

# Obesity prevention begins at home – parents and nurses, partners in the fight against childhood obesity.

## A literature review on the prevention of childhood obesity

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Abstract <p>As childhood obesity became the 21st century's major contributor to the development of many illnesses, dealing with overweight and obese patients/clients may pose as a great challenge for today's nurses. Hence, this literature was conducted, firstly, to find effective strategies that could be used by nurses to help patients/clients and families in the prevention of childhood obesity. Secondly, the purpose was to investigate parental influences on children's eating behaviors in order to identify its importance against obesity and finally, to find evidence to support this paper's argument that obesity prevention begins at home.</p> <p>Data were searched systematically from MEDLINE, COCHRANE and CINAHL. The findings showed that preventing childhood obesity will require multifaceted and community-wide programs and policies, with parents having a vital role to play. Preventions such as reduction of fatty food intake, increased physical activity, minimized television viewing and computer usage, and facilitation of a supportive family environment. Behavioral changes seemed to be the cornerstone of preventing obesity in children. Nursing intervention efforts are more effective when nurses educate, give support and work directly with parents from the earliest stages of a child's development.</p> <p>This literature review was conducted in conjunction with the European Union's PoHeFa (Policy Health and Family Learning) project 2008-2012. Information gathered by this thesis will be used to develop effective interventions and educational programs that address childhood obesity.</p>		
Keywords obesity prevention, childhood obesity, parental influence, nursing role		
Miscellaneous Appendix 1		



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Työn nimi LIHAVUUDEN ENNALTAEHKÄISY ALKAA KOTOA – VANHEMMAT JA HOITAJAT KUMPPANEINA TAISTELUSSA LASTEN LIKALIHAVUUTTA VASTAAN – Kirjallisuuskatsaus lasten ylipainon ennalta ehkäisystä		
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Tiivistelmä Lasten lihavuudesta on tullut 2000-luvun uusi ilmiö, johon liittyy potilaiden ylipainoisuus. Tästä on tulossa suuri haaste hoitohenkilöstölle. Tämä kirjallisuuskatsaus tehtiin, jotta voitaisiin ensinnäkin: löytää tehokkaita keinoja joita hoitajat voisivat käyttää auttaakseen potilaita ja perheitä ehkäisemään lapsuusajan lihavuutta. Toiseksi, selvittää vanhempien vaikutus lasten syömiskäyttäytymiseen, jotta voidaan tunnustaa sen tärkeys. Viimeiseksi, löytää tutkimustietoa siitä, että lasten lihavuuden ennaltaehkäisy alkaa kotoa.  Tietoa etsittiin systemaattisesti MEDLINE:sta, COCHRANE:sta ja CINAHL:sta. Huomattiin, että lapsuusajan lihavuuden ehkäiseminen vaatii monitahoista ja yhteiskunnallista työtä, jossa vanhemmilla on keskeinen rooli. Ennaltaehkäisy, kuten vähentäminen rasvaisen ruuan syönni, lisää fyysistä aktiivisuutta, vähentää television katselua ja tietokoneen käyttöä ja luo hyvän perheympäristön. Käyttäytymisen muuttuminen näytti olevan lasten lihavuuden ehkäisemisen kulmakivi. Hoitohenkilöstön työ on tehokkaampaa kun hoitajat kouluttavat, antavat tukea ja työskentelevät vanhempien kanssa lapsen syntymästä saakka.  Tämä kirjallisuuskatsaus on tehty yhdessä Euroopan Unioni PoHeFa ( Policy Health and Family Learning) projekti 2008-2012 kanssa. Tässä opinnäytetyössä kerättyä tietoa tullaan käyttämään, jotta voidaan kehittää uusia työkaluja ja opetuksellisia keinoja, joka liittyvät lasten lihavuuden ennaltaehkäisemiseen.		
Avainsanat (asiasanat) lihavuuden ehkäisy, lasten lihavuus, vanhempien vaikutus, terveyskasvatus, hoitotyön rooli		
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# 1 INTRODUCTION

According to Golan and Crow (2004, 357), obesity is a global problem with significant medical, psychosocial and economic consequences. Due to its serious consequences to children's health and well-being, childhood obesity is now considered an epidemic that is currently recognized worldwide as a serious public health dilemma. This year over 42 million children globally under the age of five are overweight (WHO, 2010). Childhood obesity affects all aspects of a child's life. It is proven to cause multiple health problems especially to those who have been obese since early childhood. These health problems range from physical and psychological to social problems. The physical health problems range from type 2 diabetes, high blood pressure, heart disease, asthma, sleep apnea and certain types of cancer (Barba, Troiano, Russo, Strazzullo & Sian, 2006). The psychological problems range from depression, low self-esteem, behavioral problems to other mental disturbances (McKay & Huntington, 2005). Discrimination, stigmatization and bullying are the social consequences (Carr, Friedman & Jaffe, 2007). Apart from the above mentioned problems, healthcare expenditure due to obesity and its related illnesses runs in billions. It has been proven that illnesses and health problems related to obesity are more likely to occur in adulthood as a consequence of being obese as a child (Rowland & Coffey, 2009).

Nurses, who are often the first point of contact in hospitals, clinics and communities have an integral role to play as they have the opportunity to assess families and children for factors associated with obesity (Gance-Cleveland, Sidora-Arcoleo, Gottesman & Brady, 2009, 222). As a student nurse, I am aware that nurses' responsibilities are many and varied – whether it is direct or indirect care. The International Council of Nurses' Code of Ethics for Nurses (ICN, 2010) indicates that nurses have four fundamental responsibilities - these are to promote health, to prevent illness, to restore health and to alleviate suffering. Nurses are expected to render healthcare services to individuals, groups, families and the community. These involve coordinating the work with other healthcare professionals involved in patient care and liaise with the patient's family. This is when the nurse's education and health promotion responsibilities become evident, such as teaching patients how to

manage their illness and to remain healthy during and after institutional care (Fry & Johnstone, 2006).

With obesity's multiple contribution to poor physical and psychological health as well as its economic consequences, this thesis will argue that prevention efforts should begin at home targeting parents as the primary agents in curbing the growth of obesity. Prevention efforts should shift their focus on parents and healthcare professionals, nurses in particular, so that they would be more involved in working together in achieving this goal. I believe that obesity begins at home and that parents have the capabilities to prevent their children from becoming obese. Through the guidance of healthcare professionals, parents will gain more knowledge once they are given the correct education and information that will help them empower to make healthy choices and to practice healthy lifestyle. Thus, the prevention of obesity must be started as early as possible in life and must be given the highest priority.

## **2 DEFINITION OF OBESITY**

### **2.1 What is obesity?**

As described by the World Health Organization (2010), obesity means having an excessive amount of body fat due to an imbalance between intake and elimination of the excess. Werner and Bodin (2007, 536) explained that childhood obesity is a condition where excess body fat negatively affects a child's health or well-being. It is considered a medical condition because it has an adverse effect on human health. Evidence from several studies confirms that many children eat generous servings of food with high fat and calorie content and do not receive enough regular exercises. The excess fat that has accumulated in the body can cause serious illnesses which could lead to reduced life expectancy (Clark, 2007).

To this date, children and adults alike suffer from several chronic health conditions due to obesity. Children often suffer from asthma, diabetes, cardiovascular diseases

and many other obesity related illnesses (King, Meadows, Engelke & Swanson, 2006, 145). Sabbah and Haleama (2009) reported that children often suffer from bullying and teasing by their peers as a consequence of being obese. Some are harassed while others are discriminated against by their schoolmates and even by their own family members (Story, Neumark-Stzainer, Sherwood, Holt, Sofka, Trowbridge & Barlow, 2002, 210). Most of these obese individuals have experienced marginalization and stereotyping by society. People assume that obese individuals are lazy and eat too much food. This stigmatization has made the obese individuals develop low self-esteem and depression. It is of paramount importance to identify these children who are at risk of developing obesity. Currently, the diagnosis of obesity in children is often based on Body Mass Index or BMI. A person has traditionally been considered to be obese if he or she is more than 20 percent over the ideal weight.

## **2.2 Assessing Obesity**

The Body Mass Index (BMI) is currently used worldwide as the most accurate method in assessing obesity. Obesity and overweight are officially identifiable by using this method - a scale that identifies healthy, overweight and obese weight ranges. According to the World Health Organization (2010), this method is acceptable for determining obesity with children of two years of age and older. The BMI, a key index for relating body weight to height is a person's weight in kilograms (kg) divided by their height in meters (m) and squared. That ideal weight must take into account the person's height, age, sex and build. A child is considered obese if he/she has a BMI of 30 and above. This method is recommended by the World Health Organization as the most effective measurement in assessing adults and children's weight.

Unlike other developed nations, Finland still uses the traditional growth chart until the child's height growth has ceased. The Body Mass Index can be used for adolescents who have reached their final height. The diagnosis of being overweight and obese in childhood is based on determining the child's weight for height expressed as a percentage deviation of weight from the median weight for height and sex (Salo, Angle, Kaukua, Ketola, Kimulainen, Lipsanen-Nyman, Nuutinen, Pere,

Vanhapeto and Veijola, 2005). Salo et al. (2005) explain that a child is considered overweight if the child's weight for height before school age is 10-20% higher than the median or 20-40% higher at school age. The child is considered obese if the corresponding figures are over 40% as illustrated by TABLE 1.

