015) concluded that the extent of television viewing was higher among Saudi children because there is more than one television screen in Saudi homes. This also affects children's health because they continue watching television at night (BaHammam et al., 2006). A recent cross sectional study in Jeddah by Mortada et al. (2016) showed that 32.7% of 407 children aged between 2 to 17 years old were playing video games for more than four hours daily. Another cross sectional survey in Riyadh showed that 68.3% of 357 Saudi children aged between 10

to 16 years old spent more than two hours daily on playing games and watching TV. The American Academy of Pediatrics has recommended limiting total media time daily and taking televisions out of children's bedrooms (Patriarca et al., 2009). Moreover, a systematic review found that media can have an impact on children's preferences immediately or after exposure to food advertisements (Sadeghirad et al., 2016).

The data shows that students enjoy the games, stories, activities and programmes that they engage with; however, few active video games can help children to reduce sedentary behaviour (Gao et al., 2015). Television and social media become important sources of knowledge for students. However, the data findings show that the role of media in health is limited. The main issue, from findings, is that the media has a strong influence on children's health knowledge and behaviour. Moreover, the media attracts and targets children through advertising food products and companies influence them to choose their food ranges. Moreover, data findings show that recently many fast food restaurants have designed special advertisements for children's meals and make the restaurant environment attractive to children. Therefore, students' awareness should be raised through media so that children will recognise the effect of unhealthy food on their body. Moreover, the government should establish food policies for children, to control the advertising of unhealthy food in order to protect children.

Summary

It can be seen that the social psychology cluster is affected by school teachers, family, community, society and media. There is much evidence to show that teachers have an important role in student health. Therefore, schools should pay more attention to them, this can be achieved by increasing their health awareness, removing any barriers that affect their roles such as adding healthy topics to the school curriculum to help them in their teaching, and decreasing their workload and motivating them to work together to reach healthy goals.

Schools should involve family and community as part of the drive to achieve healthy goals for their students. This can be done in many ways such as educating family and community to increase their awareness of health topics, asking them to help and participate in school health plans and decision making so that they are supportive. Media has a strong influence on children and can be a useful tool to help children develop an awareness of health issues such as understanding healthy food, understanding the effect of unhealthy food on the body and how to maintain a healthy body weight.

Objective Three: To explore the current understanding of healthy food, lifestyle and obesity among boys in Saudi Arabia.

Introduction

This was the third objective of this thesis. Dealing with students in primary schools was a good experience for me, even though I have five children. I noticed a number of things, such as many students enjoyed liking to me in front of their peers, listening to me talk about a facts without controversy, sharing some family names with me of those who work at my university. However, there were many students who ignored my presence, this did not bother me because I understood their situation. During my observations, I sat with students from different grades in schools, but when it came to the interviews I chose to sit with students from grade six because they have good communication skills and were able to assist my understanding. The results of The Foresight Obesity System Map in Saudi schools showed that there are two clusters related to the third objective of this thesis: the individual psychology cluster and the individual activity cluster. Students' understanding of preferences can be affected by school philosophies, school curricula and school programmes.

Students' understanding preference

Students' understanding of health issues such as the difference between healthy and unhealthy food, the advantages and disadvantages of healthy and unhealthy food on health, and the importance of physical activity is very important because understanding these issues can help them to make the right decision (Tarabashkina et al., 2016). For example, the data show that the taste of food has a strong influence on children and their choice of food. Therefore, children will choose to eat what is tastiest first and will not consider the harm or health benefits too much because they are still children. However, from the findings, many factors increase the possibility of this factor. For example, students' understanding of

preference can be affected by many factors such as the school philosophy on health, the limitation of health topics in the school curriculum and school programmes.

School philosophy

As mentioned earlier in this thesis, the Ministry of Education established nine aims for the Saudi Arabian primary schools. Despite the fact that the primary school aims to cover many aspects, these aims do not mention any health promotion. Therefore, the findings show that the absence of students' health in the list of school aims does not support schools or encourage them to improve student health. This stands as a factor that affects students' understanding of healthy food and obesity at the primary school. As result of that, the data shows no health education plan, weak school health support and a limited number of health education programmes. All this is because the Ministry of Education did not make students' health a school priority. A systematic review shows that schools are an important setting in the control of obesity among children (Wang et al., 2015). Therefore, schools need to pay more attention to both physical activity and diet to protect students from obesity (Farmer et al., 2017). However, the findings show that there is no strategic health plan between the Ministry of Education and the Ministry of Health to improve students' health understanding. However, the data reveals that there is a reflective health plan in place, for example, school vaccinations and the presence of health crisis brochures.

