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NURSING MANAGEMENT OF PAEDIATRIC OBESITY

Literature Review

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ABSTRACT

Paediatric obesity is increasingly rising worldwide, affecting children of all ages. It can cause several health, psychological and social problems including the cardiovascular system, pulmonary system and gastrointestinal system as well as orthopaedic. Managing obesity in children can be a greater challenge not only to parents and guardians but also to nurses. Nurses play vital roles in the management of childhood obesity starting from the time the child is born or even when the mother is pregnant. This literature review was thus conducted to provide knowledge and information on how nurses can manage paediatric obesity hence prevent its health related risks and complications in children. The thesis discusses nursing interventions in paediatric obesity in addition to the roles of nurses in the management of childhood obesity. The aim of this thesis, was, nonetheless, to provide paediatric nurses with information on how they can manage obesity in children.

The data collection of this thesis was systematically researched from Cochrane, Medscape, Google scholar and Pubmed among others. Other nursing and healthcare journals were also searched and read. Related books were read from the libraries. Some literature were purchased. This thesis was analyzed using an inductive content analysis approach- where raw data were grouped into similar themes and useful information were extracted from the raw data in order to help answer the research questions.

The findings of this thesis demonstrated that preventing childhood obesity is the best, safe and recommended way of managing it. Even though some medical treatment options (e.g. medications and bariatric surgery) are available for extremely obese teens, nurses should work together with parents and aim at its prevention without waiting until its onset. The best way to prevent childhood obesity is through healthy eating and reducing sedentary lifestyles in children. Nurses can promote these through multifactorial nursing interventions (i.e. behavioural, dietary and physical interventions) in children and their families. The findings of this thesis are neither presented nor reported for further arguments, discussions or analysis since the thesis is a descriptive literature review. Nevertheless, this thesis recommends that in cases where children are already obese or are at a risk of being obese and their parents or guardians are showing no efforts nor interest in helping them, the nurses should take the responsibility of helping the child. In addition, the thesis suggests that further studies should be

done on the best ways in which nurses can take responsibilities of helping obese children from such families.

This thesis can be used mainly by nurses in any clinical setting that deals with children between the age of zero and eighteen, in childrens' healthcare centres, in pre and post-natal clinics, by any nurse addressing families on healthy living styles and by educational programs addressing childhood obesity.

Key words: childhood obesity, paediatric obesity, childhood obesity management, obesity treatment, obesity nursing interventions, nurses' roles in childhood obesity and literature review.

Lahden Ammattikorkeakoulu
Degree Programme in Nursing

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TIIVISTELMÄ

Pediatrinen lihavuus on lisääntymässä yhä enemmän mailmanlaajuisesti vaikuttaen kaiken ikäisiin lapsiin. Se voi aiheuttaa monia terveydellisiä, psykologisia ja sosiaalisia ongelmia sen lisäksi, että se vaikuttaa moniin kehon toimintoihin kuten sydämen ja verisuonien toimintaan, keuhkoihin, ruoansulatukseen sekä lisäksi luihin ja niveliin. Lasten lihavuuden torjunta ja hallinta voi olla suuri haaste vanhemmille, mutta myös sairaanhoitajille. Sairaanhoitajat ovat tärkeässä roolissa lasten lihavuuden hoidossa ja ennaltaehkäisyssä äidin raskausajasta alkaen. Tämän kirjallisen tutkielman tarkoitus on tuoda esiin informaatiota siitä, kuinka sairaanhoitajat voivat toimia pediatrisen lihavuuden saralla. Tutkielma käsittelee sekä sairaanhoidon väliintuloa pediatrisen lihavuuden yhteydessä että hoitajien roolia lapsuusiän lihavuuden hallinnassa. Tämän tutkielman päämääränä on tarjota pediatrisille sairaanhoitajille tietoa siitä, kuinka toimia lasten lihavuuden suhteen.

Tämän tutkielman tiedot ovat työstetty seuraavista lähteistä: Cochrane, Medscape, Google scholar ja Pubmed. Tietoja löytyi myös muista sairaan- ja terveydenhoidon artikkeleista. Aiheeseen liittyviä kirjoja on myös käytetty lähteinä tietojen etsimiseen. Tutkielman tiedot on analysoitu käyttäen induktiivista analyysiä, jossa käsittelemätön aineisto on kerätty ryhmiin teemojen mukaan ja tarpeelliset osat informaatiosta käytetty tutkielman kysymyksiin vastaamiseen.

Saadut tiedot osoittivat, että turvallisin, suositelluin ja paras tapa hallita lapsuusiän lihavuutta on sen ennaltaehkäisy. Vaikka erityisen ylipainoisille teineille on tarjolla joitakin lääketieteellisiä vaihtoehtoja (esim. lääkehoito ja leikkaus), tulisi sairaanhoitajien tehdä yhteystyötä vanhempien kanssa, jotta ylipainolta vältyttäisiin eikä jäätäisi odottamaan, että siitä on tullut ongelma. Paras keino estää lapsuusiän ylipaino on terveellinen ruokavalio sekä passiivisen elämäntyylin välttäminen. Sairaanhoitajat voivat ajaa tätä asiaa informoimalla lapsia ja perheitä näistä tärkeistä asioista. Tämä tutkielma on kirjallisuuskatsaus ja sen tiedot perustuvat aiempiin tutkimuksiin, jotka on tässä tutkielmassa esitetty sellaisinaan eikä tarkoitus ole tuoda esiin uusia argumentteja tai analyysejä. Kuitenkin, tutkielma suosittelee, että niissä tapauksissa, joissa lapset ovat jo ylipainoisia tai riskinä on ylipainoiseksi tuleminen eivätkä vanhemmat näytä tekevän asialle mitään, sairaanhoitajien tulisi ottaa vastuu lapsen auttamisesta. Lisäksi tutkielmassa ehdotetaan, että tulisi tehdä lisätutkimuksia siitä mitkä ovat parhaat

keinot, joiden avulla sairaanhoitajat voivat ottaa vastuuta lihavien lapsien auttamisesta niissä perheissä, joissa vanhemmat eivät ota vastuuta asiasta.

Tutkielmaa voivat pääasiassa käyttää sairaanhoitajat missä tahansa terveydenhoidon ympäristössä, jossa ollaan tekemisissä 0 - 18-vuotiaiden lasten kanssa, lasten terveyskeskuksissa, neuvoloissa, synnytysklinikoilla, sekä sairaanhoitajat, jotka tekevät opetuksellisia esityksiä lasten lihavuudesta tai ohjaavat perheitä terveellisiin elintapoihin.

Asiasanat: lapsuusiän lihavuus, pediatrinen lihavuus, lapsuusiän lihavuuden hallinta, lihavuuden hoito, sairaanhoidon keinot lihavuuden saralla, sairaanhoitajien rooli lapsuusiän lihavuudessa, kirjallisuuskatsaus.

Contents

1 INTRODUCTION

Paediatric obesity is a synonym for childhood obesity, i.e. obesity in children. It is a global epidemic and is increasingly rising worldwide, affecting children of all ages. Childhood obesity is a serious problem and has adverse effects and consequences on the patient. Some of these consequences might be long-lasting. (Birch, Parker & Burns 2011, 1.) It can cause several health, psychological and social problems in addition to affecting many systems of the body including the cardiovascular system, pulmonary system, gastrointestinal system as well as orthopaedic. It is strongly correlated with a wide range of health consequences, which, in most cases, tracks down into adulthood and worsens the illnesses later in life. (Moreno, Pigeot & Ahrens 2011, 43.)

This epidemic health disorder mainly develops when the energy intake exceeds the energy expenditure. The risk factors include genetic factors, learned behaviours and habits, advertisements, school environments, lack of enough sleep and medical conditions. (Skelton, Klish, Lorin, Motil & Hoppin 2015; Moreno, Pigeot & Ahrens 2011, 3.) As regarded by WHO (WHO 2012), the most safest and effective way to manage childhood obesity is by preventing it. Clinical treatments exists, however, they are largely aimed at bringing this condition under control rather than curing it. (WHO 2012; Paxson, Donahue, Orleans & Grisso 2010, 5; Schwarz, Windle & Bhatia 2015; Rippe & Angelopoulos 2012, 149.) Nursing multifactorial interventions like Motivational Interviewing, family based interventions, behavioural interventions and child growth monitoring are used by nurses in the management of this health disorder in children. These multifactorial interventions aim in modifying and encouraging healthy eating behaviours and regular exercise that persists throughout the childs' development and into adulthood. Use of drugs and medical procedures in the management of childhood obesity exists though their use is very rare due to the complications they impose on children hence they are only reserved for more severe cases in teenage. (SIGN 2010, 6; Crocker & Yanovski 2011; ICSI 2013; Schwarz, Windle & Bhatia 2015.)

