CHAPTER – II

REVIEW OF LITERATURE

A review of literature is an essential scientific research. It is a systematic identification, scrutinisation and summarization of the written materials that contains information relevant to the problem.

This chapter consists of two sections,

2.1 Section A – Related Literature

2.2 Section B – Conceptual framework

SECTION A

The related literature is arranged under the following headings.

2.1.1 Prevalence of childhood obesity
   a. Global scenario
   b. Indian scenario

2.1.2 Overview of childhood obesity

2.1.3 Role of parents in childhood obesity

2.1.1 Prevalence of Childhood Obesity

Obesity has reached epidemic proportions globally, with overweight – at least 300 millions of them clinically obese which is a major contributor to the global burden of chronic disease and disability, affecting virtually all ages and socioeconomic groups. In the United States, the number of overweight children and adolescents had doubled in the
last two to three decades, and similar doubling rates are being observed worldwide, including in developing countries and regions where an increase in Westernization of behavioural and dietary lifestyle is evident.

(a) Global Scenario

Obesity is one of the most prevalent nutritional disease of children and adolescents in many developed and developing countries. The World Health Organisation (WHO) has declared overweight as one of the top ten health risks in the world and one of the top five in developed nations. Existing WHO standards and data from 79 developing countries including a number of industrialized countries suggest that about 22 million children of five years old are overweight worldwide. Once considered a problem of affluence, obesity is fast growing in many developing countries also.

The Centers for Disease Control and Prevention (CDC) estimates that childhood obesity has tripled since 1970 (National Heart, Lung & Blood Institute, 2006). Prevalence had increased across lines of gender, ethnicity, socioeconomic factors and region (Crawford, Story, Wang, Ritchie, & Sabry, 2001; Wang & Zhang, 2006). Internationally, childhood obesity has increased in countries as varied as Brazil, Germany, China and Australia (Wang, Monteiro & Popkin, 2002).

The Prevalence rates of obesity (BMI exceeding the 95th percentile) among U.S. children and adolescents aged 6-11 and 12-19 years, respectively were 4.2 and 4.6% in 1963-1970, 4.0 and 6.1% in 1971-1974, 6.5 and 5.0% in 1976-1980, 11.3 and 10.5% in 1988-1994, and 15.3 and 15.5% in 1999-2000, an alarming rate of increase. Obesity increased between 1988 and 1999 from 7 to 10% among those aged 2-5 years (CDC
In a cross-sectional survey of children 9-12 years old in Hong Kong, 38% of girls, but 57% of boys were overweight, with overweight children of both sexes showing higher systolic blood pressure, triglyceride, insulin and lower level of HDL cholesterol than the normal-weight group (Sung et al, 2003). In Australia, 5% of children are currently obese. The prevalence rates of obesity 24% (BMI exceeding the 95th percentile) among U.S. children and 16% overweight (BMI 85th to 95th percentile). These prevalence are doubled over the past decade after being nearly stable around 10% from 1969 to 1985 (Booth et al, 2003).

Martorell et al (2000) reported results of 71 national nutrition surveys since 1986 from 50 countries on 150,482, 12-60 month old children. They showed that prevalence of overweight and obesity in 32 out of 50 countries was less than 2.3% (Martorell et al 2000). Therefore, they concluded that obesity was not a major public health problem among pre-school children in Asia and Sub-Saharan Africa. But in a number of countries in Latin America and the Caribbean, the Middle East and North Africa, and the region of Central Eastern Europe / Commonwealth of Independent States, obesity prevalence was as high as in the USA (Martorell et al 2000). The study by de Onis & Blossner (2000) also confirmed that the Middle East, North Africa and Latin America had the highest rate of childhood obesity among developing countries (de Onis & Blossner 2000).