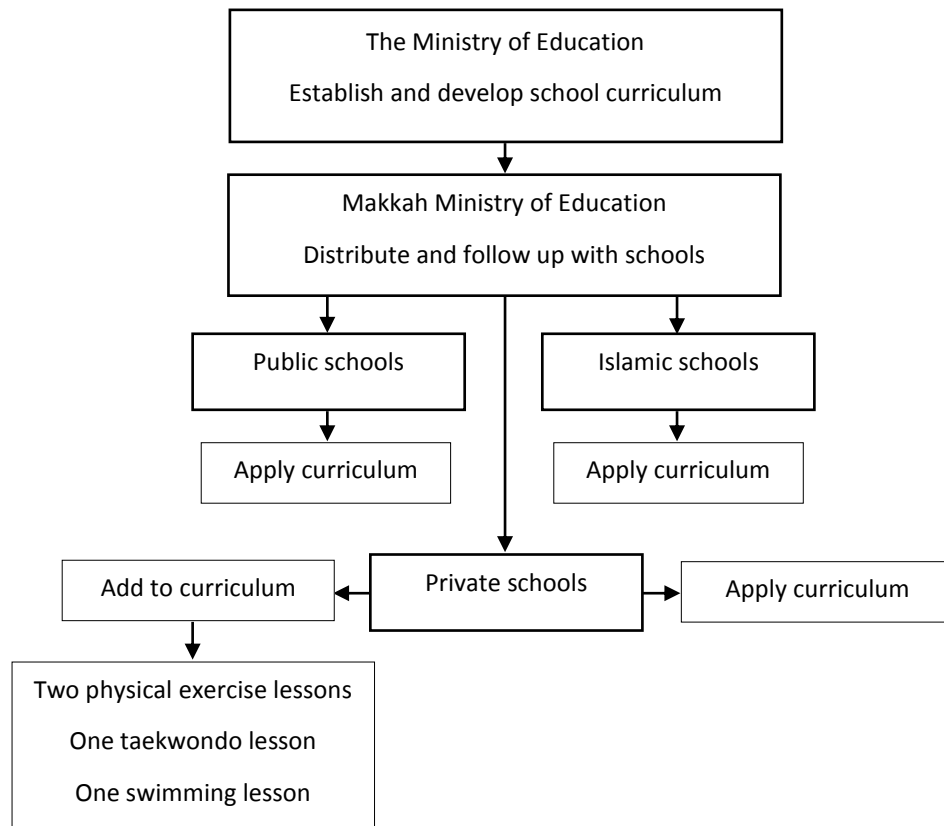
School curriculum

The literature review shows that schools use many methods to improve students' health education such as improving the school curriculum (Clarke et al., 2013). According to Carter and Swinburn, (2004) the school curriculum is an important way of providing students with healthy messages, the context of these messages should be selected carefully because the school curriculum can affect the health of students. However, the school curriculum is the second factor that affects students' awareness of healthy food and obesity in Saudi primary

schools. The findings show many issues on the school curriculum. It appears that a message that comes from the school curriculum direct to the students is more effective. However, findings show that the school curriculum is a factor that can affect body weight among students at primary school. For example, the school curriculum had very limited topics about health, and no topic on how to maintain body weight.

The school curriculum can open many opportunities to enhance teachers' interventions regarding healthy food and physical exercise in school (Sutherland et al., 2004). Therefore, the absence of health topics, such as obesity and maintaining body weight in the school curriculum, leads to many important issues. The first one is limitation of students' understanding of their body weight. Secondly, the absence of health topics stands as a barrier to schools because a school has no right to invite a health organisation from government or nongovernment to participate in maintaining body weight programmes and to give lectures on obesity if these are not on the school curriculum. Thirdly, the teachers have no right to teach students topics that are not included in the school curriculum. The Ministry of Education in Saudi Arabia is responsible for developing the school curriculum. They established the school curriculum and distributed it to the regions, as shown in Figure 9.3.

FIGURE 9.3: The system of school curriculum



The Makkah Ministry of Education sends the school curriculum to all schools in the region to use as a guideline. However, private schools add some subjects to its curriculum, as shown in above Figure 9.3. Therefore, the private school has nine lessons daily which is more than in the public and Islamic school as shown earlier in this thesis.

School programmes

School programmes can help students in primary schools to understand healthy food and obesity. More than that, some school programmes encourage students to improve healthy behaviour. For example, The Dates and Milk Day programme was funded by the Ministry of Education to improve students' dietary habits; however, three years later this project ceased. Some school programmes offer many health benefits to the students. For example, increasing students' understanding and improving their health behaviour. However, these programmes face issues of sustainability. Therefore, some of the programmes need to be re-

evaluated, and some need to be supported to enable them to continue helping and supporting students to understand and improve their health. Globally, there are so many health programmes that can easily be implemented in schools, an example of this is the programme called 'Values Initiative Teaching About Lifestyle' which is a mix of health education and physical exercise. This study concluded that the programme was effective, inexpensive and acceptable to children (Manger et al., 2012). Schools are an important part in any child's health plan, therefore in the UK by September this year the government will introduce a health-rating scheme based on scientific evidence for schools (Government, 2016). The aim of the scheme is to support students in primary school to realise and encourage their impact in tackling obesity through healthy eating and doing more exercise, the government will reward schools according to students' achievements. However, the Canadian Obesity Network held the Weight Bias Summit in 2015 where many obesity stakeholders such as health professionals, researchers and experts emphasised that school programmes require partnership with parents if they are to succeed (CON, 2015).

Recently the Saudi Arabian government has strongly supported Saudi Arabia's Vision 2030. According to Saudi Vision-2030 (2017) the vision identifies many policies, goals, and objectives of the country which they hope to reach by 2030. In Saudi Arabia's Vision 2030, the Ministry of Health (MOH) set many objectives and one of these objectives is to improve public health services with a focus on obesity and smoking. Therefore, the MOH and the MOE in Saudi Arabia established an initiative to reduce obesity among school students. According to the MOH (2017) the initiative is called Rashaga and the general aim of this initiative is to promote health lifestyle, food habits and physical activities, while the specific aim is to reduce obesity prevalence by 5% in selected schools by 2020. This initiative is supported by two food companies, and it will be in two stages. The first stage will target six regions and a thousand students, and the second stage will target all regions and up to 6.000 schools. This initiative is targeted at students in primary schools; however, it has many limitations: firstly,

the total number of students enrolled is limited; secondly, the aim to reduce obesity prevalence by 5% in selected schools is a very limited aim; thirdly, the role of the food companies, which support this initiative, is not clear.

One of the interesting findings was that teachers believe that they gain experience from contact with students over many years and that they understand students in primary school better than those who work in other school levels or at the Ministry of Education. Because there is no direct connection with the Ministry of Education they attempted to communicate a number of recommendations as an effective way to change students' health behaviour. For example, students in primary schools need something to attract their attention and to send effective messages to them, there are many ways to do this. For example, using cartoons or other famous children's films to present a film of students of the same age; to produce a film from real life; to use prizes to encourage student participation; and to use games that are most popular within the children's communities.