**TABLE 1** BMI Classification of overweight and obesity ( *Mustajoki, 2010*)

BODY MASS INDEX	CLASSIFICATION
13-18	Underweight
19-24	Normal weight
25-30	Overweight
30-40	Obese
40 +	Severely Obese

### **3.0. CONTRIBUTING FACTORS TO CHILDHOOD OBESITY**

#### **3.1 Lifestyle preferences**

As many other health conditions, childhood obesity can be brought on by a range of factors which often act in combination (Vanhalo, Korpelainen, Tapanainen, Kaikkonen, Kaikkonen, Saukkonen, Keinänen-Kuukanniemi, 2009, 99). A defect in genes cannot be blamed alone in the development of obesity. Several studies have suggested that obesity is attributed to many factors including genetic, biological, sociocultural and demographic ones. The World Health Organization (2010) estimated that there are around 20 million children worldwide under the age of five years who are overweight. Dietary intake plays a major role in the development of obesity because of the increase in excess weight gain is due to a global shift towards fatty diets and an increased intake of food low in vitamins. Evidence from Europe, America, Australia, Canada and other developed nations suggests that people are consuming foods high in saturated fats and high in sugars.

The majority of the younger generation do not follow the dietary guidelines of the Food Guide Pyramid even though they have been taught early on at school about the importance of the food pyramid (Reinaerts, de Nooijer, Candel & de Vries, 2007, 252;



Werner & Bodin, 2007,536; and Nakade, Su Lee, Kawakubo, Kondo, Mori & Akabayashi, 2008, 88). Many studies indicate that an **inadequacy of fruits and vegetables consumption** among young children is common in overweight and obese subjects.

However, Vanhala et al. (2009, 100) discovered in their study of 1278 Finnish children that the consumption of sweet beverages and snack foods did not differ between normal weight and obese children. The majority of the subjects consumed similar amounts of fats used in meal preparation at home or in the fat content of milk. According to these authors, overeating and skipping breakfast remained independent risk factors for childhood obesity. During the study, their subjects ate the same types of food but excess weight seemed to be evident in children who tended to skip breakfast and who consumed big amounts of servings. These authors concluded that overeating and skipping breakfast have contributed to obesity. It can be concluded that normal weight can be achieved and maintained if eating in moderation is practiced.

Nakade et al. (2008, 87) have an opposing discovery when they conducted a study in Japan about food intake associated with body weight. There was a significant reduction in BMI, weight loss and blood pressure reduction among the 506 overweight/obese subjects when their diets shifted from "sweets, meats, dairy products and alcohol" to "plant foods and seafood". They discovered that the quality of food was far more important than the quantity. In this study, it was apparent that poor and unhealthy diet had contributed to the subjects' increase in weight and their obesity related problems. Plant foods such as fruits and vegetables, grains combined with seafood which is low in fats, helped significantly in weight reduction.

Wardle, Carnell and Cooke (2005, 232) also reported that children who consumed five or more daily servings of fruit and vegetables can achieve healthy growth and prevent chronic disease from developing. This is further supported by the results of the study conducted by Huus, Brekke, Ludvigsson and Ludvigsson (2009, 144) which revealed that frequencies of the intake of cheese, chocolate and lemonade were positively associated with overweight and obesity in children from 2.5 to 5 years.

Literature seems to confirm that **diet plays a significant role in the development of obesity**. Furthermore, sedentary lifestyle and physical inactivity contribute just as much.

**Physical inactivity is a major element in the development of obesity** in the western societies. Children are doing less exercise and becoming less active. Authors like Loprinzi and Trost (2009, 129); Collin, Simmons, Sanigorski, Kremer and Swinburn (2008); Gunner, Atkinson, Nichols and Eisa (2005) suggest that sedentary lifestyle is due to children's increase usage of computers, television viewing, boredom and lack of motivation. Although physical education is provided in schools, the time spent in exercising is not sufficient. Findings in the United Kingdom, Australia, and America and in many other developed countries show that there is a significant association between hours of television viewing and the incidence of obesity. Evidence suggests that watching many hours of television and using computers decreases the time spent on outdoors activities such as running, biking, swimming, and playing games and sports.

Sedentary lifestyle has been proven to contribute to the development of the obesity epidemic (Loprinzi & Trost, 2009, 129). Several studies conducted over the years in the United States, Australia, Europe and the United Kingdom have revealed that keeping small children active is an essential part of preventing childhood obesity. These studies show that the more time children spend outdoors, the higher are their activity levels, and therefore, the lower the risks of accelerated weight gain and excess adiposity. According to Sheehan and Yin (2009), children with normal weight are more physically active in comparison to children who are overweight. Sufficient evidence from the literature shows that the majority of overweight and obese children have parents who are physically inactive. Children with parents involved in sports and outdoor physical activities tend to be active as well. It is has also been noted that **children with physically inactive parents receive less encouragement and support from their parents to engage in physical activities**.

### 3.2 Sociocultural factors

The role of the family has been highly documented as one of the many contributors of the obesity epidemic. The **fast-paced society** had pushed many families to consume processed, ready-made food bought from the supermarkets. Parents buy take-away foods for their children and often consume many of their meals outside of the home. Studies indicate that the majority of fast foods are high in fats, contain preservatives and are low in vitamins. Increased consumption of these foods can lead to obesity and obesity related diseases.

These days, the majority of parents are both working, mothers in particular, work eight hours a day. This means that less time is spent on preparing healthy meals at home. The parents are exhausted from work and tend to have less time for preparing healthy meals and spending an hour or more exercising with the children. A study in America concluded that there is a link between working mothers and childhood obesity. Children aged from 5 to 7 years old with mothers working full-time are more likely to develop excess weight problems (PHYSorg.com, 2007).

As the stresses caused by working life and the fast-paced society has increased, parents have neglected this area of good parenting - providing healthy food for their children and ensuring that they have enough exercises. However, evidence from studies performed in America has shown that many non-working parents tend to have overweight and obese children. Hesketh, Waters, Green, Salmon and Williams (2005, 19) identified that this could be attributed to the parents' lack of knowledge about healthy food. They tend to prepare meals which are not suitable for growing children. However, some authors argue that it is not about parents having lack of knowledge but that the lack of resources for purchasing healthy meals has contributed to the problem. These parents cannot afford to purchase foods that are sufficient for young children's dietary needs (Gunner, Atkinson, Nichols & Eissa, 2005).

In many other developed nations, overweight and obesity problems are equally common in both working and non-working parents' families (Hesketh et al.2005, 25).

Some authors argue that these problems are also apparent in higher income or above middle class families, particularly in some parts of Asia. These parents are able to indulge their children with eating outside of the home and buying take-away western style meals such as provided by McDonald's, Kentucky Fried Chicken, Pizza Hut and many others. The same results were also found in studies from Australia, New Zealand and the United Kingdom. Many children with weight problems have educated parents who are working and earning substantial amounts of salaries. Thus, income does not seem to be a factor in some countries.

### **3.3 Demographic factors**

In spite of what was stated above, there is sufficient evidence that poor neighborhoods have contributed to childhood obesity. Families cannot afford to buy healthy foods as healthier foods are more expensive in comparison to those that are unhealthy. Children in poor neighborhoods rarely spend time playing outdoors because of poor playground facilities. Safety is another factor because parents deter their children from playing outdoors due to high crime rate. These problems seem to be more common in America and the United Kingdom where the majority of families who reside in poor neighborhoods are from Hispanic, Spanish and African backgrounds. A question was raised whether genetics play a role in obesity. Many authors have identified that overweight and obesity is much more significant in some ethnic groups, particularly in those populations mentioned above. Thus, ethnicity must be taken into account when assessing the Body Mass Index.

Genetic disposition was found to be associated with obesity (Clement, 2006,). Some studies indicate that a person may possess a gene type which could make them more susceptible to excess body weight. This may become apparent when these individuals are exposed to an affluent lifestyle. However, a significant effect on weight and obesity susceptibility will become apparent when these individuals practice sedentary lifestyle with minimal physical activity and consume high-calorie foods. For example, the aboriginals in Australia, the Pima Indians in Arizona, the

Maori in New Zealand and the American Samoan in an urban environment (WHO, 2010).

Age is another factor to consider when assessing obesity as it seems to slightly contribute to an increase in BMI as the subject gets older. Several studies have confirmed that men and women tend to gain more weight as they become older, particularly around the age of 50 to 60 years. However, studies in Finland reveal that the upward trend has been the most prominent in the youngest age group (25-34 years), both in men and women (Finnish National Public Health Institute, 2006). Women generally have a large prevalence of obesity in comparison to men as they tend to gain excess weight during and after pregnancy. Some lose these excess fats but others do not. Some authors have identified that the level of education is a strong determinant of normal weight in women (Finnish National Public Institute, 2006).

This is evident in the Finnish figures taken from 1982 to 2002, which showed that the most unfavorable trends in obesity were common among women with low education. Even though an increase of BMI in male population has been noted regardless of education, the less educated participants were noted to have a much higher BMI. Knowing these several contributing factors to obesity will significantly help healthcare providers in finding ideas on how to tackle obesity related issues and problems.

## **4 OBJECTIVES OF THE RESEARCH**

The objectives of the thesis were: firstly, to identify effective strategies that could be used by nurses to help clients and families become more knowledgeable about obesity and healthy lifestyle and to investigate parental influences on children's eating behaviors in order to identify its importance against obesity. Finally, an objective was to find evidence to support this paper's argument that obesity prevention begins at home.