Adopting healthy lifestyle habits including healthy eating and participation in physical activities can lower the risk of becoming obese as well as the risks of developing the health related effects that comes along with it. It is a common

agreement that children have limited responsibilities for their actions and that their parents, guardians and caregivers owe them a responsibility of care. (Moreno, Pigeot & Ahrens 2011, 7.) It is therefore the duties of their parents, guardians and caregivers to provide them with sufficient information on healthy nutrition and engage them in physical activities. Since infants and children are dependent upon the actions of their caregivers, they should be cared for in a manner that promotes their healthy growth, development and well-being throughout their lives (Birch, Parker & Burns 2011, 7). Nurses play vital roles in the management of paediatric obesity starting the time the child is born or even when the mother is expectant. Keeping track of the child's weight from the time the child is born, educating parents on paediatric obesity, etc. are examples of nurses' roles in the management of childhood obesity. (Milligan 2008.) Preventing paediatric obesity holds a promise for enabling significant gains towards both reversing the epidemic of childhood obesity and reducing obesity in adulthood.

The purpose of this thesis is to provide knowledge and information on how nurses can manage paediatric obesity. The thesis discusses the nursing interventions as well as the roles of nurses in the management of obesity in children. The objective of this thesis was however to find information, based on the already existing literature, on how nurses can manage childhood obesity. The aim of this thesis is to provide paediatric nurses with information on how they can successfully manage childhood obesity through their nursing intervention tools. The data of the findings of this thesis were analysed using an inductive content analysis method. The findings demonstrated that preventing childhood obesity is the best, safe and recommended way of managing it. Even though some medical treatment options (medications and bariatric surgery) are available for extremely obese teens, nurses should work together with parents and aim at its prevention without waiting until its onset. This thesis can be used mainly by nurses in any clinical settings that deal with children of ages zero to eighteen, in children healthcare centres, in pre and post natal clinics, by any nurses addressing families on healthy living styles and by educational programs addressing childhood obesity.

2 PAEDIATRIC OBESITY OVERVIEW

Obesity in children has been regarded by World Health Organisation (WHO 2012) as one of the most serious worldwide public health challenges that is persistently rising in the twenty-first century. Two years ago, there were around forty-two million children worldwide under the age of five who were either obese or at the risk of becoming obese. Of this estimate, approximately ten percent of the children under two years were obese. (Birch, Parker & Burns 2011, 19.) Similarly, obesity in children between the age of six and eleven has increased from seven percent to twenty percent whereas obesity in children aged five to nineteen has increased from five percent to nineteen percent (Harvey 2013, 608). If this continues, it is estimated that this number shall increase to seventy million by the year two thousand and twenty-five (Mayfield-Blake 2014). In the European Union alone, the number of children is expected to rise by one point three million yearly, of which more than three hundrend thousand of them shall become obese each year (Moreno, Pigeot & Ahrens 2011, 43).

2.1 Definition

Paediatric obesity is a synonym for childhood obesity, i.e. obesity in children. Obesity itself is being excessively overweight and occurs as a result of long-term energy imbalances, where daily energy intake exceeds daily energy expenditure. (O'Dea & Eriksen 2013, 3; Moreno, Pigeot & Ahrens 2011, 22; Klish, Motil, Geffner & Hoppin 2015; WHO 2012; Canoy & Bundred 2011.) Even so, being overweight should not be confused with being obese. There have been confusions between the two words (overweight and obesity), and different researchers have used the terms differently but it should be noted that they have different meanings. Even though overweight is a stage to obesity, most overweight children and adolescents do not become obese. (Moreno, P. & A. 2011, 8; O'Dea & E. 2010, 3-10.) Hence, it is appropriate to avoid the confusion and be strict on the use of the two words.

In adults, obesity, as defined by WHO (WHO 2012), is a BMI (Body Mass Index) which is greater than or equal to thirty. BMI is weight in kilograms divided by height in metres square. However, obesity in children and adolescents is based on

percentile curves of the BMI because as they grow, their height, weight and body fat changes since their bodies continously undergo a number of physiological changes. Since the BMI above the ninety-fifth percentile is consistent with adult definition of obese, children are thus definied as being obese if they have a BMI which is equal or greater than the ninety-fifth percentile. (O'Dea & Eriksen 2010, 3-4; Paxson, Donahue, Orleans & Grisso 2010, 6 & 20; Klish, Motil, Geffner & Hoppin 2015; WHO 2012; Schwarz, Windle & Bhatia 2015; Rippe & Angelopoulos 2012, 140-141; Moreno, Pigeot & Ahrens 2011, 1, 21-24; SIGN 2010, 6 & 37; Tesmer, Beecher & Hagen 2011, 15; Kies, Wabitsch, Maffeis & Sharma 2015, 3-5; Durr 2012, 2; Canoy & Bundred 2011; Crocker & Yanovski 2011.)

Obesity is associated with various health risks and complications and is thus defined by WHO (WHO 2012) as the accumulation of excessive fat in the body that poses risks to the health of the patient. Without debating whether it is a disease or not (Moreno, Pigeot & Ahrens 2011, 8), its definition as defined by WHO implies that it is a medical condition. Paediatric obesity can therefore be defined as a medical condition that affects children and adolescents and occurs when their BMI is equal or greater than the ninety-fifth percentile (Durr 2012, 2; WHO 2012; Rippe & Angelopoulos 2012, 140-141; O'Dea & Eriksen 2010, 3-4; Tesmeer, Beecher & Hagen 2011, 15).

2.2 Effects and consequences

Childhood obesity can cause many health, psychological and social problems to the child. It affects many systems of the body like the cardiovascular system (mainly heart disease and stroke); pulmonary system; gastrointestinal system and orthopaedic (e.g. musculoskeletal disorders especially osteoarthritis- a highly disabling degenerative disease of the joints). Other chronic diseases resulting from childhood obesity include diabetes (mainly Diabetes Mellitus 2); insulin resistance; sleep apnea; High Blood Pressure; and some cancers (kidney cancer, breast cancer, colon cancer, oesophaegal cancer). These diseases, often referred as Non-Communicable Diseases (NCDs), not only cause long term illnesses but also premature death. In addition, obesity in children, especially in adolescents can

also lead to psychological effects like greater risk of teasing, bullying, low self-esteem, social isolation, depression, lowered self-image, poorer quality of life than the normal weight adolescents, hormonal imbalances, obesity in adulthood and premature death due to a potential decline in life expectancy. (WHO 2012; Canoy & Bundred 2011; Paxson, Donahue, Orleans & Grisso 2010, 4-8; Moreno, Pigeot & Ahrens 2011, 1-7 & 43; Bagchi 2010, 234-241 & 319; Durr 2012, 8; Klish, Motil, Geffner & Hoppin 2015; Schwarz, Windle & Bhatia 2015; Mazzeo, Aren, Germeroth & Hein 2012; Harvey 2013, 608; Lehman 2014; Rippe & Angelopoulos 2012; Tesmeer, Beecher & Hagen 2011, 8 & 18-19; Kiess, Wabitsch, Maffeis & Sharma 2015, 1-2; Michalsky, Reichard, Inge, Pratt & Lenders 2012.) Due to common beliefs that obesity results from laziness (Rippe & A. 2012, 142; Moreno, P. & A. 2011, 43), obese children and their families often feel embarassed and ashamed in addition to receiving insensitive criticisms from the public (Moreno, P. & A. 2011, 10-11; Durr 2012, 8; WHO 2012; Schwarz, Windle & Bhatia 2015; Rippe & A. 2012, 142; O'Dea & Eriksen 2012, 196; Tesmeer, B. & H. 2011, 8 & 18-19).

2.3 Risk factors

Due to rapid rising of technologies, there has been changes in social settings and lifestyles which have impacted children's behaviours- with unhealthy dietary habits and sedentary lifestyles becoming the norm (Moreno, Pigeot & Ahrens 2011, 3; Paxson, Donahue, Orleans & Grisso 2010, 3; Klish, Motil, Geffner & Hoppin 2015; Davies, Fitzgerald & Mousouli 2008, 6), thereby resulting into childhood obesity. According to WHO (WHO 2012), there has globally been, among children and adolescents, an increase intake of energy densed foods that are high in fat and a decrease in physical activities due to the inceasingly sedentary lives. Reports have indicated that physical activity in children has recently declined, implying an increase in sedentary lifestyles (Lifshitz 2008). The main cause of obesity is the energy imbalance between the calories consumed and calories expended. Obesity develops as a result of taking too many calories and not getting enough physical activity. (Canoy & Bundred 2011; Lifschitz 2008; WHO 2012; Moreno P. & A. 2011, 3; Durr 2012, 8; Klish, M., G. & H. 2015; Davies, F. & M. 2008, 6; Freemark 2010, 125.) If the amount of calories

consumed are the same as the amount of calories expended, the weight remains stable; but if consumed calories are more than those that the body burns up then there is a weight gain as this excess energy is converted into fats and stored in the body (Moreno P. & A. 2011, 3; Freemark 2010, 125).