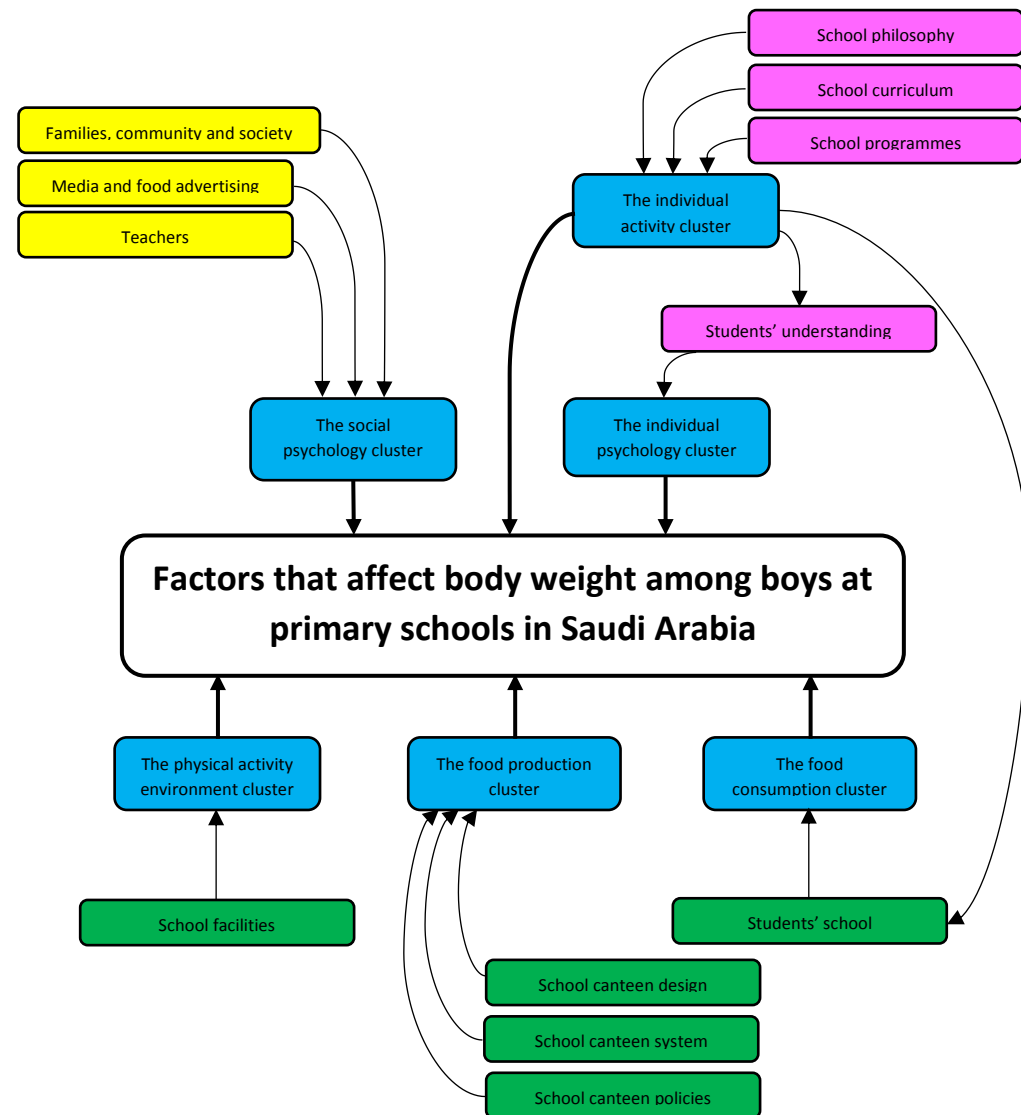
Summary

It can be seen that students' understanding of preference is situated in the individual psychology cluster. The students' understanding of preference can be affected by many factors such as school philosophy, curriculum and programme. All these factors are situated within the individual activity cluster, this means that the individual psychology cluster can be affected by the individual activity cluster. So, the school as a whole can affect students' understanding of health and health behaviour. Therefore, when the Ministry of Education wants to implement a health promotion plan for students in schools, it must take a holistic approach in order to achieve success.

Conclusion

At the beginning of this chapter, I decided to draw a Foresight Obesity System Map specific to Saudi Arabian schools to understand the effects of clusters on schools. At this point, I decided to match the Foresight report with the study objectives, which were to explore schools' policies and environments to identify factors that could affect the body weight of children. The second objective was the perspectives of teachers in terms of any potential factors that could affect children's body weight and the third objective was to explore the current understanding of healthy food, lifestyle and obesity among boys in Saudi Arabia. So, I drew the Foresight Obesity System Map specific to Saudi Arabian schools for a third time to match the foresight report with the study to understand the effects of these clusters on students' body weight, as shown in FIGURE 9.4.

FIGURE 9.4: Factors that affect body weight among boys at primary schools in Saudi Arabia



■ The factors that affect objective one

■ The factors that affect objective two

■ The factors that affect objective three

In the above figure, the factors that affect objective one of this thesis are in green while the factors that affect objective two are in yellow and the factors that affect objective three of this thesis are in pink. From the above figure, it is obvious that the individual activity cluster has not only a direct effect on students' body weight but it can also affect two clusters, which are the individual psychology cluster and the food consumption cluster. That means that

school philosophy, curriculum and programmes are very important factors because they affect three clusters; the individual activity cluster, the individual psychology cluster and the food consumption cluster, all of which can affect students' body weight.

The contribution to knowledge

The aim of this study was to explore each of the three types of school (public schools, Islamic schools and private schools) in Saudi Arabia in terms of the factors that can affect body weight among boys in the country. This study has many distinct issues which should be mentioned here:

1. This is the first study that used Foresight Tackling Obesities: Future Choices as a framework and as a source of guidance on children's obesity and its complexity in schools.
2. It is the first study to examine the current situation of the school environment in relation to the factors that can affect students' body weight among boys at primary schools in Saudi Arabia in general and specifically in Islamic schools.
3. It is the first study to explore and compare the three types of school - public, Islamic and private - in terms of factors that can affect body weight among Saudi children.
4. It is the first study to use qualitative observations as a research methodology to explore factors affecting students' body weight in primary school in Saudi Arabia.