### **RESEARCH QUESTIONS**

1. Is/Are parental influence(s) the most influential factor(s) on children's early eating habits?
2. What are the nursing strategies and interventions to help parents become more knowledgeable about obesity and healthy lifestyle?

## **5 DATA COLLECTION AND ANALYSIS**

The related literature was searched from online databases and manually from several nursing and healthcare journals. The search terms “obesity prevention”, “childhood obesity”, “parental influences”, “health education” and “nursing role” were used. CINAHL, COCHRANE and MEDLINE were the databases used for the data collection. The article titles were examined whether they met the selection criteria and only articles that filled the selection criteria were included. For this review, only articles that had the following characteristics were included:

- The study was an item of empirical research.
- The study had relevance to the topic of the review.
- The study was published between the years 2002 to 2010.
- The study had some relevance to the nursing field.

Other known online resources were also utilized. A Google ([www.google.com](http://www.google.com)) search was conducted to identify government approved web-based resources and their links

which provide information on childhood obesity prevention. Several guidelines were identified from different health organizations and used by this thesis as additional resources to identify nursing strategies. The collection of data took place from the 15<sup>th</sup> of March until the 15<sup>th</sup> of May 2010.

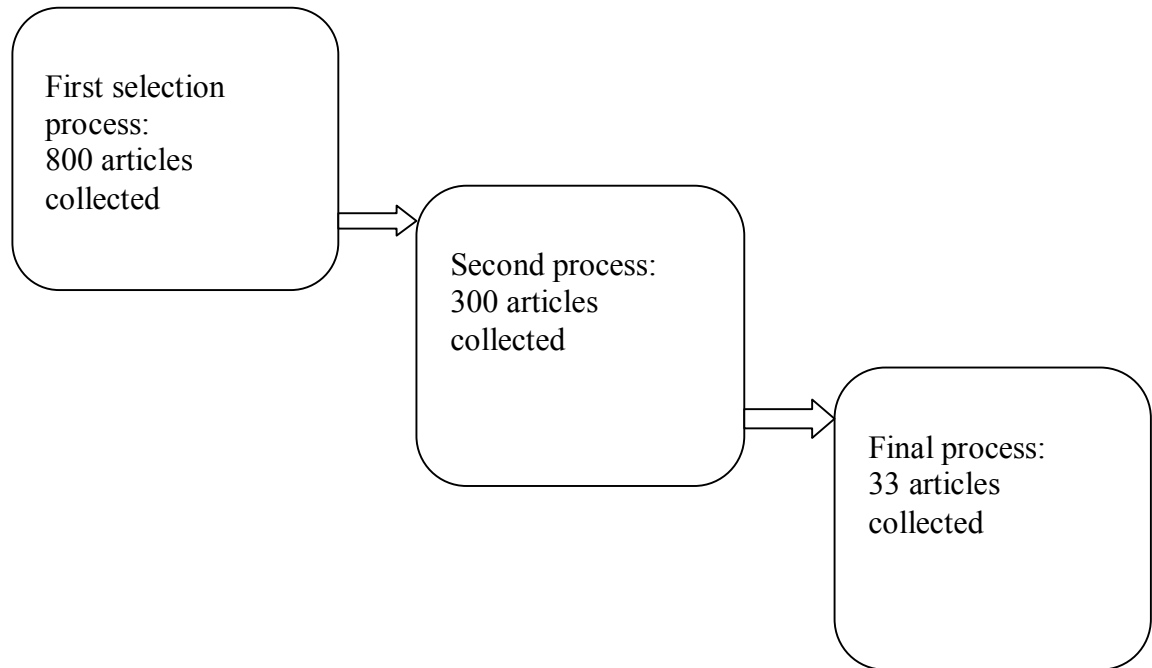


FIGURE 1. Articles collection process.

As illustrated by FIGURE 1 above, the first collection process was performed by gathering articles according to their approved title. There were 800 articles gathered based on the title alone. Then, based on their abstracts, the second process was performed. Less than half of the articles remained after the second process. Lastly, the remaining articles were read and thoroughly checked. Many were found to be unsuitable for the review, thus these articles were excluded. There were also articles that could not be accessed in full text, so these articles were removed and excluded. Altogether, 33 articles were chosen for the review. These articles were read, scrutinized and analyzed. Summaries of the articles can be found in Appendix 1. Further information of articles is shown in the TABLE 2 below.

TABLE 2. Research articles included in the review.

Journal	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Acta Paediatrica								1		1
Child & Family Studies							1			1
Health Promotion International				1						1
Journal of Advanced Nursing	1									1
Appetite					1	2	2		1	6
American Journal of Public Health			1							1
Pediatrics	2									2
Preventive Medicine									1	1
Journal of School Health					1					1
American Journal of Preventive Medicine								1		1
Journal of the American Dietetic Association								1	1	2
European Journal of Clinical Nutrition							1			1
Journal of Adolescent Health						1				1
Journal of Adolescence					1					1
Obesity Research			1							1
Obesity Research & Clinical Practice								1		1
Journal of School Health					1					1
Journal of Human Nutrition Dietetic						1				1
Public Health Nutrition					1	1				2
Journal of Pediatric Health Care								1		1
Environmental Health and Preventive Medicine	1									1
The European e-Journal of Clinical Nutrition and Metabolism									1	1
Nutrition Research						1				1
Journal of the American Dietetic Association									1	1
Journal of the American Academy of Nurse Practitioners					1					1
<b>Total</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>33</b>



## 6 FINDINGS

### 6.1 Obesity Prevention in Finland

During the last few decades, researchers have performed multiple studies in order to find out the contributing factors of childhood obesity and how to prevent it. These studies reveal that there are several causes of childhood obesity – some are modifiable while others are not (Stewart et.al, 2008). The modifiable factors have been suggested to be a major avoidable contributor to the costs of illnesses and morbidity (WHO, 2010). Despite decades of attempts to prevent childhood obesity, health problems related to obesity have continued to rise worldwide. Among these countries are the United States, Australia, Canada, New Zealand, China and other parts of Asia. Obesity has also increased in the Latin American countries, as well as in the European countries.

As documented by the literature, countries in the European region are not immune to the increasing health problems caused by obesity. The prevalence of childhood obesity has been steadily increasing (WHO, 2010) in a number of European countries, including Finland. Childhood obesity poses a great challenge to the European healthcare system. Even though the majority of European countries member states have government – approved policies on food safety and nutrition, the burden of illnesses associated with obesity has significantly increased (WHO European Health & Policy, 2007). Despite Finland's high standard healthcare system, the country shares similar health challenges related to obesity as in other developed countries.

As mentioned above, lifestyle preferences, sociocultural and demographic factors have all contributed to the development of the obesity epidemic amongst children. It is vital to take these factors into consideration when finding intervention strategies to prevent children from becoming obese. Finland, just like any other country affected by obesity has developed intervention strategies in conjunction with the country's guidelines established by the government responsible. Current prevention of obesity in Finland is the responsibility of the local governments. This is in

accordance with the Primary Health Care Act (66/1972). To improve the health of the Finns, a wide variety of measures have been imposed on schools, media, mass catering, health care sectors, legislation and government policies to improve the health of their people.

The Karelia Project in Finland during the early 70's made a significant change in the health of many Finns (Roos, Lean & Anderson, 2002). Since then, heart diseases and other heart related illnesses have decreased significantly due to changes in diets and lifestyles. The Finns are well aware that a balance diet and daily exercise promote healthy body and mind, and being overweight and obese can contribute to the development of some illnesses. Changes in diet and lifestyle have been promoted nationwide following the interventions used in the Karelia project. However, despite the nationwide education, obesity problem in Finland is steadily increasing. Although not as rapid as in other nations, it is a cause for great concern as it is highly related to diabetes.

There are around half a million Finnish who suffer from type 2 diabetes (Vanhala et al, 2009). Diabetes has many serious health effects, but can be prevented with sufficient physical activity and a healthy diet (Philipsen & Philipsen, 2008). The World Health Organisation (2010) estimates that as much as 90 percent of type 2 diabetes can be prevented through eating healthy food and taking regular exercises. However, it has been noted that physical inactivity is on the increase particularly among children and young people. This is of particular concern because overweight and obesity are linked with diabetes and other health problems. The National Nutrition Council, the Committee for Health-Enhancing Physical Activity and the Ministry of Social Affairs and Health, have worked together in drawing up a concrete plan for the implementation of the different target areas for the year 2008-2011. The current prevention measures of overweight and obesity in Finland include increasing physical activity, reducing the time spent watching TV or playing computer games and guidance towards recommended eating habits (Salo et al. 2005). The TABLE 3 below summarizes the current care guidelines of overweight and obesity in Finland.

**TABLE 3** Treatment goals in childhood obesity in Finland (*Käypä hoito, 2010*).

CLASSIFICATION (degrees of obesity)	TREATMENT GOAL
Normal weight	Maintenance of normal weight
Overweight	Gradual decrease in weight for height towards normal
Obese	Maintenance of (absolute) weight whilst height grows continuous
Severely obese	Weight reduction by up to 1-2 kg/month
Obesity complications	Weight reduction by up to 1-2 kg/month
Age less than 7 years, regardless of the degree of obesity	Weight maintenance whilst height growth towards normal
Age less than 2 years	Usual age-related dietary advice

The TABLE 4 below lists the amount (in %) of overweight and obese children population in some European countries.