Based on the WHO consultation on obesity report (WHO 1998), obesity prevalence in children has been made for various countries. No indication was given of age, race, sex, or any details of the sample. These estimates were as follows: Bangladesh 0.3%, India 1.2%, Jordan 2.2%, UK 2.8%, Italy 3.6%, Peru 4.0%, Iran 5.7%, Canada 5.8% and Chile 11.8%. Despite limitations in the methodology used by WHO, these
values indicate that the prevalence of obesity in children of developing countries is probably high and in some cases even higher than developed countries, particularly when taken together with the studies of Martorell et al (2000) and de Onis & Blossner (2000).

A study by Wang and colleagues used an international standard of measurement to illustrate weight patterns of children aged 6-18 years old in four countries; United States, Brazil, China and Russia. The measurement standard used was developed by the International Obesity Task Force (IOTF), which utilized BMI cut off points from data compiled of children from many countries. It also incorporated BMI measures derived from gender specific curves that pass through adult BMI curves at age 18 years of age. The four countries in Wang’s study represented one fourth of the world’s population. Analysis of the data demonstrated the trend of overweight and obese children is increasing in both industrialized and developing countries. While adolescents from the United States show markedly higher numbers of overweight prevalence, Brazil trends were similarly reflected. Russia did not show trends towards overweight but inversely demonstrated more underweight children. (Wang et al.,2002).

A scientific statement published by the American Heart Association identified data from two separate studies demonstrating how the prevalence of overweight children in Australia doubled from 1985 to 1995 (Daniels et al., 2005). Increases in childhood obesity have also been noted in Canada, United Kingdom, Germany, France and Finland (Lobstein, Baur, & Uauy, 2004), with rates of overweight children increasing across Europe by more than 400,000 cases per year. Among overweight children in Europe,
three million are estimated as obese with eighty-five thousand new diagnoses yearly (Lobstein et al, 2004).

(b) **Indian Scenario**

In children, the difference between the rich and the poor is fairly evident in recently conducted urban studies. Ramachandran et al., (2002) studied children from six schools, two each from high, middle and lower income groups in Chennai. The prevalence of overweight (including obese) adolescents ranged from 22% in better off schools to 4.5% in lower income group schools. In a Delhi school with tuition fees more than Rs.2,500 per month, the prevalence of overweight was 31%, of which 7.5% were frankly obese (Kapil et al, 2002). In a similar study in Pune showed prevalence of overweight children in well off school was 24% and 6%.

In a recent report by National Health Examination Surveys (2002), about 25% of Indian population falls under the category of obese. Overweight prevalence is higher in boys (32.7%) than girls (27.8%). In adolescents, overweight prevalence is same for females (30.2%) and males (30.5%). So we can say that along with other developed countries India is fattening too and if we allow this trend to continue, it will top the world in diabetes and coronary heart diseases earlier than estimated.

One in every three students in private schools in Delhi aged between 14 to 18 years is overweight. Obesity among children in the capital has shot up from 16 percent in 2002 to 24 percent in 2007, says Dr Anoop Misra, Director, Department of diabetes and metabolic diseases, Fortis Hospital, Delhi. Nearly half of the country’s 250 million adolescents are chubby, similar to children in USA. Smaller towns too, fare no better.
The national representation data on childhood obesity in developing countries are scarce with very few reports on the prevalence of obesity among children. The prevalence of overweight/obesity in urban children in Delhi has shown an increase from 16% in 2002 to about 24% in 2006. According to recent data, the prevalence among adolescents’ children (14-17 years) was 29% in private schools and 11.3% in government funded schools in 2006-2007.