Therefore, this study can be considered as a baseline study when trying to understand the factors that can affect students' body weight in primary schools in Saudi Arabia. The majority of previous studies in the literature examined the prevalence of child obesity in Saudi Arabia. New knowledge and contributions to present knowledge were presented in each of the four findings chapters, which looked at school system and philosophy, physical environment, students' health behaviour and the outside factors that affect students' health.

This study has highlighted some novel findings which tell us about the link between the way schools are regulated and managed in Saudi Arabia and the health of young children attending those schools.

In the school system and philosophy chapter, it was clear that the Ministry of Education has the power for control and change. This creates a great burden when it comes to changing school health for the better. Therefore, the Ministry of Education should distribute some of its authority and reduce central control over school decisions, leaving space for each school to draw up its own health policies based on their students' health needs. Schools need to make students' health one of their top priorities. This will require schools to address school health issues, such as individual students' health needs. They will have to implement school canteen standards, improve the school environment and ensure that students get involved in physical exercise. It is also important to identify teachers' and headteachers' responsibilities regarding all health issues within schools. When schools are given the power to change, this must include school budgets to ensure that students have a healthy school environment. Some of the findings mentioned in the chapter on physical environment will continue to present barriers to improving students' health. Nevertheless, with the power to change and independent budgets, schools can change the health situation for the better, for example by redesigning school canteens and enhancing physical activity, by developing the existing sports facilities and building new ones.

The chapter on students' health behaviour shows the importance of understanding students' preferences in primary schools and the impact of society, schools and media advertising on their health. Things can best be understood through a great deal of research and teachers' feedback and by establishing health standards to deal with students' health issues inside schools. The effect of outside factors such as the media and family on students' body weight has to be considered.

Implications of the study

The findings of this study suggest many recommendations for the Ministry of Education's policy and practice and for research. They also present an opportunity to develop initiatives to control student obesity.

Implications for policy and practice

The findings of this study suggest many recommendations for the Ministry of Education's policy and practice, in Saudi Arabia:

1. There is a demand for change in school philosophy, curriculum and programmes to target students' health, specifically how to educate children in the areas of body weight, obesity, nutrition, food groups and a healthy diet. Also, there is a need to establish a student health care plan at schools, for any health plan to succeed this study recommend increasing health awareness among students, teachers and family.
2. This study recommend giving schools more authority to improve students' health. For example, schools need more authority to start their own health programmes depending on needs, and schools need support to ensure the sustainability of these programmes. Another example is that schools need more flexibility to invite health organisations to give lectures and to participate in any school health events
3. This study recommends a re-evaluation of the school canteen system, design, contracts and policies so that they are supportive to students' health requirements. Also this study found that there is a gap between what was written in the Ministry of Education standards for school canteens and the real situation relating to school canteen location and design. Therefore, this study recommends a re-evaluation of the current situation with new schools built to bridge this gap.

4. This study found that more action is needed to maintain students' health. Therefore, this study recommends health professionals in schools to follow up and record the students' health situation. For example, students' body weight should be recorded to help identify students who have health issues.

Initiative to control student obesity.

Throughout this thesis, the complexities of obesity among children were clear. It was also clear that people had already made an effort to control the rise in obesity rates. However, obesity rates are still increasing. The main reason for this is the sheer number of factors which can affect children's body weight. The literature stated that no person or organisation alone can stop the prevalence of obesity. Moreover, no single action can solve the problem. The Canadian and American Medical Associations have recently stated that obesity is a chronic medical disease. Saudi Arabia needs to have a comprehensive initiative to control obesity among students. Therefore, this thesis calls upon the highest levels of Saudi government to adopt this initiative. The initiative has four phases. The first phase is the government's approval and support through financing and manpower. Second, the government will set up a committee to determine all the factors that affect children's body weight and put a plan into action. The third phase is to distribute tasks to different government sectors such as the Ministry of Education, the Ministry of Health, the Ministry of Information, the Ministry of Commerce, the Ministry of the Interior, the Ministry of Municipalities and Rural Affairs, and nongovernment sectors such as private schools, hospitals, food marketing and media, to work to reduce these factors. The last stage is to evaluate each intervention and the outcome of this initiative.

Implications for future research

Drawing on the findings from this study, it is apparent that there is a demand for further research focusing on various factors that increase obesity among Saudi children. For

example, the need to evaluate the presence of health topics in the school curriculum, and how the curriculum can help students understand healthy food and how to maintain their body weight. The second example is to explore the reasons for poor communication between schools and students' families in relation to school canteens and healthy food, and how that affects the students' food habits. The third example is to explore the food types in school canteens to determine how they can comply with school canteen standards.

My future research

Although I had planned to publish one or two articles from my thesis before the final submission, unfortunately, it proved difficult to find sufficient time to achieve that. However, the current plan is to publish five articles. Therefore, I developed my own strategy for publication. The general aim is to publish some of the thesis chapters to respected journals in order to share the findings with other researchers in the field. To achieve this goal I suggested many titles and journals to my two supervisors in order to gain their advice and support to publish this work:

- 1- A case study of factors affecting body weight in the public primary school boys, Makkah, Saudi Arabia.
- 2- A case study of factors affecting body weight in the Islamic primary school boys, Makkah, Saudi Arabia.
- 3- A case study of factors affecting body weight in the private primary school boys, Makkah, Saudi Arabia.
- 4- Literature review of factors affecting body weight in Saudi Arabia.
- 5- Factors affecting body weight in boys in primary school, Makkah, Saudi Arabia: A comparative case study.

Choosing journals in which to publish articles is the difficult part; however, after a long search I decided to publish in three journals. The first is Saudi Journal for Health Sciences, I chose

this for two reasons. The first reason is that the journal is issued by Taif University, which is the one that gave me the scholarship. Therefore, it is good to support them, and the second reason is because it is a health journal and it is good to make access for further publication. The second journal should be in the field of obesity for example BioMed Central (BMC) Obesity. BMC Obesity is an open peer-reviewed journal and considers articles on the causes and effects of obesity. The third journal should be in the field of school health, for example the Journal of School Health which is issued by Wiley with the impact factor: 1.547. This strategy should start immediately after the final submission of the thesis.