**TABLE 4** Overweight (including obesity) in European children (<http://www.who.int>)

Country	Percent (%)	Year Taken
Czech Republic	16.9 % girls	2005
	24.6 % boys	
Denmark	15.2 % girls	1996-1997
	14.1 % boys	
Finland	11.0 % girls	2006
	19.0 % boys	
France	14.9 % girls	2006-2007
	13.1 % boys	
Germany	20.0 % girls	2003-2006
	20.4 % boys	
Greece	37.0 % girls	2005-2006
	45.0 % boys	
Italy	30.9 % girls	2001-2002
	32.4 % boys	
Netherlands	17.9 % girls	2003
	14.7 % boys	
Poland	12.4 % girls	2000
	16.3 % boys	
Spain	22.9 % girls	1998-2000
	32.9 % boys	
Sweden	19.5 % girls	2000-2001
	17.0 % boys	
Switzerland	13.1 % girls	2007
	16.7 % boys	
Turkey	10.3 % girls	2001
	11.3 % boys	
United Kingdom	26.6 % girls	2007
	22.7 % boys	

## 6.2 Obesity Prevention outside Finland

The United States of America, which considered a highly affected nation by the obesity epidemic, has taken strong measures in the prevention of childhood obesity. There are multiple programs that have been tried by the nation to reduce the numbers of obese population. Some of these programs have not been successful as

is made evident by the ever increasing numbers of obese children and adults. However, one latest campaign led by the first lady of America has recommendations to help communities practice healthy lifestyle. This campaign aims at fostering environments that support healthy choices, at giving helpful information to families and individuals and helping children become physically more active. This also ensures that school children receive healthier foods at schools and that every family has access to affordable and healthy food.

The United Kingdom, France, Sweden, Australia, Brazil, Canada, Spain and other European nations as well as some developing Asian nations have taken initiatives in attempts to reduce further development of obesity. Their governments have funded initiative programs for school activities, such as increasing the time allocation for physical education, modification of the school lunch systems, removal of vending machines in schools, nutritional labeling of food products, safer playgrounds and further regulations on food advertising and marketing targeted at children and adolescents. Despite all these initiatives, a continuous rise in childhood obesity numbers is still being noted, particularly with before school-aged children. These facts have made policy makers and concerned healthcare providers to shift its prevention efforts towards the parents.

### **6.3 CORRELATION BETWEEN PARENTAL INFLUENCES AND OBESITY**

Authors such as McGarvey, Keller, Forrester, Williams, Seward and Suttle (2004, 1490); Crawford, Timperio, Telford and Salmon (2006, 889); and de Lauzon-Guillain, Musher-Eizenman, Leporc and Holub (2009, 1064) have reported that parents can be helped to prevent their children from gaining unhealthy weight by providing support for healthy eating and physical activity, or by modeling of activities or eating behaviors. Parents who eat well and are physically active provide a great example for their growing children.

According to McGarvey et al. (2004, 1490), children are influenced by many factors, but there are no stronger influences than that of their parents. Parental influence is

still one of the greatest factors in determining the ways in which a child will grow and develop (Colin, Simmons, Sanigorski, Kremer, & Swinburn, 2008). During the early years of a child's life, parents are usually their children's very first playmates. Parents have a direct role in providing experiences that encourage the child's control of food intake (Blom-Hoffman, Wilcox & Dunn, 2008; Golan & Crow, 2004, 357). It is highly emphasized in many obesity studies that parents play a vital role in influencing their children's health behaviors, from toddler to adolescents.

### **6.3.1 Parents role modeling**

Studies on parents and children conducted in Australia have revealed that children of overweight parents are also overweight. Those parents who eat unhealthy foods tend to have children who eat unhealthily (Suka, Sugimori, Yoshida, Sekine, Yamagami & Kagamimori, 2002, 173). Parents who are physically active tend to have active children as well. These findings indicate that parents have a very strong influence on their children and that parents' influence on food selection, their modeling of healthy eating practices, and their level of physical activity and modeling of sedentary habits are all influential in their children's development of lifelong habits that contribute to normal weight or to obesity.

Especially around preschool age, when children particularly dislike new foods, it is important for parents to model healthy eating habits and to offer a variety of healthy foods to their children (Crawford et al. 2006, 889). Brown, Ogden, Vögele and Gibson (2007, 253) identified in their research that mothers highly influence their daughters' eating habits via their own eating patterns and their food choices. This was also evident in the study conducted in Japan by Suka et al. (2002, 173). These authors identified the association between parental BMI's and their children's obesity. Their findings revealed that increases in parental Body Mass Indexes had high association with obesity at age 9 in girls.

Researchers such as Steffen, Dai, Fulton and Labarthe (2009, 50); Philipsen and Philipsen (2008); Vanhala, Korpelainen, Tapainen, Kaikkonen, Saukkonen and

Keiräinen-Kuikkaniemi (2009, 100) all seem to agree that the home environment is an important setting in relation to molding children's physical activity behaviors and eating habits. De lauzon-Guillan et al. (2009, 1064) and Klein et al. (2010, 125) also highlighted the role of parental feeding practices as one of the most significant factors that continue to influence childhood weight status after birth.

According to Crawford et al. (2005, 890), children are dependent on their parents from the very beginning. Thus, parents are responsible in choosing what type of food the child should eat, how foods are prepared, when and where foods are eaten, which foods are forbidden and in what amount. These authors argue that since children's behavior is often shaped by observation and adaptation, parents must live and promote a healthy lifestyle.

### **6.3.2 Parenting skills and styles**

To promote a healthy lifestyle and to teach children healthy eating habits, parents must possess good parenting skills (Berge, Wall, Neumark-Sztainer, Larson & Story, 2010, 1036). Possessing good parenting skills play a massive part in the interventions for childhood overweight and obesity - as promoting healthy lifestyle, monitoring food intake and restricting unhealthy snacking are something that parents have the ability to control better (Ogden, Reynolds & Smith, 2006). Brown, Ogden, Vögele and Gibson (2007, 253) also contend that the degree of parental control over early feeding has been associated with a child's eating behaviors. Understanding the sources of individual differences in feeding practices is important, given the role of parental feeding practices in establishing children's eating habits (de Lauzon-Guillain et al. 2009, 1067). Parenting styles range from authoritative, authoritarian, permissive and neglectful.

Authoritative parenting and feeding styles, with high warmth and control, was independently associated with better eating behaviors and nutrition, particularly with higher intake of fruits and vegetables among children and adolescents (Berge et al. 2010). Authoritarian parenting on the other hand, with strict discipline and low

warmth, was associated with lower intake of fruits and vegetables. These are consistent with the research studies conducted by Sleddens, Kremers, De Vries and Thijs (2010, 30); Brown et al. (2007, 254) and Ogden et al. (2006, 100) who identified that there was a high association between dietary intake behaviors of children and parental various parental and feeding styles. These authors and many others recommend shifting focus on feeding and parenting style in interventions against childhood obesity by specifically using authoritative parenting as it encourages children to eat healthily. Support for the child as well as parental praise are necessary in long-term maintenance of normal weight status and/or weight loss (van Strien & Bazelier, 2007, 618).

### **6.3.3. Familial Circumstances**

It may be very difficult for parents who are obese themselves to give support and guidance to their children in order to prevent the development of obesity. There have been multiple studies that have identified parental obesity or high BMI as one of the many factors of a child's obesity. A study conducted by Suka et al. (2002, 173); and Stephen et al. (2009) identified that an increased parental body mass index was associated with obesity in children particularly among girls. Reinaerts, de Nooijer, Candel and de Vries (2007, 248) also found that parents' weight was one of the strongest correlate of a child's weight. Some authors have suggested that this may be genetically related but the majority of studies have confirmed that this is highly related to parents' unhealthy eating habits and sedentary lifestyle that has been transmitted to their children.

However, Anderssen, Wold and Torsheim (2005) are opposed to this view because they argue that there is only a slight and weak connection of parental health habits, specifically parental physical activity, that seem to be transmitted to their children. However, Berge et al. (2010, 1036) believe that as the children become older, they can easily be influenced by outside influences, particularly during their adolescent years. During this time of their life, friends and other factors could cause a change in a teenager's behavior and lifestyle. Loprinzi and Trost (2010, 129) also agree that



teenage years are the most critical years of a person's life as outside influences tend to change an adolescent's identity, but they emphasize that despite all other outside influences, parental influence remains one of the greatest factors in determining the ways in which the child will develop and grow.

Due to the enormity of the obesity epidemic, concerns were raised about where efforts should be focused in order to most effectively address this dilemma. As documented in the literature, a variety of intervention methods have been performed globally in attempt to reduce and prevent childhood obesity. For a few decades, schools have been the primary setting for obesity prevention programs in children but some of these efforts have generally been found to have only limited success. Children continue to grow fatter, heavier and unhealthier. It is even more alarming to see is the increasing numbers of overweight and obese children who have not even reached their school age. Thus, the main focus should be turned to the child's more immediate environment - ***the home***.

Several researchers have reported that obesity prevention must be started at a very young age. Since family influences are the key determinants of the high incidence rate of childhood obesity, preventive methods are far more effective when they are more focused on the home environment. The parents, most particularly, can make all the efforts in the prevention and treatment of childhood obesity. Evidence suggests that preventive methods have a higher success rate when parents are involved in the process. Shaping children's eating and physical activity behaviors must start at home because parenting influences different aspects of a child's behavioral development. Negative outcomes were identified in programs that only engaged the child alone (World Health Organization, 2010).