There are several factors contributing to childhood obesity, making children to expend less energy than they consume (Skelton, Klish, Motil & Hoppin 2015). These factors include genetic factors, learned behaviours and habits, advertisements, school environment, lack of sleep and medical conditions. (Moreno, Pigeot & Ahrens 2011, 2-3; Paxson, Donahue, Orleans & Grisso 2010, 8 & 24; Klish, Motil, Geffner & hoppin 2015; Davies, Fitzegerald & Mousouli 2008, 6; O'Dea & Eriksen, 2010, 195; WHO 2012; Lifschitz 2008; Birch, Parker & Burns 2011, 6; Cobert, B. & Cobert, J. 2011, 25.)

Genetic factors: obesity runs in families. Previous studies have indicated that the BMI of biological parents are more closely related with the weight status of their children even when they do not live together (Lifshitz 2008; Canoy & Bundred 2011; Paxson, Donahue, Orleans & Grisso 2010, 24; Klish, Motil, Geffner & Hoppin 2015). Even though weight problems runs in families, not all children with a family history of obesity becomes obese. Nonetheless, childhood obesity can be linked to shared family behaviours such as eating and activity habits that promotes or encourages unhealthy eating and less physical activity (Paxson, D., O. & G. 2010, 6; Klish, M., G. & H. 2015; O'Dea & Eriksen 2010, 195; Benaroch 2014). However, obese parents impose a great risk that their children will be obese. For instance, when both parents are overweight, there is eighty percent chance that that their children will be obese; when one parent is obese, the obesity incidence in their children decreases to forty percent; when both parents are lean, obesity occurrence drops to approximately fourteen percent. There is more than a seventy-five percent chance that children aged between three and ten will be overweight if both parents were obese and drops to a twenty to twenty-five percent chance with just one obese parent. (Lifshitz 2008; O'Dea & E. 2010, 195.)

Learned behaviours and habits: learned behaviours from parents are a major contributor to childhood obesity. Parental influence plays a strong role in a child's health from the day a child is born as they copy and learn behaviours from their

parents. It is in the family that children copy and practice dietary and lifestyle habits as well as receiving the first guidance that influences their health, fitness and well-being. (Moreno, Pigeot & Ahrens 2011, 10; WHO 2012.) For example, if a parent(s) has poor, unhealthy diet and exercise habits, the child is likely to adopt such habits. Infants and young children are very good at listening to their bodies' signals of hunger and fullness. They will stop eating as soon as their bodies tell them they have had enough, though sometimes their parents or guardians may force them to finish their plates. This, in turn will force them to ignore their fullness and eat everything that is served to them. Such behaviours affect their eating habits when they get used to them and might result into obesity. (Kaneshiro, Zieve, Ogilvie & A.D.A.M. 2014.)

Advertisements: advertisements of, and easily affordability of fast foods has also influenced the consumption of unhealthy foods, whose industry has increased and multiplied in most places worldwide (Lifshitz 2008). An evidence by WHO (WHO 2012) also found that the advertisement of foods with high content in fat sugar or salt are more widespread across the world. Television advertisement influences children's food preferences, purchase requests and consumption patterns. Children are also increasingly being exposed to a wide range of other marketing techniques like supermarkets, billboards, internet, posters, etc., which in turn influences unhealthy consumption patterns and dietary habits. (Moreno, Pigeot & Ahrens 2011, 11, 15-16; WHO 2012; Birch, Parker & Burns 2011, 1; Paxson, Donahue, Orleans & Grisso 2010, 14; Harvey 2013, 608; O'Dea & Eriksen 2010, 214-215; Tesmeer, Beecher & Hagen 2011, 8-10.)

School environment: schools have an important role of teaching children about healthy food choices and exercise. However, not all schools offer healthy food choices or time for physical activity. Availability of energy dense, high calorie foods at schools as well as the vending machines in schools that sells sodas and other sugary sweetened beverages makes it easy for children to make unhealthy choices. (Paxson, Donahue, Orleans & Grisso 2010, 8; Tesmeer, Beecher & Hagen 2011, 8-9.)

Lack of sleep: lack of enough sleep has also been found to be a possible risk factor for paediatric obesity. Children who sleep less hours tend to eat more. This is due

to production of hormones leptin and ghrelin. Leptin is released by fat cells to tell the brain that fat stores are sufficient and ghrelin is released by the stomach as a signal of hunger. Therefore, in children who do not get enough sleep, leptin levels tend to be low whereas ghrelin levels tend to be high. These changes in hormone levels may encourage a child to eat more. (Birch, Parker & Burns 2011, 6; Klish, Motil, Geffner & Hoppin 2015; Wright, Harding & Cox 2015.)

Medical conditions: certain medications such as hormone disorders or low thyroid function can also cause excess weight gain, though not common in children. Certain medications such as psychiatric drugs (e.g. olanzapine and risperidone), steroids or anti-seizure medications can also cause obesity by increasing a child's appetite, which over time increases their risk for obesity. (Cobert, B. & Cobert, J. 2011, 25; Klish, Motil, Geffner & Hoppin 2015; Kaneshiro, Zieve, Ogilvie & A.D.A.M. 2014.)

3 PURPOSE AND OBJECTIVES OF THE THESIS

The idea of this thesis started at the author's clinical training place where a twenty year old patient had completely lost all his kidney functions due to childhood obesity complications and was waiting for a second kidney transplant. It was difficult for the author of this thesis to comprehend that at the age of fifteen, a young boy, full of life, had already completely lost all his kidney functions as a result of childhood obesity, had his first kidney transplant which also failed five years later; and was queuing for a second kidney transplant just at the age of twenty. As a nursing student, the author wondered if the parent had some knowledge on childhood obesity and if she had really tried to manage it. The author also wondered whether the nurses and other pediatricians who had been taking care of this boy never alerted the parent on the obesity issue or the parent was just too reluctant and ignorant to support the son. The author did not get a precise answer to this but however assumed that the parent was just hesitant in managing the obesity. As a future nurse, the author then decided to do this literature review on how nurses can manage childhood obesity.

The purpose of this thesis was thus to provide knowledge and information on how nurses can manage paediatric obesity. The thesis discusses the nursing interventions in paediatric obesity management as well as the roles of nurses in the management of this disorder in children. The objective of this thesis was however, to find information based on the already existing literature, on how nurses can manage childhood obesity. In addition, through this literature review, the author wanted to develop a broader understanding of this disorder and share the knowledge while creating awareness and providing education about this health disorder in children.

The reason for choosing this topic was to gain information on how nurses can successfully manage childhood obesity in order to prevent its health related risks and complications in children. The aim of this thesis is to provide paediatric nurses with information on how they can successfully manage obesity in children through their nursing intervention tools. In addition to providing information on childhood obesity management, this thesis also discusses the roles of nurses in the management of childhood obesity. This thesis can mainly be used by nurses in

any clinical setting that deals with children between the age of zero and eighteen, in children healthcare centres, in pre and post-natal clinics, by any nurse addressing families on healthy living styles or by educational programmes addressing childhood obesity.

3.1 Research questions and keywords

Three research questions were formed with an aim of guiding and helping the author in finding accurate information and findings of this thesis topic. The research questions were:

1. How can nurses address and help in the management of childhood obesity?
2. What are the roles of nurses in the management of paediatric obesity?
3. In what ways can childhood obesity be managed?

Keywords were also formed in order to enable the author find relevant published literature. The same keywords can also help the reader locate this thesis on the online databases, for example in www.theseus.fi. The keywords were: childhood obesity, paediatric obesity, childhood obesity management, obesity treatment, obesity nursing interventions, nurses' roles in childhood obesity and literature review. Paediatric obesity and childhood obesity are synonyms but were all used as keywords in this thesis in order to enable the author find more information for this thesis' topic. Some researchers or healthcare professionals researching on a similar topic have used childhood obesity while others have used paediatric obesity in their research. For this reason, using only one of them as a keyword was seen to limit the findings of this research. It is also important to note that the word overweight was not used a keyword in this thesis even though many researchers have used it to refer to obesity (O'Dea & Eriksen 2010, 3). Being obese and overweight are two different things. Although overweight is a stage to obesity, not all overweight children becomes obese (Moreno, Pigeot & Ahrens 2011, 8). Therefore, to avoid any confusions and also for the reliability of the findings of this thesis, the research of this thesis was strictly limited to obesity and not overweight.

3.2 Study limitation and implementation

This thesis being a descriptive literature review, the author had to rely on the findings of previous research. There were no interviews done by the author to confirm the findings. This was seen as a limitation of this thesis as it is entirely based on already published materials, with no assurance that the results had not changed within the past few months neither was there any proof on the reported results by the previous researchers. The data collection was however from recent literatures which were published not earlier than two-thousand and eight. The fact that the word overweight was left out in the keywords of this thesis may also be considered a limitation. This is because some previous researchers on similar topics have used the word overweight while referring to obesity. Leaving it out from this thesis and strictly using the word obesity might have limited the findings of this thesis based on the fact that the literature that used the word overweight while referring to obesity were left out. Finland being a Finnish speaking country, finding literature on this topic in English was not easy. The author had to buy some books and journals, loan some books and read some literature at a fee.