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Appendixes:

Appendix I: Access approved by Ministry of Education in Makkah.

<p>إدارة التخطيط والتطوير التربوي</p> <p>الرقم: ٣٥١١٥٨٦٩٢</p> <p>التاريخ: ١٤٣٥/٠٦/١٦</p> <p>المرقات:</p>	<p>بسم الله الرحمن الرحيم</p>  <p>بإذن المديرية العامة للتعليم</p>	<p>المملكة العربية السعودية</p> <p>وزارة التربية والتعليم</p> <p>(٢٨٠)</p> <p>الإدارة العامة</p> <p>للتربية والتعليم بمنطقة مكة المكرمة</p> <p>إدارة التخطيط والتطوير</p>
<hr/>		
<p>الموضوع / الموافقة على إجراء مقابلة ميدانية</p>		
<hr/>		
<p>سعادة الملحق الثقافي السعودي بالندن</p> <p>وفقه الله</p> <p>السلام عليكم ورحمة الله وبركاته ... وبعد</p> <p>فيناءً على الاستدعاء المقدم من الباحث / أحمد بن صالح الكراني الغامدي السجل المدني رقم (١٠٤٢٨٤٤١٢٤) ، بخطابه ذي الرقم: (بدون) وتاريخ ١٤٣٥/٠٦/١٦ هـ والمتضمن رغبته في الحصول على إفادة بمدى موافقتنا على تطبيق دراسته المعنونة ب: ((إدراك الأطفال في المملكة العربية السعودية لمفاهيم وزن الجسم)) : عليه نفيدكم بأنه ليس لدينا مانع في إجراء هذه المقابلة اعتباراً من تاريخ: ١٤٣٥/١١/٠٥ هـ الموافق: ٢٠١٤/٠٨/٣١ م.</p> <p>والسلام عليكم ورحمة الله وبركاته.</p>		
<hr/>		
<p>مدير عام</p> <p>التربية والتعليم بمنطقة مكة المكرمة</p> <p>حامد بن جابر السلمي</p>		
<hr/>		
<p>هاتف مباحث: ٠١٢/٥٥٨٠٨٨٩ - فاكس: ٠١٢/٥٥٠١٨٨٩ - التحويلات الداخلية: (١٤١١-١٤١٠-١٤٠٩-١٤٠٨) البريد الإلكتروني: Takmakkah@hotmail.com موقع الإدارة: www.makkahedu.gov.sa</p>		

Appendix II: School Announcements (big poster)



DEAR PARENTS OF STUDENTS IN GRADE (6)

We are glad to inform all parents that our school has been chosen from Makkah Ministry of Education to implement research titled, “Factors affecting body weight in boys in grade 6 in Makkah, Saudi Arabia” collaboration with Cardiff University, UK by the researcher Mr Ahmed Alghamdi

When: come and join the parents meeting on..... at, and feel free to contact the researcher.

Where: At our school

Why and How: We will send a letter with your child to give you more detail.

Who: Students from grade 6

For more information you can contact the researcher:

In Saudi Arabia: mobile: 0554588440 , Email: asakg@live.com.

In UK: School of Healthcare studies, Cardiff University, 35-43 Newport Road, CF24 0AB, Tel: +44 (0) 2920917727. Email: AlghamdiA7@cf.ac.uk

Thank you for your consideration,

Appendix III: Parent Information Sheet and Consent Form

Dear parents of students in grade 6:

- I am Ahmed Alghamdi, working as a lecturer at Taif University. I am enrolled on Doctorate in Philosophy (PhD) programme at Cardiff University in Wales, United Kingdom.
- As a part of my postgraduate study I am conducting a research entitled “Factors affecting body weight in boys in grade 6 in Makkah, Saudi Arabia: A comparative case study” and I would like to invite your child in grade 6 to participate in this study.
- The aim of this study is to explore each of the three types of school (public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia.
- Please take time to read the following information and please do not hesitate to call me for more clarification and information before you make your decision on 0554588440 or send an e-mail to asakg@live.com.

Yours Sincerely,

Ahmed Saleh Alghamdi

What is the purpose of the study?

- The aim of this study is to explore each of the three types of school (public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia.

Why has our child been chosen?

- Your child is not the only one who is invited to participate in this study; all students in grade six in the school have been chosen to take part in this research.

What happens if we say No?

- You and your child have the right to say No now or at any time during the study without giving any reason.

What will happen to our child if we say Yes?

- The researcher will arrange a suitable meeting within school time to conduct semi-structured interviews with your child.
- The researcher has developed a children's pamphlet to include writing and drawing techniques to encourage children to participate during the interview, and your child has the right to answer all or decide not to answer the questions.
- The interview time would be between 30 minutes and one hour in duration and the researcher will ensure that the time does not affect the child's progress.
- The researcher will maintain the privacy, safety and confidentiality during the period of the interview.
- The interview with the child will be in a quiet room and will be recorded, which will then be transcribed.
- This study may ask permission to re-interview your child to gain more information on the study.

What will happen to our child's information?

- The researcher will maintain all of your child's information including audio files under confidential conditions and in accordance with UK data protection policy.
- This study will not identify your child by his name.
- The researcher will keep all information gathered confidentially, and no one will have access to it except the researcher.
- Direct anonymous quotes may then be used for research and academic purposes, and the results of this study may be presented at conferences and published in scientific journals.

What are the benefits of taking part?

- Taking part in this study is voluntary, and taking part may not benefit you personally but the information we gain may help other children in the future.

What are the potential risks associated with this study?

- There will be no harm or costs to your child as a result of taking part in this study.
- For further questions about the research process please do not hesitate to contact the researcher through his contact details below at any time of day.