For example, school and community-based obesity prevention programs tend to have short term success when there is limited and/or no support and cooperation from parents. Caballero (2004, 550) contends that it would be more sensible to focus prevention on the younger generation because obesity is a protracted and difficult to treat condition. Prevention must begin as early as possible, when health and nutrition education can shape good dietary practices in order to avoid excess weight

gain throughout people's lives.

## **6.4 STRATEGIES BY PARENTS TO PREVENT OBESITY**

### **6.4.1 Health literacy/ Further education**

Parents' lack of knowledge about obesity and healthy lifestyle could hinder a child's healthy growth. As parents are considered to have a central role in preventing obesity, the appropriateness of their actions and practices regarding the prevention of obesity is of utmost importance. Several studies have reported that parental education on lifestyle change and healthy nutrition is effective in the prevention of childhood obesity. Many experts in the field of health and weight management have provided evidence that long-term success of maintaining a healthy weight in children requires parental knowledge of healthy lifestyle. Families need to be educated regarding the multiple risk factors of unhealthy eating. According to O'Connor et al. (2010, 1065), it is of vital importance that families are educated about healthy lifestyle as this will make them empowered to make healthy choices.

### **6.4.2 BREASTFEEDING INFANTS EXCLUSIVELY FOR 6 MONTHS**

The option of breastfeeding an infant is the mother's choice and decision. Her decision is highly influenced by her knowledge about the health benefits of breastfeeding. Once again, the importance of educating a mother about the great benefits of breastfeeding would be very beneficial. She will gain confidence when she knows the reasons why she needs to breastfeed her baby. She will also learn to nourish herself in order for her child to be nourished by her breast milk. The World Health Organization (2010) recommends breastfeeding infants exclusively for 6 months as many studies reveal that children who were breastfed tend to have low body mass and less susceptibility to illnesses.

### **6.4.3 SERVING MORE FRUITS AND VEGETABLES**

Another example is when parents are educated about the health benefits of eating fruits and vegetables regularly (O'Connor et al. 2010, 1065). By making these foods available at home, children will eventually learn to eat these foods, which thus increases their consumption (Nakada et al. 2009, 86). Families should eat together during mealtimes because the absence of family meals is highly associated with lower fruits and vegetables consumption (Reinaerts, 2007, 248). Regular family meals should be structured, enjoyable and pleasant. Nagging and close monitoring of how much the child eats at mealtime must be avoided. There is sufficient evidence that strict parental monitoring, forceful verbal prompting to empty their plates and attentiveness to non-eating behavior have negative effects on children's eating behaviors. This could result in a child's inability or confusion to distinguish between hungers and feeling full.

During a child's early development, they tend to develop habits that are related to eating. These habits usually start at an early preschool age. Parents can mold their early environments in ways that encourage them to be more healthful by providing fruits and vegetables, and other nutritious food. However, serving healthy foods on the table is not sufficient. According to Wardle, Carnell and Cooke (2005, 227) and Reinaerts et al. (2007, 250), parents must also eat these foods themselves because when a child observes a parent eating and enjoying fruits and vegetables this will positively increase his/her acceptance of these foods.

### **6.4.4 PROMOTING A BALANCE DIET/REDUCE HIGH FAT AND SUGAR**

The food pyramid, used worldwide as the model for healthy eating can be used by parents when preparing meals for the children. Parents should regularly follow the recommended servings from all five groups of the Food Guide Pyramid. Fatty foods such as food high in calories and fat content must be reduced. Unhealthy snacks and other junk foods must be avoided and food must never be used as a reward or punishment (Sleddens et al. 2010, 30). Healthful eating patterns include eating a

variety of foods, creating a positive environment for meals, eating family meals together, having regular meals and snacks and responding to body signals of hunger and fullness.

Following a balanced diet may be a simple task for some but others may find it difficult. For instance, the study conducted by Hesketh et al. (2005, 19) in Australia revealed that even though parents and children were educated about the importance of eating a balance diet, they still tend to consume unhealthy foods on a regular basis. These authors found out that parents were well aware that their family diet was not as healthy as they would like, but the demands and pressure from their children frequently forced them to purchase unhealthy foods. This may be a result from an indirect effect caused by watching television, for example unhealthy food advertisements on television that target children (Hesketh et al. 2005, 19).

#### **6.4.5 REDUCING TELEVISION WATCHING AND COMPUTER USE**

As mentioned above, food advertising could significantly affect children's eating habits as well as parental decision making (Wardle et al.2005, 227). Thus, it is vital to minimize children's television viewing and computer usage not just for the reduction of sedentary lifestyle but also in order to reduce further influences from advertisements that could negatively affect a child's eating habits (International Obesity Task Force, 2010). Proven to have contributed to the development of obesity, television viewing and computer usage must be limited to two hours every day as recommended by several health organizations. Children's television viewing must be restricted in order for them to engage in outdoor activities and playing sports. Steffen, Dai, Fulton and Labarthe (2009, 50) found out that children who watched television excessively tended to have increasing body mass, due to the fact that the children were snacking while watching television. Parents as role models should refrain themselves from watching television for long periods. Evidence from several studies has proven that children who watch more than 2 hours of television per day generally have parents who are avid television viewers (Steffen et al. 2009, 51).

#### **6.4.6 REDUCE SEDENTARY LIFESTYLE THROUGH EXERCISE**

The development of technology, increasing urbanization, unsafe environment due to high crime, poor or non-existent playground facilities have led to a decrease in the frequency and duration of physical activities among young children. Despite all these barriers, parents can provide encouragement and support by being physically active themselves. Trost et al. (2003, 277) concluded in their research that "parental support was an important correlate of youth physical activity, acting directly or indirectly through its influence on self-efficacy". Parents need to ensure that the activities should be performed with the child, that the child will enjoy them and that they are appropriate to his/her age, ability and confidence (SIGN, 2010). As recommended by the Scottish Obesity Prevention Guideline (2010), healthy children with normal weight must take moderate and/or vigorous exercise for 60 minutes every day. Brisk walking, cycling, swimming, running and many other types of exercises can help maintain normal weight. Opportunities for physical activity need to be available at home with family and friends, in after-school activities and within the school day (SNE Weight Realities Division, 2003).

#### **6.4.7 COOPERATION AND COLLABORATION**

The above mentioned strategies are achievable given that the parents have sufficient knowledge and are well-informed about the benefits of a healthy lifestyle. However, some parents may have difficulties in achieving these goals on their own. With the help and guidance of nurses, changes in behaviors to better nutrition and healthy lifestyle are achievable. As nurses play a vital role in the fight against childhood obesity (RNAO, 2009), parents and nurses could work hand in hand in preventing childhood obesity. Nurses can assist parents in understanding the importance of healthy lifestyle, educate them on healthy nutrition and overall support them during the behavior modification.

Some parents may gain information through leaflets or from books, while others may

find face-to-face conversation with a healthcare professional more helpful. Parental cooperation and collaboration with healthcare professionals is vital when working together in preventing childhood obesity. Parents should be educated about the consequences of overweight and obesity to children's health. However, there is one issue that the majority of the participants' parents in many studies had in common, and it was the fact that most of these parents were unaware that their children were overweight and/or obese. As identified by Crawford et al. (2005, 889) and MacFarlane et al (2010), parents are unaware that their children are overweight and/or obese. It is of utmost importance that initial nursing interventions should start from making parents aware that their child is overweight and/or obese.

## **6.5 NURSING INTERVENTIONS**

It is a nurses' responsibility to incorporate health promotional and health education activities into their professional role (Fry & Johnstone, 2006). Sheehan and Yin (2006) contend that health education is a vital aspect of health promotion and that there are many approaches to promoting health. Thus, nurses need to consider aspects of all of these approaches in their day to day practice - be it in the ward or in the community settings. In order to be successful with their approaches, nurses must follow evidenced-based clinical practice guidelines so as to understand the causal factors and health consequences of obesity to children in order to identify obesity prevention efforts.

In many different countries, nurses' level of training and education slightly varies from mental health nurses, pediatric nurses, adult health nurses, community health nurses and maternal infant health nurses to many other specialized nurses. However, they all share the same purpose, and that is to promote health and to prevent illnesses (Johnstone & Fry, 2006). In primary health care settings, nurses are equipped with the clinical knowledge such as what medications to give when the blood sugar level of a diabetic patient goes high or very low, or what to do when a patient becomes cyanosed due to lack of oxygenation from asthma attack, or when a patient suffers from a heart attack and so on. In general, nurses know what actions

to take when confronted with such circumstances but dealing with the underlying issue that causes the development of these modifiable illnesses poses a great challenge. These could be attributed to the sensitivity of the issue, beliefs and traditions, the environment and the nurses' level of motivation. The literature specifies strategies that nurses could adopt to prevent obesity in children.

### **6.5.2 Recognizing obesity-related problems**

To ensure that nurses can provide information associated with healthy eating practices and develop education plans for families, their knowledge and skills must be up to date. As different families have different demands, it is essential for nurses to address their needs. The European Childhood Obesity Group (2010) and National Health & Medical Research Council (2003) suggests that nurses must be well informed and educated regarding the co-existing problem of obesity so that their knowledge will be easily incorporated into effective teaching. The physical, psychological and social aspects must be taken into consideration to ensure effective teaching. A nurse's first priority is to identify children who are at risk of developing obesity. Healthcare professionals should make parents aware that the following risk factors for cardiovascular disease and diabetes are relatively common in obese children and adolescents. Privacy and respect must be observed when identifying children who are at risk. Screening children for body mass index, weight and height must be considered as part of an overall assessment (European Childhood Obesity Group, 2010).