The table below shows the implementation of this literature review:

May, 2014	Thesis enrolment was done and topic was approved and data collection started.
October, 2014	The thesis plan was presented in a seminar. Among the feedback given during this seminar, there was a call to narrow the thesis topic. The topic was therefore narrowed from causes, effects and management of paediatric obesity to how nurses can manage paediatric obesity
October, 2014 – June, 2015	Data collection continued
July, 2015	Data analysis was done
September, 2015	Final thesis was presented to the supervising teacher. There was a call for few corrections
October, 2015	The corrections were rectified and a new copy of this literature review was presented to the teacher again. The teacher gave a go-ahead to continue with the final presentation
November, 2015	Final presentation of the thesis done and there was a call by the external evaluator to change the thesis topic to Nursing Management of Paediatric Obesity

Table 1: Implementation of the thesis

4 DATA COLLECTION AND ANALYSIS

4.1 Data collection

This thesis is a descriptive literature review that describes and summarizes earlier published information on this thesis' topic. Its purpose is to provide information and knowledge on what had been already published by earlier researchers. It summarizes the similarities in the findings on what previous researchers had published in regards to this topic. It does not report on any new information neither does it push the results forward for further analysis or discussions. Instead, it reports the information based on the already published information. A descriptive literature review is a type of research that uses secondary sources and does not report new or original experiments. It evaluates the similarities and differences of the already published information (Fink 2010, 3) with a purpose of providing information (University of Sydney 2014). Descriptive literature reviews do not develop arguments neither do they present results for further discussions and analysis, but provide information as they stand without transforming them. In addition, the participants of a descriptive literature review are never people but previous literatures. (Josette 2012, 9; Cronin, Ryan & Coughlan 2008.)

For data collection of this thesis, different related literatures were searched through before being analysed for the results. The literature search was done from online databases; books were searched from libraries and read; nursing and healthcare journals were also read. Cochrane, Medscape, Google Scholar and Pubmed were among the databases that were searched through during data collection. Related books were read from libraries. The keywords that were used in the search were childhood obesity, paediatric obesity, childhood obesity management, obesity treatment, obesity nursing interventions, nurses' roles in childhood obesity and literature review.

The diagram below is an example of the literature search results in the first data collection process:

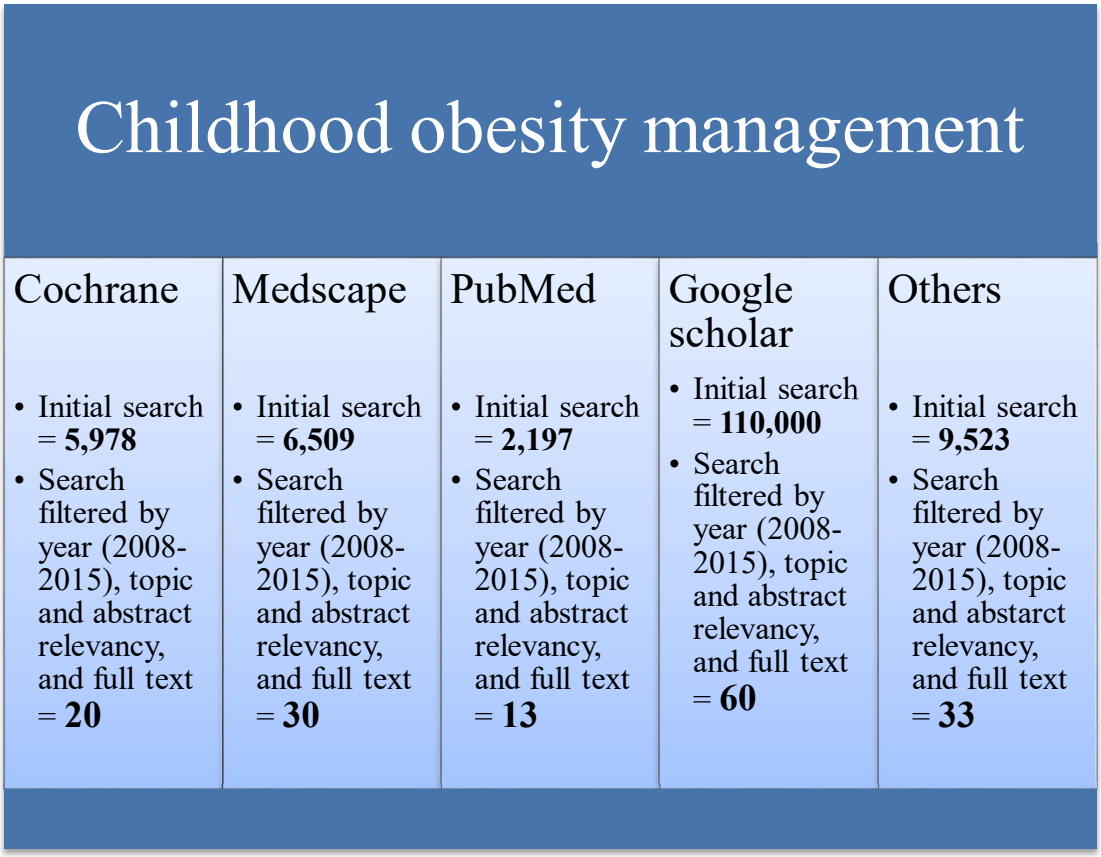

Figure 1: Literature Search Results in the First Data Collection Process

Data collection of this thesis started in September two-thousand and fourteen. In this first data collection process, the articles were examined whether they met the selection criteria and only articles that fulfilled the selection criteria were included. Articles that had the following characteristics were regarded in the first data collection process as fit to be included in the first selection criteria:

- the topic and the abstract of the literature was relevant to the topic of this thesis
- the literature was published, and, or last reviewed in the year two-thousand and eight onwards
- the literature allowed further use of its information
- the literature could be read in full text
- the literature was from reliable sources

4.1.1 Ethical considerations

This thesis being a descriptive literature review, some ethical issues like beneficence, privacy and confidentiality of participants were not put into consideration during data collection since the participants of this thesis were not people, but previously published literature. However, copyrights of the sources that were used for this thesis were respected and adhered by. Literature that had restriction on the second use of its information were not included during data collection. In addition, all the secondary information that were used in this thesis were well referenced and the publishers of the information clearly stated.

The topic of this thesis was important to the author as it provided the author with much information and knowledge on how nurses can manage paediatric obesity. As a future nurse, the author is now well equipped with her roles on the management of paediatric obesity as well as the nurses intervention strategies used in the management of childhood obesity. In addition, the author has widened her knowledge on the treatment and prevention strategies for childhood obesity

and has achieved the necessary knowledge required of her in educating and creating awareness of this medical disorder in children.

4.2 Data analysis

A descriptive literature review may have topics and headings grouped into similar themes or topics in order to help in the comparison of their findings. This helps the researcher in analyzing the findings for reliable results. (Fink 2010, 206.) This thesis was analyzed using an inductive content analysis method, where the raw data findings were grouped into similar themes and descriptions, after which, useful information were extracted from the raw data in order to help answer the research questions. The fact that the author of this thesis did not have enough prior knowledge on this topic was also another reason for using inductive content analysis method in analyzing the findings of this thesis. Inductive content analysis used in a qualitative research is a method of content analysis used to develop theory and identify themes by studying documents, recordings and other printed materials. It is recommended when there is not enough previous knowledge about the research topic. It relies on inductive reasoning, in which themes emerge from raw data through repeated examination and comparison, i.e. categorizing and indexing raw data into themes. This process requires repeated reading of the material and writing down headings or themes. This helps in extracting only important information that answers the research questions. Depending on the research question, the element of analysis can be a letter, a word or a sentence. (Schamber 2000.)

In the analysis process of this thesis, data that were collected in the first data collection process were re-read through over and over and were reduced upon reading. In the second data collection process, the number of articles were already reduced. Four themes were then formed during the reading process and data were grouped into similar themes upon re-reading over and over again. The themes that were formed were ‘childhood obesity management’, ‘obesity treatment in children’, ‘paediatric obesity prevention’, and ‘nurses’ roles in childhood obesity’. These themes were formed because they gave answers to the research questions of this thesis. During this process, only the important and relevant information were

listed down under similar themes. Also, the data that showed similarities among the articles collected were included in the list. This led into the reduction in the number of articles that were collected as the articles that showed irrelevancy to the formed themes were eliminated from the list. The articles that were finally selected were again re-read through over and over, were then scrutinized, analyzed, interpreted and the findings were finally reported.

The table below shows a summary of data collection and analysis process of this thesis.