Who is organising this study?

- The study is being organized by the Department of Nursing, School of Healthcare Sciences, at Cardiff University. The study will be run by the main researcher Ahmed Alghamdi in collaboration with Ministry of Education at Makkah Region.

Who has reviewed this study?

- This study has been reviewed by:
 - The School of Healthcare Sciences Ethical Committee on 16/09/2014.
 - The Research Review and Ethics Screening Committee (RRESC) on 04/06/2014.

Who we should contact for further information?

- Please do not hesitate to contact us for more information, we appreciate that at:
 - Researcher: Ahmed Saleh Alghamdi
Mobile number: 0554588440
Email: asakg@live.com
 - Supervisor: Dr Ben Hannigan
Cardiff School of Healthcare Sciences,
Email: hanniganb@cf.ac.uk
Telephone: +44 2920917726

Thank you for taking the time to read this information!

Parental Consent Form

Title of research: Factors affecting body weight in boys in grade 6 in Makkah, Saudi Arabia.

Name of researcher: Ahmed Saleh Alghamdi

Please initialbox

I confirm that I have read and understand the information sheet, version 3 dated 02-04-2015, for the above study and have had the opportunity to ask questions and to have these questions answered.	<input type="checkbox"/>
I fully understand that my child's participation is voluntary with free withdrawal at any time without giving any reason.	<input type="checkbox"/>
I fully understand that my child's participation is anonymised.	<input type="checkbox"/>
I fully understand that data collected may be used anonymously for; presentation in the final research report, publication in journals, presentations at conferences and other academic purposes.	<input type="checkbox"/>
I agree that my son can participate in the above study.	<input type="checkbox"/>
I do Not give permission for my son to participate in the above study	<input type="checkbox"/>

Child's full name:..... Grade 6

Name of person giving authorisation:

Full Name:.....the relation to the child.....

Signature.....Date.....

Person collecting consent:

Name:.....Signature.....Date.....

Copies:

1 for volunteer, 1 for researcher, 1 to be kept in the school

Appendix IV: Child Information Sheet and Consent Form

Child information sheet for children to be read by parents:

We would like to invite you to participate in our study at your school, so please have a look to this sheet and understand it before you decide to say Yes or No.

What is the study about?

- We want to explore each of the three types of school (public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia.

Why have they chosen me?

- We have chosen all students in your grade at your school to take part in this research.

What happens if I say No?

- You have the right to say No now or at any time during the study without giving any reason.

What will happen if I say Yes?

- Mr Ahmed Alghamdi will sit with you at your school and he will give you a pamphlet.
- He will ask you many questions and you can answer them by talking to him or writing or drawing on the pamphlet and you have the right to answer all or part of the questions.
- The interview with you will be in a quiet room and will be recorded.
- This study may re-interview to gain more information on the study.

What are the benefits of taking part?

- Taking part in this study is voluntary, and taking part may not benefit you personally but the information that we gain may help other children in the future.

Do I have to take part?

- No, not if you don't want to.
- If you say yes then you decide to leave that is fine, it is up to you.

Thank you for taking the time to read this information!

Child Consent Form

Title of research: Factors affecting body weight in boys in grade 6 in Makkah, Saudi Arabia.

Name of researcher: Ahmed Saleh Alghamdi

Please initial box

I confirm that I have read and understand the information sheet, version 3 dated 02-04-2015, for the above study and have had the opportunity to ask questions and to have these questions answered.	<input style="width: 40px; height: 30px;" type="checkbox"/>
I understand that my participation is voluntary with free withdrawal at any time without giving any reason.	<input style="width: 40px; height: 30px;" type="checkbox"/>
I understand that data collected may be used anonymously for; presentation in the final research report, publication in journals, presentations at conferences and other academic purposes.	<input style="width: 40px; height: 30px;" type="checkbox"/>

It is your choice so do you agree to participate in this study?



I agree to participate
in the above study



I do **Not** want to participate
in the above study

Student's full name:..... Grade 6

Name of witness:..... Date.....

The relation to the child..... Signature.....

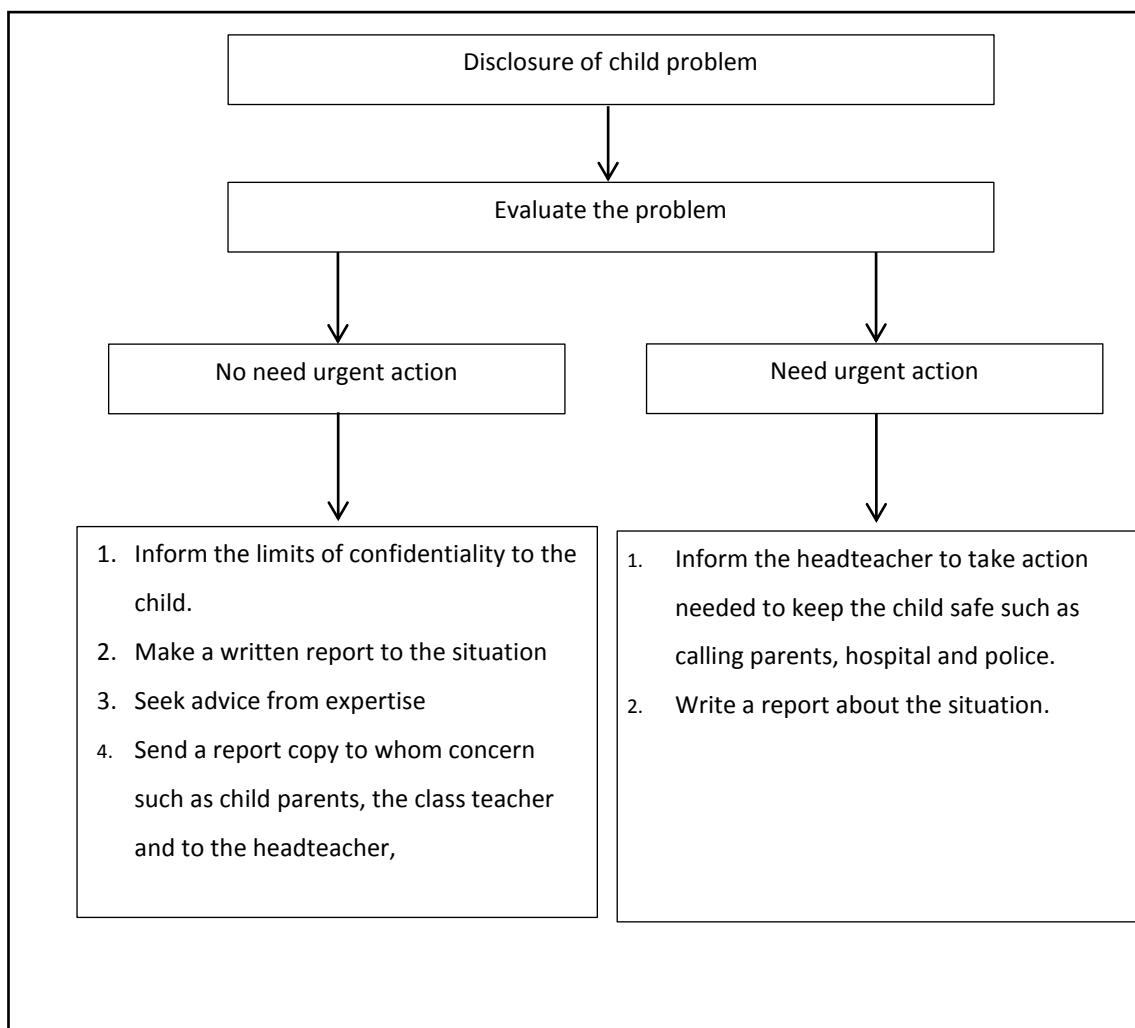
Person collecting consent:

Name:.....Signature.....Date.....

Copies:

1 for volunteer, 1 for researcher, 1 to be kept in the school

Appendix V: Risk Assessments guideline



Appendix VI: Teachers and Staff Information Sheet and Consent Form

Dear teachers and staff:

- I am Ahmed Alghamdi, working as a lecturer at Taif University. I am enrolled on the Doctorate in Philosophy (PhD) program at Cardiff University in Wales, United Kingdom.
- As a part of my postgraduate study I am conducting a research entitled “Factors affecting body weight in boys in grade 6 in Makkah, Saudi Arabia” and I would like to invite you to participate in this study and help me to achieve the study goals.
- The study aims is to explore each of the three types of school (public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia.
- Please take time to read the following information and please do not hesitate to call me for more clarification and information before you make your decision on 0554588440 or send an e-mail to asakg@live.com.

Yours Sincerely,

Ahmed Saleh Alghamdi

What is the purpose of the study?

- The aim of this study is to explore each of the three types of school (public schools, Islamic schools and private schools) in Saudi Arabia in terms of factors that can affect body weight among boys in Saudi Arabia.

Why I have been chosen to participate in this study?

- You have been invited to participate in this study either because you have direct contact with students at grade six or you are one of the staff at school.

What happens if I say No?

- You have the right to say No now or at any time during the study without giving any reason.

What will happen if I say Yes?

- The researcher will arrange a suitable meeting with you to conduct a semi-structured interview and it would be between 30 minutes and one hour in duration.
- The researcher will maintain privacy, safety and confidentiality during the period of the interview.
- The interview should be in a quiet place and will be recorded, which will then be transcribed.

What will happen to my information?

- The researcher will maintain all of your information including audio files under confidential conditions and in accordance with UK data protection policy.
- This study will not identify your name.
- The researcher will keep all information gathered confidentially, and no one will have access to it except the researcher.
- Direct quotes may then be used for research and academic purposes, and the results of this study may be presented at conferences and published in scientific journals.

What are the benefits of taking part?

- Taking part in this study is voluntary, and taking part may not benefit you personally but the information we gain may help us in the future.

What are the potential risks associated with this study?

- There will be no harm or costs to you as a result of taking part in this study.
- For further questions about the research process please do not hesitate to contact the researcher through his contact details below at any time of day.

Who is organising this study?

- The study is being organized by the Department of Nursing, School of Healthcare Sciences, at Cardiff University. The study will be run by the main researcher Ahmed Alghamdi in collaboration with Ministry of Education at Makkah Region.

Who has reviewed this study?

- This study has been reviewed by:
 - The School of Healthcare Sciences Ethical Committee on 16/09/2014.
 - The Research Review and Ethics Screening Committee (RRESC) on 04/06/2014.

Who we should contact for further information?

- Please do not hesitate to contact us for more information, we appreciate that at:
 - Researcher: Ahmed Saleh Alghamdi
Mobile number: 0554588440
Email: asakg@live.com
 - Supervisor: Dr Ben Hannigan
Cardiff School of Healthcare Sciences,
Email: hanniganb@cf.ac.uk
Telephone: +44 2920917726

Thank you for taking the time to read this information!

Teachers and Staff Consent Form

Title of research: Factors affecting body weight in boys in grade 6 in Makkah, Saudi Arabia.

Name of researcher: Ahmed Saleh Alghamdi

Please initial box

I confirm that I have read and understand the information sheet, version 3 dated 02-04-2015, for the above study and have had the opportunity to ask questions and to have these questions answered.	<input type="checkbox"/>
I understand that my participation is voluntary with free withdrawal at any time without giving any reason.	<input type="checkbox"/>
I understand that the interview will be recorded and transcribed, and direct quotations may be used for research and academic purposes.	<input type="checkbox"/>
I understand that the audio recording will be used anonymously.	<input type="checkbox"/>
I understand that the researcher will maintain all my information including audio files confidentially and it will remain the property of Cardiff University.	<input type="checkbox"/>
I understand that data collected may be used anonymously for; presentation in the final research report, publication in journals, presentations at conferences and other academic purposes.	<input type="checkbox"/>
I agree to participate in the above study.	<input type="checkbox"/>

Name of interviewee:.....