### **6.5.3 Family healthy lifestyle education**

Several authors present parental education as a crucial factor in childhood obesity prevention. They further emphasize that health education is one of the most important nursing interventions because it helps people take greater control over their well-being. Education should include information about healthful eating, physical activity and health risk associated with obesity. Nurses should educate families on different chronic illnesses and types of complication that can occur if

healthy diet and regular exercises are not being met. Through change in diet and physical activity, many risks factors can be easily managed and reduced (O'Connor et al. 2010, 1071). With the help and guidance of nurses, changes in family behaviors from poor to better nutrition and healthy lifestyle are achievable.

#### **6.5.4 Plan Formulation**

When planning for interventions, nurses should identify and understand the family's parenting style (RNOA, 2009), as it will help them in teaching new parenting techniques and to support the family to modify their eating habits. The nurse's plan should include encouragement for the family to track their eating behaviors, help them develops realistic goals and to acknowledge elements in their home environment that lead to unhealthy lifestyle. According to the RNAO nursing guideline (2009), intervention should be carefully planned so that efforts will not have a detrimental impact on body image and the development of disordered eating attitudes. There is a possibility of causing harm when children receive messages that suggest that their personal worth and the way they are seen by others is related to their body size (SNE Weight Realities Guidelines, 2002). Thus, the nurse must set realistic goals that are more focused on health and not on weight.

#### **6.5.5 COLLABORATE WITH THE MULTIDISCIPLINARY TEAM.**

In order to reinforce changes, nurses do not just liaise with clients and families but also collaborating efforts with other healthcare providers involved in the care. This includes doctors, dietitians, counselors, teachers and other community healthcare providers. Nurses should do regular follow-ups and make referrals as necessary. During follow-ups, monitoring of changes in BMI, diet and physical activity patterns should be noted. To care compassionately for these children and families are among the many nursing care duties that a nurse could do. Nurses can also advocate for policy changes in order for the government leaders to make improvements regarding health policies.



### **6.5.6 ADVOCATE**

Nurses can also advocate for health policy change. Advocating for those vulnerable individuals is one of the many duties of a nurse. Especially to those children who are vulnerable and do not have the capacity to speak for themselves. Nurses are in great position to advocate for them and their families in implementing evidence-based strategies for the prevention of childhood obesity. Across healthcare and community-based settings, nurses can campaign for governmental policy changes, such as to advocate for changes at local community, hospitals and school. As children spend many hours of their time at school, this would be an appropriate place where few changes must take place, second to home.

## **7.0 DISCUSSION**

### **7.1 Reliability, validity and ethical considerations**

This thesis was about reviewing the literature to critically analyze and interpret findings of empirical studies that have been published by researchers and scholars in Finland and in other countries. In order for me to identify the reliability, validity and ethical consideration of these researches, a thorough inspection was performed during the information seeking process. As this thesis was not about performing an empirical research, I was fully reliant on previous researches and was only interpreting the findings of someone else's studies or research. In order to find all the relevant materials, such as articles and books, a wide search was performed from reliable internet databases using computerized and manual methods. Only reliable and trustworthy studies were included into the review. These articles were compiled in a step by step manner (see Appendix 1).

A dilemma was encountered during the search process: firstly, many research articles were inaccessible or could not be obtained in full text. Secondly, only very few studies of this topic found in Finland were written in the English language. Thus, the search was then limited to articles published only in the English language. Although

many Finnish researches can be obtained in full text, understanding the language was a problem as I am from a non- Finnish speaking background. Despite these limitations, 33 articles were included in the review which gave a significant amount of identified contributing factors, prevention methods and vital information for obesity prevention.

A strong emphasis on parenting and nursing roles are specified in the thesis. The thesis acknowledges that difficulty arose during the research process because the sample groups or subjects in the majority of the studies did not just consist of nurses but it also included other health care professionals. Deciding whether to focus on the one nursing specialty alone or not came as a dilemma. However, this problem has been rectified. Focusing on a one nursing specialty was then omitted. The gathered guidelines for nursing practice in obesity prevention from different health professional health organizations were sufficient.

The articles gathered had mixed research methodologies and the settings were not limited to only one setting. The systematic review used an objective and transparent approach to minimize bias. Also, this thesis acknowledges the fact that there has been multiple reviews and studies conducted earlier by researchers globally regarding prevention of childhood obesity.

This thesis has further increased my knowledge and awareness of obesity both in children and in adults. As a future nurse, the results have significantly given me ideas that can be utilized when working with patients/clients with excess weight problems. Knowing that obesity is a complicated issue that has interrelated contributing factors, thus, it is my duty as a nurse to collaborate with other members of the multidisciplinary team and advocate to achieve successful outcome in preventing childhood obesity.

## 7.2 Review of the results

Despite the differences in culture, race, socioeconomic background and environment of the research participants, the majority of research on obesity prevention conducted from different countries shared similar findings and conclusions. These studies emphasized the importance of a balance diet by eating healthy nutritious foods and reducing sedentary lifestyle by taking regular exercise and minimizing television viewing as well as computer use. As anticipated, prevention strategies will need to involve not just nurses and healthcare professionals but also from other fields. The home environment is one of the most critical links in providing the foundation for behavioral changes in the prevention of obesity in children (McGarvey et al. 2004, 1494). Some of the articles reviewed yielded unexpected findings and these were parents being unaware that their children are overweight and/or obese.

The information gathered by this review could be helpful when planning further research concerning children's health and obesity prevention. These may also be used to develop more effective nursing interventions and educational programs that address childhood obesity. Even though educating patients/clients is one of the many effective nursing interventions, it has been noted that there seemed to be hesitance on nurses' part in performing this action. According to the literature, nurses are well aware of the health consequences caused by obesity. As noted in the literature, barriers exist due to nurse's lack of specific knowledge regarding the obesity. For instance, nurses may be hesitant to discuss the obesity problem with patients due to the sensitivity of the issue.

Furthermore, nurses may only have a minimal (or none at all) experience in dealing with patients who are at risk of obesity (Swift et al. 2007, 600). Not all nurses have acquired the knowledge and skills needed for obesity prevention. In order to educate patients/clients, nurses must be educated themselves and be sufficiently knowledgeable, particularly in incorporating their knowledge into effective teaching. For instance, motivating families to make healthy choices and collaborating effectively with them to achieve their goals.

A study conducted by Swift, Sheard and Rutherford (2007, 599) of healthcare professionals' knowledge health risk associated with obesity have concluded that nurses recognized their responsibility to counsel and educate their patients/clients, but felt that they needed further training in this area. Similarly, a study conducted by Story et al. (2002, 210) revealed that healthcare professionals felt the need for more training to increase their skills in the management and prevention of childhood obesity. As mentioned in the Nursing Guidelines of RNAO (2009), nurses must be knowledgeable enough to be able to discuss obesity risks and prevention strategies to their patients/clients. An academic and continuing education is highly recommended for nurses for further training in specific skill development, for example teaching and counseling skills. The above mentioned recommendations were discussed by various health organizations guidelines for childhood obesity prevention.

## **8.0 CONCLUSION**

Obesity brings along with it multiple health problems that could persist all the way through to adulthood if an unhealthy and excess weight from childhood was uncontrolled. The health consequences of childhood obesity range from physical, social and psychological. These range from diabetes, asthma, heart diseases, high blood pressure and some form of cancer are only a few of the many medical consequences of obesity. Low self-esteem and depression are the psychological effects while stigmatization, bullying and discrimination are the social problems resulted from being overweight and obese. Identifying children who are at risk of developing obesity and its risk factors is a priority.

The behavioral change, being the cornerstone of preventing obesity in children, has been the main focus of the many preventative strategies by nurses and other healthcare professionals. Increased physical exercise, reduced fatty foods intake, minimized television viewing and computer use and maintained optimal nutrient intake are strategies that are proven to be successful in the reduction and

maintenance of a healthy weight. Full parental involvement is encouraged as parental influences on children's eating behaviors were identified as an important factor in the fight against obesity. Since sedentary lifestyle and poor dietary choices are behaviors that are learned by children from a very young age, parents play a vital role in the behavioral modification process. High emphasis is focused on the home environment – the place where obesity prevention should begin.

In order to combat the obesity dilemma, an active involvement of both parents and healthcare professionals is needed. Nurses, in particular, have a vital role in the prevention of obesity. They can provide health promotion strategies for families to address the challenge of overweight and obesity. They can educate families regarding healthy lifestyle, establish good eating habits, encourage physical activities and practice good parenting style. Thus, to be successful with their approaches, nurses must follow clinical practice guidelines, understand the causal factors and health consequences of obesity, and be sufficiently knowledgeable in order to identify effective obesity prevention efforts.

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Vanhala, M., Korpelainen, R., Tapanainen, P., Kaikkonen, K., Kaikkonen, H., Saukkonen, T. & Keinänen-Kiukaanniemi, S. 2009. Lifestyle risk factors for obesity in 7-year-old children. *Obesity Research & Clinical Practice* 3, 99-107.