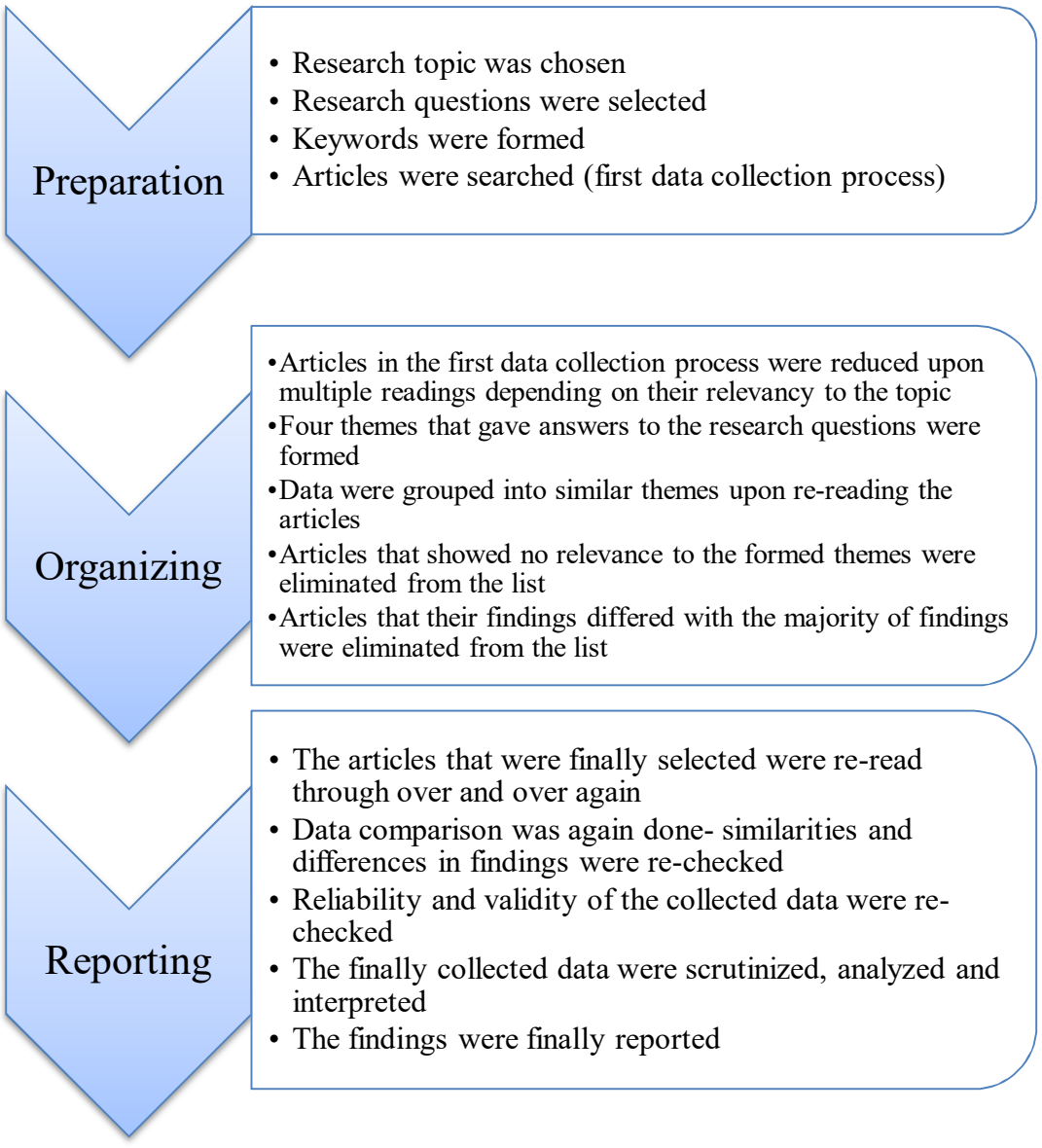

Figure 2: Data Collection and Analysis Process

4.2.1 Reliability and validity of the data

This thesis is a descriptive literature review that describes and summarizes earlier published information on this thesis' topic without creating arguments neither presenting its results for further discussions and analysis. Therefore, its findings were based on the already published results. No experiments were done by the author of this thesis to prove any results. However, the manner in which the data collection analysis of this thesis (see figure 2) was conducted shows that the findings of this thesis are valid and reliable. The comparison of the results of the collected data and reporting only the findings with similarities while leaving out the findings that showed some differences, accurately describes the reliability and the validity of the findings of this thesis. The findings that were reported by the author of this thesis showed consistency and repeatability, hence explains the reliability and the validity of the findings of this thesis. In addition, literature from which the data for this thesis were collected were recent. This means that the information collected were not outdated as the literatures were not more than eight years since the publication, and, or the last reviewed date. For this reason, it is no doubt that the findings of this thesis are valid. The key words and the themes that were formed were in line with the topic of this thesis and all of them provided precise answers to the research questions of this thesis. For these reasons, the reliability and the validity of the findings of this thesis is with no doubt unquestionable.

5 FINDINGS

Management of a medical condition means treatment and control of diseases or medical disorders as well as the care of patients who suffer from them. It is the process of dealing with and controlling diseases and medical disorders. (Medical Dictionary 2015.) The main aim of managing a disease is to completely eradicate it by preventing and treating it. Similarly, the main focus in managing paediatric obesity is on the controlling and preventing of unhealthy weight gain and unhealthy weight loss by safely and effectively reducing the Body Mass Index (BMI) of the patient thus preventing the long term complications. (Schwarz, Windle & Bhatia 2015; ICSI 2013.) This involves the promotion of healthy eating and being physically active in children in order to avoid energy imbalances (which is the main cause of paediatric obesity), thereby helping in the prevention of childhood obesity. (Klish, Motil, Geffner & Hoppin 2015; ICSI 2013.)

As childhood obesity increases so is the occurrence of the associated illnesses. For this reason, it is essential that nurses and other healthcare providers identify obese children as soon as possible so that its management can be started before the condition gets worse. (Klish, Motil, Geffner & Hoppin 2015; Lehman 2014; Moreno, Pigeot & Ahrens 2011, 7; Treadwell, Sun & Schoelles 2008.) However, prevention of this medical condition is preferred and is the best recommended treatment. Nurses and other clinicians should always aim at its prevention and not wait until its onset. The primary goal of managing it is by the control of body weight with healthy eating and adequate physical activity for growth and development. (SIGN 2010, 6; Schwarz, Windle & Bhatia 2015; Moreno, P. & A. 2011, 3; Kiess, Wabitsch, Maffeis & Sharma 2015, 172.) It is advisable that nurses are equipped with knowledge on the different ways in which paediatric obesity can be managed by preventing it and treating it, i.e. medical and non-medical management (Treadwell, S. & S. 2008; Michalsky, Reichard, Inge, Pratt & Lenders 2012). This chapter reports the findings of the topic of this thesis. It reports on how nurses can manage paediatric obesity using the nursing intervention tools in addition to the different ways of managing childhood obesity medically and non-medically.

Medical management of paediatric obesity involves its management through use of medicines and medical procedures. On the other hand, non-medical management is the management of paediatric obesity through multifactorial nursing interventions (i.e. behavioural, dietary and physical interventions) without the use of any medicines. (Canoy & Bundred 2011; Schwarz, Windle & Bhatia 2015.) Either way, it is recommended that childhood obesity management should include behaviour change factors, be family based- involving at least one parent and guardian and should aim to change the whole family's lifestyle. No matter the form of management, they should all target at decreasing the overall dietary energy intake, increasing levels of physical activity and decreasing time spent in sedentary behaviours. (SIGN 2010, 6; Schwarz, W. & B. 2015; Kiess, Wabitsch, Maffeis & Sharma 2015.)

5.1 Nursing interventions in the management of paediatric obesity

Nursing interventions in the management of paediatric obesity aims in encouraging and modifying healthy eating behaviours and regular eating exercise that continues throughout the child's development through to adulthood. This is due to the fact that unhealthy diet and lack of physical activity are the main culprits of childhood obesity. Therefore, the best approach that paediatric nurses can use in the management of this disorder is through multifactorial interventions. Multifactorial interventions are the behavioural, dietary and physical interventions that aims for a healthy living. In addressing the multifactorial interventions, nurses can use approaches like Motivational Interviewing (MI), behavioural interventions, family-based interventions and child growth monitoring. Regardless of the approach used, parental involvement is recommended and should be actively facilitated. (WHO 2012; Skelton, Klish, Lorin, Motil & Hoppin 2015; Birch, Parker & Burns 2011, 5-7, 35-36; Crocker & Yanovski 2011; SIGN 2010, 6, 40-42; Schwarz, Windle & Bhatia 2015; Oude, Baur, Jansen, Shrewsbury, O'Malley, Stolk & Summerbell 2009; Rippe & Angelopoulos 2012, 142.)