Signature.....Date.....

Person collecting consent:

Name:.....Signature.....Date.....

Copies:

1 for volunteer, 1 for researcher, 1 to be kept in the school

Appendix VII: The teacher and the school team members schedule

The interview questions

1. You are one of the staff at this school; can you please briefly describe the student health situation?
2. Can you explain what health topics are targeted in your school?
3. Can you tell me about the students' health behaviours?
4. Can you tell me your opinion about the students' food that is provided by the school?
5. Can you please describe the students' attention in regards to body weight?
6. What do you think the meaning of obesity is from children's perspective?
7. How do you think the children use the word obesity?
8. When do you think that children will use the word obesity?
9. What advice do you think children in sixth grade gives to those who want to control their body weight?
10. What advice do you think children in sixth grade give to those who want to increase their body weight?
11. What advice do you think children in sixth grade give to those who want to reduce their body weight?

Appendix VIII: The Themes from Foresight Obesity System Map

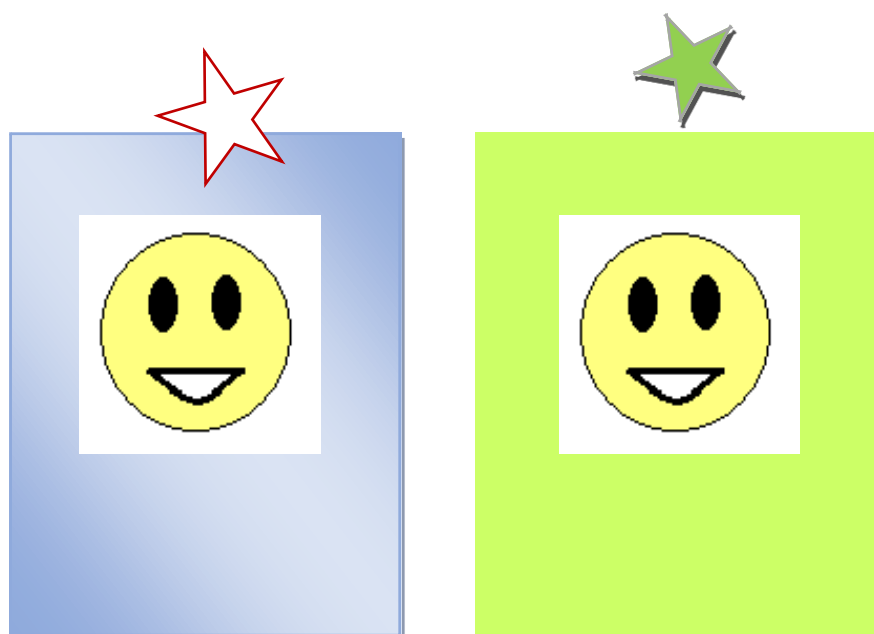
	Themes	Observation	Documents	Interviews	
				Teachers	Students
1	<p>The individual activity cluster, which consists of:</p> <ul style="list-style-type: none"> Exploring school timetables and how many physical exercise lessons are provided. Understanding students' health information about body weight. Observing students in school during physical exercise lessons. 	✓	✓		✓
2	<p>The individual psychology cluster, which involves</p> <ul style="list-style-type: none"> Observing students dealing with each other during the school day. Understanding factors that affect students' food choices. Exploring the level of parental control of students; food. 	✓	✓		✓
3	<p>The social psychology cluster, which captures:</p> <ul style="list-style-type: none"> Factors at a social level, such as media. Social attitudes to body weight. 	✓	✓	✓	✓
4	<p>The food consumption cluster, which includes:</p> <ul style="list-style-type: none"> The food market in schools. The level of food in school canteens. The variety of canteen food. The nutritional quality of food and drink. 	✓	✓	✓	✓
5	<p>The physical activity environment cluster, which includes:</p> <ul style="list-style-type: none"> Exploring schools' facilities for physical activity Exploring schools' barriers to physical activity 	✓	✓	✓	✓
6	<p>The food production cluster, which includes:</p> <ul style="list-style-type: none"> Schools' canteen systems School canteens and headteachers' responsibility Schools canteens and teachers' responsibility 	✓	✓	✓	✓

Appendix IX: The children's pamphlet

Sector Code: A , B , C
, 3 Class Code: A , B , C

School Code: 1 , 2
Student No:

★ Your Profile ★



Welcome!



I will ask you some questions and you can answer them any way you like!

Writin



Talkin



Drawi



-
- ☐ Researcher introduce himself
 - ☐ The study aims and objectives
 - ☐ The interview process
 - ☐ The study limitations

Writin



Talkin



Drawin



You have the right to participate in this study, and you have the right **not to** participate in this study.

It is your choice so do you agree to participate in this study?



Are you comfortable in this room?

Yes



No



Writing



Talking



Drawing



Have you seen the tape recorder?

Yes



No



Here are some pictures please (write or draw or talk) about them?



Writing



Talking



Drawing



How would you describe a healthy body?



Writin



Talkin



Drawin



What does the term obesity mean to you?

Do you ever use the word obesity?

☐

Yes

☐

No

How have you heard it being used?

What other words than obesity would you use?

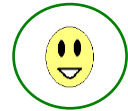
Writing



Talking



Drawing



Please describe these body types?



Writing



Talking



Drawing



What advice would you give to people who want to have a healthy body weight?



Writing



Talking



Drawing



What advice would you give to people who want to increase their body weight?



Writin



Talkin



Drawin



What advice would you give to people who want to decrease their body weight?



Writing



Talking

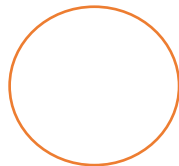


Drawing

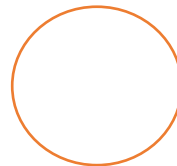


Do you need any type of help or support you need in regard
body weight?

Yes



No



End