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## Appendix 1

Authors/Title	Purpose	Research Type	Participants	Results
Al Sabbah, H., Verreken, C., Kolsteren, P., Abdeen, Z. & Maes, L. 2007: Food habits and physical activity patterns among Palestinian adolescents: findings from the national study of Palestinian schoolchildren. <i>Public Health Nutrition</i> , 10,7, 739-746.	<p>To describe the physical activity/inactivity and food habits.</p> <p>To investigate the relationship of socio-demographic factors.</p>	Cross-sectional survey.	8885 students	The girls had higher intake of fruits, vegetables and sweets and ate less meats. The boys are more physically active than girls but both genders physical activity levels lessened as they become older.
Anderssen, N., Wold, B. & Torsheim, T. 2006: Are parental health habits transmitted to their children? An eight year longitudinal study of physical activity in adolescents and their parents. <i>Journal of Adolescence</i> 29, 513-524.	To Examine associations between parents' self-reported leisure-time physical activity changes and the self-reported physical activity changes of their children.	Cross-sectional study	557 adolescents over an 8 year period from 13 to 21 years of age.	The findings did not support the hypothesis that adolescents' leisure-time physical activity co-varied with their parents' leisure - time physical activity over time.
Berge, J., Wall, M., Neumark-Sztainer, D., Larson, N. & Story, M. 2010: Parenting style and family meals: cross-sectional and 5-year longitudinal associations. <i>Journal of American Dietetic Association</i> 110, 1036-1042.	To test cross-sectional and 5-year longitudinal associations between parenting styles (authoritative, authoritarian, permissive and neglectful) and the frequency of family meals among adolescents.	Cross-sectional and longitudinal study	4,746 youths	The findings revealed that the maternal authoritative parenting style was associated with more frequent family meals even after 5 years later.

Authors/Title	Purpose	Research Type	Participants	Results
Brown, K., Ogden, J., Vögele, C. & Gibson, L. 2007: The role of parental control practices in explaining children's diet and BMI. <i>Appetite</i> 50, 252-259.	To investigate which parents use which types of parenting control practices to manage their children's diets and to assess the impact of these practices on children's dietary patterns and their BMI.	Cross-sectional study	518 parents with children aged 4-7 years in 18 primary schools across the South of England.	Older parents with lower BMI and stay at home parents used more "snack overt control", "snack covert control" and "meal covert control" and those with higher education used more covert control strategies.
Crawford, D., Timperio, A., Telford, A. & Salmon, J. 2005: Parental concerns about childhood obesity and the strategies employed to prevent unhealthy weight gain in children. <i>Public Health Nutrition</i> 9 (7), 889-895.	To describe parental concerns about their child's weight, to determine the proportion of parents taking preventive action to avoid obesity and the predictors of taking preventive action, and to describe the strategies adopted by parents.	Cross-sectional study.	291 families of children aged 5-6 years old and 919 families of children aged 10-12 years old.	Parents of 5-6 years old, 89% were unaware of child's overweight, 71% were unconcerned, and 31% took preventive actions. While parents of 10-12 yrs. old, 63% of parents were unaware, 43% unconcerned and 43% took preventive actions.
De Lauzon-Guillain, B., Musher-Eizenman, D. Leporc, E. Holub, M. & Charles, M. 2009: Parental feeding practices in the United States and in France: Relationships with child's characteristics and parent's eating behaviour. <i>Journal of the American Dietetic Association</i> 109, 1064-1069.	To examine the role of several psychological variables in individual differences in a variety of feeding practices.	Cross-sectional study	97 parents in United States  122 parents in France	In France, monitoring was associated with parental perceived responsibility for child's eating, parental restrained eating, and parents' desire for their child to be thinner. The U.S.'s parental use of foods for non-nutritive purposes was more prevalent.
Gance-Cleveland, B., Sidora-Arcoleo, K., Gottersman, M. & Brady, M. 2009: Changes in nurse practitioners' knowledge and behaviors following brief training on the Healthy Eating and Activity Together (HEAT) Guidelines. <i>Journal of Pediatric Health Care</i> 23 (4), 222-230.	To improve provider behavior and efficacy.	Data were collected pre training and post-training.	35 nurse practitioners	The findings revealed that significant improvements in practitioner's knowledge, intent to improve behavior and increased confidence in ability to address obesity barriers.

Authors/Title	Purpose	Research Type	Participants	Results
Golan, M. & Crow, S. 2004: targeting parents exclusively in the treatment of childhood obesity: Long-term results. Obesity Research 12 (2), 357-361.	To report the long term change in children's overweight following a family-based health-centered approach where only parents were targeted compared with a control intervention where only children were targeted.	Longitudinal study	60 children	The findings revealed that the mean reduction in percent overweight was greater at all follow-up points in children of the parent-only group compared with those in the children-only group.  After seven years, the mean reduction in children's overweight was 29% in the parent-only group vs. 20.2% in the children-only group.
Gray, V., Byrd, S., Cossman, J., Chromiak, J. Cheek, W. & Jackson, G.2007: Parental attitudes toward child nutrition and weight have a limited relationship with child's weight status. Nutrition Research 27, 548-558.	To investigate parental attitudes related to childhood overweight and differences between families with children at risk for overweight or obesity and families with children not at risk for overweight.	Surveys were administered to parents of second graders. Anthropometric measurements were collected on second graders.	169 parents	41.4% of children were classified as at risk for overweight but only 12.4% of parents considered their child to be overweight.
Hesketh, K., Waters, E., Green, J. Salmon, L. & Williams, J. 2005: Healthy eating, activity and obesity prevention: a qualitative study of parent and child perception in Australia. Health Promotion International 20 (1) 19-22.	To elicit child and parent views regarding social and environmental barriers to healthy eating, physical activity and child obesity prevention programmes, acceptable foci, and appropriate modes of delivery.	Qualitative study	119 children's 17 parents	Themes were identified: awareness, contradiction between knowledge and behavior, lifestyle balance, local environment, barriers to a healthy lifestyle, contradictory messages, myths, roles of the school and family, and content of prevention strategies for childhood obesity.

Authors/Title	Purpose	Research Type	Participants	Results
Huus, K., Brekke, H., Ludvigsson, J. & Ludvigsson, J. 2009: Relationship of food frequencies as reported by parents to overweight and obesity at 5 years. <i>Acta Paediatrica</i> 98, 139-143.	To investigate if food frequencies are related to overweight/obesity in 5-year-old children.	Prospective cohort study.	21,700 infants were invited to participate during 1997-1999. Participants were followed from birth to 5 years.	The findings revealed that at 2.5 years, frequencies of cheese intake were positively associated with overweight/obesity at 5 years. While porridge, fried potatoes/french fries and cream fraiche showed a negative association.  At 5 years, chocolate and lemonade were positively associated with overweight and obesity whereas cream fraiche, pastries and candy were negatively associated.
King, C., Meadows, B. Engelke, M. & Swanson, M. 2006: Prevalence of elevated body mass index and blood pressure in a rural school-aged population: Implications for school nurses. <i>Journal of School Health</i> 74 (4) 145-149.	To examine the relationships between age, ethnicity, race, body mass index and elevated blood pressure in a rural school-aged population.	Qualitative study	1173 students	The findings revealed that a direct relationship between elevated BMI and elevated blood pressure for all groups were more prevalent in older students. Whereas African Americans were more likely to have elevated blood pressure with a normal BMI.
Klein, D., De Toia, D., Weber, S., Wessely, N., Koch, B., Dordel, S., Sreeram, N., Tokarski, W., Struder, H. & Graf, C. 2010: Effects of a low threshold health promotion intervention on the BMI in pre-school children under consideration of parental participation. <i>e-SPEN, the European e-Journal of Clinical Nutrition and Metabolism</i> 5, e125-e131.	Testing the effect of a low threshold intervention on anthropometry and motor abilities of preschool children.	Qualitative study.	1050 children from 27 kindergartens.	The findings revealed that the average BMI increased in the control group and decreased in the intervention group.

Authors/Title	Purpose	Research Type	Participants	Results
Kontrogianni, M., Farmaki, A., Vidra, N., Sofrona, S., magkanari, F. & yannakouha, M. 2010. Associations between lifetsyle patterns and Body Mass Index in a sample of Greek children and adolescents. <i>Journal of American Dietetic Association</i> 110, 215-221.	Assessed lifestyle patterns in relation to body mass index.	Cross-sectional study.	1,305 children & adolescents from ages 3 to 18 years.	The finds identified seven lifestyle patterns characterized by higher eating frequency, breakfast consumption and higher KIDMED score. These were negatively associated with BMI.
Larsen, L., Mandleco, B., Williams, M. & Tiedeman, M. 2006: Childhood obesity: Prevention practices of nurse practitioners. <i>Journal of the American Academy of Nurse Practitioners</i> 18, 70-79.	To describe the prevention practices of nurse practitioners regarding childhood obesity.	Data collection survey.	99 family nurse practitioners and pediatric nurse practitioners.	The findings revealed that nurse practitioners working in family practice or general pediatric practice settings were not consistently using the BMI-for-age index to screen for childhood obesity. They were mainly teaching parents to promote healthy food choices and physical activity in their families.
Loprinzi, P. & Trost S. 2010: parental influences on physical activity behavior in preschool children. <i>Journal of Preventive Medicine</i> 50, 129-133.	To evaluate a conceptual model linking parent physical activity orientations, parental support for physical activity and physical activity behavior in preschool children.	Data collection via questionnaires for parents.	156 parent-child dyads from 13 child care centers.	The findings revealed that parental physical activity and parents' perceptions of competence were positively associated with parental support for physical activity.
Marshall, D., McConkey, R. & Moore, G. 2003. Obesity in people with intellectual disabilities: the impact of nurse-led health screenings and health promotion activities. <i>Journal of Advanced Nursing</i> 41, 2, 147-153.	Determined effectiveness of health promotion actions taken after follow-up of people identified as overweight.	Qualitative study.	464 intellectually disabled children aged 10 years and over.	The findings revealed that nurses' health promotion classes have led significantly in the reduction of weight and body mass index among overweight and obese participants.