5.1.1 Motivational interviewing (MI)

Nurses should use MI techniques as a tool for encouraging behaviour change. MI is a technique used with adults to prepare them to change addictive behaviour. This technique has been proved to be effective in the management of childhood obesity and is increasingly used by paediatric nurses in the management of paediatric obesity. Since children do not have enough authority to make their own choices and depends on the choices their parents or guardians makes for them, this technique may be beneficial for families who are not ready for behavioural change or who find it difficult to practice healthy eating and exercise behaviours. The counselling they get from MI may help them to improve their motivation or help them from deferring their children from obesity therapy. This technique basically addresses the patients' willingness (in this case the parents' or the guardians' willingness) to change and has been well accepted by parents to be effective for many paediatric patients. (Kiess, Wabitsch, Maffeis & Sharma 2015, 72; Skelton, Klish, Lorin, Motil & Hoppin 2015; ICSI 2013; AHRQ 2013.)

A practical way in which nurses can address readiness for change is to get to know from the family members how much they are concerned with their children's weight, get to know whether they believe that weight loss is possible as well as the practices they need to change. The nurse employs reflective listening in order to encourage the paediatric patients, parents and guardians to identify their own reasons for making a behaviour change as well as their own solutions. Reflective listening is the communication between two parties in which the listener tries to understand the speaker's idea then offer back the same idea to the speaker to note that the subject has been understood. The tone of MI should always be non-judgmental, empathetic and encouraging. The nurses helps the family to focus on specific and achievable behavioural goals which usually means selecting a few specific behaviours related to weight management and overall health and not only weight loss goals. Nurses can assess readiness for change through the interviewing questions or use of a numerical scale (e.g. on a scale of one to ten or how ready they are to consider making the change to diet or exercise). These interviewing questions can be open questions based on the discussion between the nurse and the family. Formal assessment of the patients' and their families' motivation may also be applied in health-related behaviours.

This assessment may help the family, the paediatric patient and the nurse to recognize any uncertainty, which is an important step in changing behaviours. (Skelton, Klish, Lorin, Motil & Hoppin 2015; ICSI 2013; Kiess, Wabitsch, Maffeis & Sharma 2015, 72.)

5.1.2 Behavioural interventions

Behavioural interventions involves those multifactorial approaches interventions used by paediatric nurses in the management of childhood obesity. These interventions usually targets the behaviour modification. Behaviour modification as an approach to weight loss may include encouragement to reduce sedentary behaviours and increase physical activity; psychological training to motivate a change in eating behaviours or exercise; and also as family counselling to support weight loss goals. Experts suggests that sedentary behaviours in children should be reduced to not more than two hours a day or fourteen hours per week. A daily sixty minutes of moderate activity is recommended by WHO (WHO 2012) for children and adolescents. Both dietary and exercise interventions should be combined together in order to enhance weight loss and improve long-term maintenance to obese children and adolescents. (SIGN 2010, 41; Crocker & Yanovski 2011; AHRQ 2013; ICSI 2013.)

Parental involvement is very important in the interventions. This is because parents usually take the first lead in the prevention of this medical disorder owing to the fact that children and adolescents have very limited ability to choose the environment in which they live or the food they eat in addition to having a limited ability to understand the long-tern consequences of their behaviour. A parent can successfully modify the diet and activity of a younger child who is not ready for change. Parental involvement may also assist nurses in identifying the key practices and behaviours related to obesity that may not be clear to parent-child relationships; helps to strengthen the treatment recommendations; and also create a healthier home environment with greater social support and fewer barrier to success. (Rippe & Angelopoulos 2012, 142; Skelton, Klish, Lorin, Motil & Hoppin 2015; AHRQ 2013; Moreno, Pigeot & Ahrens 2011, 7-9; WHO 2012; Paxson, Donahue, Orleans & Grisso 2010, 5; Birch, Parker & Burns 2011, 3-4.)

Behavioural interventions that includes modifiable factors should be addressed by paediatric nurses. The modifiable factors often include parenting style and child's early feeding experience. Parenting style can influence a child's eating behaviour and sedentary lifestyle, which are the major contributing factors to weight gain, thereby resulting into obesity. Nurses are advised to begin, as early as possible, the interventions in order to decrease sedentary behaviours. It is recommended that nurses initiate the treatment suggestions and educate families on childhood obesity. All the family members and all the caregivers of the child should be involved in the treatment program. The involvement of the entire family and all caregivers creates new family behaviours that are consistent with the child's new eating and activity goals. Such environmental change is essential to the long-term success of the treatment. The interventions should bring about permanent changes and not short-term diets or exercise programs aimed at rapid weight loss. For successful results, the family must be ready for change. (O'Dea & Eriksen 2010, 196-197; ICSI 2013; Freemark 2010, 131-132.)

5.1.3 Family-based interventions

Paediatric nurses should encourage and support both parents and guardians to engage their children in activities that encourage them to be more active, eat more nutritious foods and spend less time on screen based activities. Some families who are not ready for change may express lack of concern about their child's obesity; or may believe that obesity can neither be avoided nor changed; or may simply not be interested to modify their eating and exercise behaviours. In such cases, nurses can organize programs that modifies the family's eating and exercise patterns. The programs can include healthy eating, paediatric patient and parent education, behavioural modification and exercise. These have shown successful results in limiting weight gain in many paediatric patients who have mild or moderated obesity. Parent involvement is very important in any therapeutic intervention for an obese child or adolescent. Any intervention is likely to fail if it does not involve understanding, approval, support and active participation of parents and other family members. In some cases, the child may be the only one with obesity in the entire family. In this case, family therapy is effective and beneficial- a successful treatment would therefore require a change in the entire

family's approach to eating and exercise. In addition, targeting a parent as an important agent of behaviour change, with or without the child, is more effective for long-term weight management than targeting only the referred child without parental participation. (Skelton, Klish, Lorin, Motil & Hoppin 2015; Rippe & Angelopoulos 2012, 144-145; Tesmeer, Beecher & Hagen 2011, 8-10; Kiess, Wabitsch, Maffeis & Sharma 2015, 150-152; ICSI 2013.)

5.1.4 Child growth monitoring

Taking part in ante-natal clinic visits is an important part of childhood obesity prevention as it helps in monitoring the weight status of infants and young children. They are weighed and both of their weight and height are recorded by their nurses. This helps in tracking children who are at the risk of becoming obese and early prevention measures can be taken before obesity strikes. Nurses calculate the BMIs of all children between the ages of zero and eighteen and documents all measurements in the children's medical records. Knowing the child's BMI helps parents and children to monitor their weight status and related health behaviours such as eating and exercise. It also helps make related behavioural changes to maintain a healthy weight. It is recommended that nurses should monitor BMI percentiles of children at least annually in order to help emphasize weight maintenance so as to reduce the risk of children becoming obese. Paediatric nurses should also assess the paediatric patients for any possible medical causes or risk factors of obesity as well as existing obesity related illnesses. In case of any risk, they should give parents appropriate information, suggestions and referrals to identify behaviours putting the child at a risk. (SIGN 2010, 44; Birch, Parker & Burns 2011, 35-36; AHRQ 2013; Lehman 2014.)

5.2 Medical management of paediatric obesity

As regarded by WHO (WHO 2012), prevention of paediatric obesity through multifactorial interventions (i.e. behavioural, dietary and physical), is the most sufficient and effective option for curbing childhood obesity epidemic. This is due to the fact that current clinical treatment practices mostly aims at controlling this epidemic rather than curing it (WHO 2012; Paxson, Donahue, Orleans & Grisso

2010, 5; Klish, Motil, Geffner & Hoppin 2015; Rippe & Angelopoulos 2012, 149). In addition, obesity treatment costs, including treatment of the associated illnesses, are quite expensive and most families may not be able to afford them. Since childhood obesity is associated with various illness (pulmonary illnesses, cardiovascular illnesses, psychosocial problems, orthopaedic problems, gastrointestinal problems, etc.), treatments that are targeted at childhood obesity should treat or prevent these problems and improve long-term health outcomes. (Xanthakos, Inge, Klish, Jones & Hoppin 2015; Oude, Baur, Jansen, Shrewbury, O'Malley, Stolk & Summerbell 2009; Crocker & Yanovski 2011; ICSI 2013; Skelton, Klish, Lorin, Motil & Hoppin 2015; Rippe & Angelopoulos 2012, 142; Freemark 2010, 339-340; Moreno, Pigeot & Ahrens 2011, 2; Paxson, Donahue, Orleans & Grisso 2010, 4-5.)

New drugs and medical procedures for treating obesity related health problems in adolescents have been developed. However, they are only reserved for extreme obese adolescents (only those with a BMI of ninety-nine point six percentile and above). Some medical procedures and pharmacotherapy management can be used as early as the child is twelve years of age. (SIGN 2010, 6; Crocker & Yanovski 2011; ICSI 2013; Schwarz, Windle & Bhatia 2015.) Nonetheless, the most preferable age in most countries for the medical management of paediatric obesity is sixteen years and above (Cobert B. & Cobert J. 2011, 57; Paxson, Donahue, Orleans & Grisso 2010, 5; Schwarz, W. & B. 2015; Rippe & Angelopoulos 2012, 149). Even though pharmacotherapy and surgical option can be used in the clinical management of severely obese adolescents, still, family-based behavioural techniques are of more importance even after the surgical procedures or even during drug therapy. These family-based behavioural techniques are the changes in diet and physical activity with goals of reducing caloric intake, improving the quality of food intake, and increasing energy expenditure. Achieving long-term success for patients with severe obesity after the medical procedures is most likely to be unsuccessful if the patient does not follow the right diet and exercise therapy. (Xanthos, Inge, Klish, Jones & Hoppin 2015; Klish, Motil, Geffner & Hoppin 2015; SIGN 2010, 44; Crocker & Y. 2011; Oude, Baur, Jansen, Shrewsbury, O'Malley, Stolk & Summerbell 2009; ICSI 2013; Schwarz, W. & B.

2015; Rippe & A. 2012, 149; O'Dea & Eriksen 2010, 195; Freemark 2010, 339-340; Ferry 2011, 222.)

Eventhough the aim of every paediatric nurse should be to manage childhood obesity by preventing it, they should nevertheless be equipped with knowledge on medical management of obesity in children. They can utilize this knowledge when advising and educating families on the management of childhood obesity. Being equipped with this knowledge also portrays a sign of professionalism and creates trust between the nurse and the patient, together with the patient's family at large. Medical management of paediatric obesity can either be through pharmacotherapy and surgical procedures.

5.2.1 Pharmacotherapy management

Pharmacotherapy management in the management of childhood obesity, though very rare, is only recommended for severely obese adolescents. Orlistat is the only medication that has so far been approved in many countries for weight loss in adolescents due to its effectiveness in BMI reductions. It can be used on children of twelve years and above. However, orlistat can cause certain side effects like abdominal cramping, gas in the stomach, oily bowel movements and oily spotting on underwear caused by unabsorbed fat in the feces. It is therefore recommended that patients taking orlistat must take a daily multivitamin supplement as it can interfere with the absorption of fat-soluble vitamins. (Xanthakos, Inge, Klish, Jones & Hoppin 2015; AHRQ 2013; Crocker & Yanovski 2011; Oude, Baur, Jansen, Shrewbury, O'Malley, Stolk & Summerbell 2009; Rippe & Angelopoulos 2012, 148-149 & 156; O'Dea & Eriksen 2010, 197.)

Metoformin has also been used for weight loss in adolescents and has shown effects in BMI reduction. However, it may only be useful in combating weight gain observed in children taking antipsychotic medications and other psychotropic medications. Psychotropic medications are those medications that affects mind, emotions and behaviour. Main adverse effects of metoformin include diarrhea, nausea, vomiting and gas. These effects are however temporary and occur moderately and sometimes mildly. (Xanthakos, Inge, Klish, Jones & Hoppin 2015; AHRQ 2013; Rippe & Angelopoulos 2012, 148-149.)

It is recommended that these medical therapies are used alongside physical, diet and behavioural modifications since they do not produce results without healthy behavioural techniques (Klish, Motil, Geffner & Hoppin 2015; AHRQ 2013; Rippe & Angelopoulos 2012, 148-149). Nurses can apply their nursing intervention techniques in helping patients and their families modify their behaviours by adopting healthy diets, engaging in physical activities thus reducing sedentary lifestyles.

5.2.2 Surgical management

With the rise of childhood obesity, interest in surgical procedures for weight loss for children and adolescents is also increasing. The surgical procedures for weight loss is known as bariatric surgery. Though not the best recommended way of managing paediatric obesity, evidences suggests that bariatric surgery is the most effective and longest lasting treatment for severe obesity including its complications like Diabetes Mellitus 2 (DM2), Obstructive Sleep Apnea (OSA), hypertension, hyperlidaemia, Non-Alcoholic Fatty Liver Disease (NAFLD), etc. These procedures are however not recommended for children of all ages. Nonetheless, they can be performed only on selected severely obese adolescents with a BMI which is greater than or equal to forty kilograms per square meter in addition to suffering from some obesity complications. This is because the risks and complications of the surgeries are great and their long-term safety and effectiveness in children still remains unknown. The only types of bariatric surgery that have been found to be suitable for severely obese adolescents are Roux-en-Y Gastric Bypass (RYGB) and Sleeve Gastrectomy (SG) despite their long-term nutritional complications (e.g. iron, vitamin B12, vitamin D and thiamine deficiencies). This might require the patient to use mineral and vitamin supplements for their entire life. Although Laparoscopic Adjustable Gastric Banding (LAGB) has been used for adolescents on very few cases, it is however not approved for use in people below eighteen years of age because of lack of both short-term and long-term safety and efficacy data for adolescent patients. (Ferry 2011, 221, 231-233; Xanthakos, Inge, Klish, Jones & Hoppin 2015; AHRQ 2013; Schwarz, Windle & Bhatia 2015; ICSI 2013; Rippe & Angelopoulos 2012,

149; Treadwell, Sun & Schoelles 2008; Michalsky, Reichard, Inge, Pratt & Lenders 2012; Crocker & Yanovski 2011.)

Not all severely obese adolescents qualifies for bariatric surgery even if they quest for it. Bariatric surgery is performed only on selected severely obese adolescents and it is not recommended to be performed for preadolescent children; for any patient who has not learned and does not practice the principles of healthy dietary and activity habits; and for those with unresolved eating disorder, untreated psychiatric disorder, or Prader-Willli Syndrome (PWS). Pregnant, breastfeeding adolescents and those planning to become pregnant within two years of the bariatric surgery are also not considered candidates for bariatric surgery. PWS is the most commonly known genetic cause of life threatening obesity in children. (AHRQ 2013; Schwarz, Windle & Bhatia 2015; ICSI 2013; Rippe & Angelopoulos 2012, 149; Treadwell, Sun & Schoelles 2008; Michalsky, Reichard, Inge, Pratt & Lenders 2012.) Even though doctors decide the type of surgery suitable for the paediatric patient, it is advisable that nurses are equipped with the basic knowledge of the available types of bariatric surgery as they might find themselves in situations whereby they may have to explain these to patients and their families.

RYGB involves the reduction of the size of the stomach. In this procedure, a small stomach pouch is created, and the duodenum is bypassed or avoided. This, in turn, reduces greatly the amount of food that can be eaten at a time. It is known to work best for severely obese adolescents and results into best outcomes regarding weight loss and solutions for the related illnesses. Adolescents lose approximately fifty percent to eighty-five percent of their excess body weight with nearly complete recovery of the related illnesses. Complications most likely to occur include intestinal leakage, wound infections, pulmonary embolus, small bowel obstruction, malnutrition and malabsorption among others. (Xanthakos, Inge, Klish, Jones & Hoppin 2015; AHRQ 2013; ICSI 2013; Crocker & Yanovski 2011; Schwarz, Windle & Bhatia 2015; Rippe & Angelopoulos 2012, 149; O'Dea & Eriksen 2010, 197-198; Ferry 2011, 234; Treadwell, Sun & Schoelles 2008; Michalsky, Reichard, Inge, Pratt & Lenders 2012.)

SG, on the other hand, is an incoming bariatric procedure and works well in well-selected adolescents. While its short-term outcome looks promising, its long-term data in adolescents is still lacking. Complications that may occur include heightened and prolonged nausea in the first month of the surgery. (Xanthakos, Inge, Klish, Jones & Hoppin 2015; AHRQ 2013; ICSI 2013; Ferry 2011, 221-234.)

6 DISCUSSIONS AND RECOMMENDATIONS

This chapter discusses the thesis and its findings, including the nurses' roles in the management of childhood obesity. It also gives a suggestion based on the findings as well as a recommendation for further studies. As shall be seen in the next chapter, this thesis is a descriptive literature review and its findings are not presented for further analysis and arguments.

6.1 Discussions

Paediatric obesity, also referred to as childhood obesity, basically means obesity in children. It is a medical condition that occurs when excessive fat accumulates in the body over a long period of time due to energy imbalances. This results into several health, psychological and social problems in addition to affecting many systems of the body including cardiovascular system, pulmonary system, gastrointestinal as well as orthopaedic. Some of these consequences are long-lasting and tracks into adulthood thereby increasing the risk of worsening those diseases later in life thus shortening the lifespan of children. It is therefore important that the risk factors of this disorder in children are known and understood as well as its management as they play important roles in its prevention. (Moreno, Pigeot & Ahrens 2011, 43; Birch, Parker & Burns 2011, 1.) Among the risk factors of childhood obesity, the learned behaviours and habits is the major contributor to obesity in children. Children adapt behavioural habits from their families. They learn from their parents and guardians and believe that their parents are always right. It is also in the family that they pick up the elementary dietary and lifestyle habits and receive the first guidance that influences their health, fitness and wellbeing. (Moreno, P. & A. 2011, 10.) Parents and guardians influences the lives of their children in many ways beginning from the day they are born. It is therefore important they are role models to their children in their behaviours and habits.