Authors/Title	Purpose	Research Type	Participants	Results
<p>McGarvey, E., Keller, A., Forrester, M., Williams, E., Seward, D., Suttle, D. 2004: Feasibility and benefits of a parent-focused preschool child obesity intervention. American Journal of Public Health, 94, 9, 1490- 1495.</p>	<p>To test the feasibility and benefits of a program to promote 6 targeted parental behaviors to prevent obesity in children.</p>	<p>Prospective study</p>	<p>2 WIC (Women, Infants and Children) sites</p>	<p>The findings revealed that the pre-intervention and post-intervention assessments of parental behavior demonstrated significant changes in 2 behaviors. These were frequency to offer the child water and engaging in active play with the child. Both interventions proved effective in increasing the desired behavior.</p>
<p>Nakade, M., Su Lee, J., Kawakubo, K. Kondo, K. Mori, K &amp; Akabayashi, A. 2008: Changes in food intake patterns associated with body weight loss during a 12-week health promotion program and a 9-month follow-up period in a Japanese population. Obesity Research &amp; Clinical Practice 3, 85-98.</p>	<p>To examine the short-and long-term relationships between changes in food intake patterns and body weight loss.</p>	<p>Qualitative study</p>	<p>506 overweight/ obese men and women.</p>	<p>The findings showed that participants body weight loss changed pattern from “sweets, meats, dairy products and alcohol” to “plant foods and seafood” was significantly larger than that of the participants who showed an opposite pattern change.</p>
<p>O’Connor, T., Watson, K., Hughes, S., Beltran. A., Hingle, M., Baranowski, J., Campbell, K., Canal, D., Lizaur, A. Zacarias, I., Gonzales, D., Nicklas, T. &amp; Baranowski, T. 2010: Health professionals' and dietetics practitioners' perceived effectiveness of fruit and vegetable parenting practices across six countries. Journal of the American Dietetic Association 110, 1065-1071.</p>	<p>To assess health professionals and dietetics practitioner’s opinions about the effectiveness of parenting practices that promotes increase of fruits and vegetables intake in children.</p>	<p>Cross-sectional study</p>	<p>889 participants</p>	<p>The findings revealed that responsive and structured parenting practices together with nondirective control seemed to be more effective in getting pre-school children to eat fruits and vegetables.</p>



Authors/Title	Purpose	Research Type	Participants	Results
Ogden, J., Reynolds, R. & Smith, A. 2006: Expanding the concept of parental control: A role for overt and covert control in children's snacking behavior. <i>Appetite</i> 47, 100-106	To explore an expanded conceptualization of parental control with overt and covert control.	Cross-sectional study	1,297 parents of children aged between 4 and 11 years old	The findings revealed that the higher the social class, parents are likely to use overt control whereas those parents with heavier children tend to use covert control.
Reinarts, E., de Nooijer, J., Candel, M. & de Vries N. 2007: Explaining school children's fruit and vegetable consumption: The contributions of availability, accessibility, exposure, parental consumption and habit in addition to psychosocial factors. <i>Appetite</i> 48, 248-258.	Studied parental contribution of fruit and vegetable consumption, availability and accessibility in the home.	Questionnaires	1739 parents of 4-12 years old children	The findings revealed that "habit" was the most influential correlate of fruits and vegetables consumption.
Sleddens, E., Kremers, S., de Vries, N. & Thijs, C. 2010: Relationship between parental feeding styles and eating behaviours of Dutch children aged 6-7. <i>Appetite</i> 54, 30-36.	Assessed the relationship between parental feeding styles and dietary intake behaviors of Dutch children aged 6 to 7 years old.	Cross-sectional survey	135 parents	The findings showed that various feeding styles of parents were related to parental dietary behaviors.
Steffen, L., Dai, S., Fulton, J., & Labarthe, D. 2009: Overweight in children and parental adolescents associated with TV viewing and parental weight. <i>American Journal of Preventive Medicine</i> 37, 50-55.	Assessed and examined the association of children's TV viewing and computer use with body mass and parental weight status.	Cross-sectional	526 children	The findings revealed that children with overweight parent(s) watched more television in comparison to children whose parents are in normal weight range.

Authors/Title	Purpose	Research Type	Participants	Results
Story, M., Neumark-Stzainer, D., Sherwood, N., Holt, K., Sofka, D., Trowbridge, F. & Barlow, S. 2002: Management of child and adolescent obesity: Attitudes, barriers, skills, and training needs among health care professionals. <i>Pediatrics</i> 110, 1, 210-214.	Evaluated health care professionals perceived skill level, attitude, barriers and training needs in the management of childhood and adolescent obesity.	Questionnaire – a national needs assessment.	202 pediatricians 293 pediatric nurse practitioners 444 registered nurses	The findings showed that the respondents believed that lack of parental involvement, patient's motivation and lack of support services are barriers to treating obesity.
Suka, M., Sugimori, H., Yoshida, K., Sekine, M., Yamagami, T. & Kagamimori, S. 2002. Parental Influence on the Development of Obesity in 9-year-old Japanese Children: the Toyama Birth Cohort Study. <i>Environmental Health and Preventive Medicine</i> 7, 173-175.	Examined parental influence on the development of obesity in 9-year old Japanese girls.	Longitudinal study.	6,102 children	The findings revealed that the increase parental obesity and body mass index, were associated with obesity at age 9 among girls.
Swift, J., Sheard, C. & Rutherford, M. 2007. Trainee health care professionals' knowledge of the health risks associated with obesity. <i>Journal of Human Nutrition and Dietetics</i> 20, 599-604.	Investigated nursing students as well as medical and dietetic students' knowledge about obesity and their role as a whole.	Online survey method.	38 dietetic 88 nursing students (diploma) 74 nursing students (masters) 389 medical students	Only the dietetic students were satisfied with the teaching received regarding obesity management. The majority of students agreed that part of their professional roles was to counsel obese patients.
Trost, S., Sallis, J., Pate, R., Freedson, P., Taylor, W. & Dowda, M. 2003. Evaluating a Model of Parental Influence on Youth Physical Activity. <i>American Journal of Preventive Medicine</i> 25, 4, 277-282.	Tested the conceptual model linking parental physical activity orientations, support for physical activity and children's self-efficacy perceptions.	Questionnaires	380 students	The parental physical activity support correlates with youth physical activity.

Authors/Title	Purpose	Research Type	Participants	Results
Vanhala, M., Korpelainen, R., Tapanainen, P., Kaikkonen, K., Kaikkonen, H., Saukkonen, T. & Keinänen-Kiukaanniemi, S. 2009. Lifestyle risk factors for obesity in 7-year-old children. <i>Obesity Research &amp; Clinical Practice</i> 3, 99-107.	Evaluated the association of overweight and obesity in 7-year old children.	Cross-sectional study	855 children	The results have showed that many parents did not recognize their child's weight problem. Also, skipping breakfast was associated with obesity among children. It is also proven that mother's obesity and low physical activity is link to child's obesity.
Vignolo, M., Rossi, F., Bardazza, G., Pistorio, A., Spigno, S., Torrisi, C., Gremmo, M., Veneselli, E. & Aicardi, G. 2008. Five-year follow-up of a cognitive-behavioral lifestyle multidisciplinary programme for childhood obesity outpatient treatment. <i>European Journal of Clinical Nutrition</i> 62, 1047-1057.	Examined the five-year follow-up results of a cognitive-behavioral programme intended to obtain a weight growth regulation over an extended period.	Longitudinal observation clinical study	31 obese children from 6 to 12 years of age.	Combined lifestyle centered approach, parental involvement, nutrition education and cognitive behavioral strategies have positive results in reduction of weight among obese children.
Wardle, J., Carnell, S. & Cooke, L. 2005. Parental Control over Feeding and Children's Fruit and vegetable Intake: How Are They Related? <i>Journal of the American Dietetic Association</i> 105, 227-232.	To replicate the finding of a negative association between parental control and fruit and vegetable consumption in girls.	Cross-sectional questionnaire survey.	564 parents	The results revealed that parental control was correlated with children's fruits and vegetables consumption and had found no significant gender differences.
Werner, B. & Bodin, L. 2007. Obesity in Swedish Schoolchildren is increasing in Both Prevalence and Severity. <i>Journal of Adolescent Health</i> 41, 536-543.	To monitor and describe the development of body mass index, overweight and obesity of school children in Sweden.	Longitudinal and cross-sectional studies	3,749 individuals	The findings revealed that the obesity problem is growing severely for both boys and girls. Also, a strong positive secular change in BMI was found at all ages.
Yu, J. & Gamble, W. 2008. Pathways of Influence: Marital Relationships and their Association with Parenting Styles and Siblings relationship Quality. <i>Child &amp; Family Studies</i> , 17,757-778.	To investigate the associations among quality mothers' parenting styles, marital relationship and young children's sibling relationship quality.	Qualitative study	130 mothers	The findings revealed that there is a significant relation between sibling relationship and parenting styles.