Even though other factors might also contribute to childhood obesity, parental influence in form of behaviours and habits play a very important role. Parents should not only teach their children how to live healthy lifestyles but should also be living examples of what they teach them. If parents teach their children how to

live healthy lifestyles, they will live by that despite any pressures. It is argued that television advertisements of unhealthy foods contributes more to childhood obesity and has the capacity to influence children into unhealthy eating. If parents teach and influence their children into healthy eating and lifestyles, despite the pressures, they will learn and adapt the healthy ways. Children are exposed to thousands of advertisements out there through billboards, in the markets, posters, internet, etc. These may influence their dietary habits. However, if parents teach them how to intelligently respond to such advertisements and equip them with the ability to recognize the ways in which other things may be affecting their choices then they end up making healthy choices (Moreno, Pigeot & Ahrens 2011, 9-16; Tesmeer, Beecher & Hagen 2011, 10). For this reason, it can be argued that parents have the ability to control and prevent their children from developing this medical disorder.

The best and recommended way of managing this disorder in children is by preventing it through promotion of healthy eating and being physically fit in children (Schwarz, Windle & Bhatia 2015; Klish, Motil, Geffner & Hoppin 2015). Paediatric nurses also play a very important role in the managing of childhood obesity by identifying obese children or children who are at risk of being obese since they monitor these during post-natal visits. They should advise parents accordingly through their nursing interventions (see chapter 5.1), depending on the situation of the child. The recommendations for preventing childhood obesity are almost similar to strategies used for treating those children who have already developed it (Klish, M., G. & H. 2015; Lehman 2014; Moreno, Pigeot & Ahrens 2011, 3 & 7; Treadwell, Sun & Schoelles 2008; SIGN 2010, 6; Schwarz, W. & B. 2015; Kiess, Wabitsch, Maffeis & Sharma 2015, 172; Bagchi 2011, 319; O'Dea & Eriksen 2010, 196) in the sense that they are based on multifactorial interventions and parental involvement plays a very important role regardless of the management approach used.

Although early surgical interventions for extremely obese children provides the best chance to reverse the existing illnesses (Ferry 2011, 222), it still stands out as not the best recommended way to treat or rather manage childhood obesity. Moreover, it may not be the best choice for the paediatric patient as some paediatric bariatric patients may later regret the decision to undergo the surgery

(Treadwell, Schoelles & Sun 2008). Also, considering the side effects that comes with surgical procedures and pharmacotherapy interventions, it may be argued out that this is not the very best way of managing childhood obesity. Furthermore, the medical solutions for managing childhood obesity only aims at bringing the problem under control rather than curing it (WHO 2012; Schwarz, Windle & Bhatia 2015; Rippe & Angelopoulos 2012, 149). In addition, obesity treatment costs, including treatment of the associated illnesses, are quite expensive and most families may not be able to afford them (Moreno, Pigeot & Ahrens 2011, 2; Paxson, Donahue, Orleans & Grisso 2010, 4-5). In this case, nursing interventions are considered the safest interventions for the management of childhood obesity. Since children have very limited capacity in making their own decisions and that their parent and guardians make decisions and choices for them, it is the responsibility of parents to ensure that they put into practice the multifactorial interventions provided by their nurses.

6.1.1 Nurses roles in paediatric obesity management

Paediatric nurses play a vital role in the management of paediatric obesity starting the time a child is born. They assess the child, weigh them, calculates their BMI and documents each measurement as soon as the child is born. This continues until the child is eighteen years of age. This way, they are able to recognize, earlier enough, any developing health issue in an increase in BMI and take early measures in its management before it gets worse (Milligan 2008).

Nurses also play a key role in educating parents about childhood obesity- causes and risk factors, effects and consequences as well as its management. It is recommended that this education starts when the child is born or even when the mother is pregnant since the mother's unhealthy eating habits while pregnant is a risk factor for childhood obesity. This kind of education can be done during ante-natal visits or when they realize that a child is at a risk of obesity. During this education, the nurses can also assess the parental perceptions on obesity since parental recognition and acceptance is the first step in the management of childhood obesity (Kouta & Lazarou 2010). Through multifactorial interventions, nurses should teach parents on healthy dietary habits and the importance of

engaging their children in physical activities for at least sixty minutes daily as recommended by WHO (WHO 2012).

In a clinical setting, nurses can also promote healthy lifestyle patterns that reduce the risks of being overweight or obese. These can be done in pre and post-natal care clinics, or can even be done by organizing educational days at the clinics for parents. Regardless of the cause of the childhood obesity, the nurses need to have an understanding of the patient's needs and collaborate with other healthcare providers in a multi-professional team in discussing the best way of managing the patient's situation at hand (Kouta & lazarou 2010). They assess the level and type of prevention which is most appropriate for the child and his or her family (Berkowitz & Borchard 2009).

In the management of this disorder, the nurses apply their nursing intervention skills and approaches in tackling it. They engage parents in the prevention activities and encourage parenting styles that support increased physical activity and reduce sedentary behaviours (Kouta & Lazarou 2010). It is essential that the approaches nurses take in the management of childhood obesity considers a whole range of dire factors. They need to have an understanding that sometimes, improving children's health might be difficult for some parents due to various circumstances like culture, socio-economic status, environment, etc. (Berkowitz & Borchard 2009.) Prevention, early detection and the appropriate treatment of childhood obesity are of great importance in all settings of nursing practice and should not be devalued in any way by any nurse (Kouta & L. 2010).

6.2 Recommendations

The findings of this thesis are neither presented nor reported for further arguments nor analysis since the thesis is a descriptive literature review. Nevertheless, this thesis recommends that in cases where a child is already obese, or are at a risk of being obese, and parents or guardians are showing no efforts nor interest in helping them, nurses should take the responsibility of helping the child. Besides educating and encouraging families on behavioural change, healthy diet and regular physical activities, nurses can organize such activities and keep track of the participants. This way, they are easily able to identify those children who are

not actively participating, as this will help figure out how to help them further. This thesis also suggests that further studies should be done to find out the best ways in which nurses can take responsibilities in helping obese children or those children who are at a risk of obesity and comes from those families that are reluctant in helping them.

7 CONCLUSIONS

Obesity, if not well managed, is a chronic disease that requires a lifetime attention to healthy eating and an active life style beginning from the day a child is born. Since effective treatment of this health condition is limited for children, preventing it is the most appropriate and excellent therapy. Early recognition of excessive weight gain is important and should be closely monitored by paediatric nurses as well as other paediatric healthcare providers. This is because early prevention is more effective in managing this epidemic than treating it after its occurrence. Healthy eating and increased physical activity must be encouraged, promoted, and prioritized in order to protect children from this condition because they are considered to lower the risk of becoming obese and developing the obesity related illnesses. Childhood obesity prevention is important as it will not only keep the child healthy but also reduces the costs incurred in its treatment and in the treatment of the illnesses that results from it. Preventing it is the most sufficient option for curbing it owing to the fact that current clinical treatment practices aims at controlling it other than curing it. Early prevention is very essential and so it is advisable that nurses create its awareness to parents as soon as the child is born, or whenever they notice that a child is at obesity risk.

A successful obesity management interventions and treatment programmes should include behaviour change modules, be family based- involving at least one parent and should aim to change the whole family's lifestyle. This is because any intervention is unlikely to succeed if it does not involve the understanding, support, and active participation of other family members, more so the parent(s). Such programmes and interventions should target healthy dietary intake, increasing levels of physical activity and decreasing sedentary behaviours. They should be aimed at preventing the long term obesity complications and should not only target a short term prevention but enhance a lifetime quality of life. Although no one treatment program has been recommended to be the best in its management, the nurses' multifactorial interventions have been approved to be the best in managing this disorder. This combination of interventions is also used along with pharmacological and, or, surgical intervention management. Even though surgical management is used on the selected extreme obese adolescents, it is still not the best option to be used on children since they are still developing

both physically and mentally and may not have enough capability to surgical consent. Besides the serious complications that comes along with it, the surgical management may thus change their lives in a considerable way and some may regret later in life why they underwent the surgery.

As children's behaviours are often shaped by observation and adaptation, parents are advised to live and promote a healthy lifestyle by providing their children with healthy foods and opportunities for physical activity. Their involvement is also an important part of childhood obesity management since children and adolescents have very limited ability to understand the long-term consequences of their behaviour. Parents should take an initiative of equipping their children with knowledge on healthy eating and regular exercise as this will enable them to act responsibly out there and make healthy choices as teen agers and as adults. Parents should also take initiatives of making regular visits to their healthcare centres and act on the feedback from their paediatric nurses regarding the health of their children. This will help prevent the occurrence of this disorder.

Childhood obesity is rising worldwide and has serious health consequences on the individual including short lifespan in adulthood. It is therefore the duty of every parent, nurse and other paediatric healthcare providers to take initiatives in the prevention of this disorder in children. In addition, nurses should educate families on the causes, risk factors, effects as well as the consequences of paediatric obesity. Understanding the complex factors that contributes to childhood obesity is vital for health improvement of the world's future generations as this will help in its management by preventing it.

Be active, eat healthy!

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