### Childhood obesity in India

<table>
<thead>
<tr>
<th>Author (y)</th>
<th>Age group(y)</th>
<th>N</th>
<th>Location in India</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharma et al (2007)</td>
<td>4-17</td>
<td>4000</td>
<td>Delhi (North)</td>
<td>Overweight, 22; obesity 6</td>
</tr>
<tr>
<td>Mohan et al (2004)</td>
<td>11-17</td>
<td>3326</td>
<td>Punjab (North)</td>
<td>Urban, Overweight 11.6, obesity 2.4; Rural, Overweight 4.7, obesity 3.6</td>
</tr>
<tr>
<td>Ramachandran et al (2002)</td>
<td>13-18</td>
<td>4700</td>
<td>Chennai (South)</td>
<td>Overweight, boys 17.8, girls 15.8</td>
</tr>
<tr>
<td>Kapil et al (2002)</td>
<td>10-16</td>
<td>870</td>
<td>Delhi (North)</td>
<td>Obesity 7.4, boys 8, girls 6</td>
</tr>
<tr>
<td>Gupta et al (1990)</td>
<td>5-15</td>
<td>3861</td>
<td>Uttar Pradesh (North)</td>
<td>Obesity 7.6</td>
</tr>
</tbody>
</table>

National representation data for childhood obesity in India is unavailable; however, available studies of Chennai and Delhi showed that prevalence of 6.2% and 7.4% respectively (Vedavathi, 1998 & Kapil U et al 2001).
2.1.2 OVERVIEW OF CHILDHOOD OBESITY

It is a well known fact that the United States holds the number one position for highest prevalence rates of obesity around the globe (Nation master 2004). As compared with other nations worldwide, a staggering 30.6 percent or about one third of the U.S. population is considered to have a body weight regarded as obese. Even more shocking is the fact that a large number of people belonging to this group are young children and adolescents. Results from the 2007-2008 National Health and Nutrition Examination Survey indicate that an estimated 17 percent of children and adolescents of ages 2-19 years are obese. Such a large portion of young children having unhealthy weight are extremely worrisome due to the fact that obese children and adolescents are more likely to become obese adults (AACAP 2008).

Obesity is associated with a number of serious health concerns including but not limited to high blood pressure, cardiovascular disease, diabetes, and decreased life expectancy (AACAP 2008). Childhood obesity has become so commonplace in the U.S. and poses such serious health risks to children that this devastating trend has received widespread attention in the news and media in order to create more awareness surrounding causes and consequences of this epidemic. Environmental factors such as increased consumption of high fat “fast food” and decreased physical activity have already been identified as central components to the growing number of children becoming obese in early age.

However, what internal factors are influencing children’s weight? Are the eating habits and nutrition guidelines which the children learn from their parents affecting their
weight? While many factors contributing to childhood obesity have been explored and identified in past studies, few research teams have analyzed the relationship between childhood obesity and the role parent figures have in promoting or hindering the development of this unhealthy trend in children’s weight.

Centers for Disease Control and Prevention (2010) define overweight and obesity as labels for ranges of weight that are greater than what is generally considered healthy for a given height; in addition, the terms also identify the specific weight ranges that have been shown to be strongly correlated with increased likelihood of certain diseases and other serious health problems. Calculating body mass index or BMI is the most common method of initially assessing whether or not an individual is considered overweight or obese. Body mass index is determined by measuring an individual’s weight in relation to their height. In particular for children and adolescents of ages 2-19 years, age and sex are factored into determining weight status due to the fact that body development varies dramatically between boys and girls during these years.

Obesity is defined as a BMI at or above the 95th percentile for children of the same age and sex (CDC 2010). The American Academy of Child and Adolescent Psychology (2008) describes childhood obesity as a child weighing at least ten percent higher than what is recommended for their height and body type. It is critical to access body fatness in overweight children who are at risk of becoming obese as early on as possible in order to lower the likelihood that the children will develop into overweight or obese adults.
One study found that approximately eighty percent of children who were overweight at age 10–15 years became obese adults at age 25 years (CDC 2010). Hindering children from becoming overweight and obese adults can literally save lives; it is reported by the National Institute of Diabetes and Digestive and Kidney Diseases (2004) that approximately 300,000 adult deaths in the United States each year are attributed to unhealthy dietary habits and physical inactivity or sedentary behaviour.

In a population based sample of 5 to 17 year old American children, 70% of obese children had at least one cardiovascular disease risk factor while 39% of obese children had two or more cardiovascular disease risk factors (CDC 2010). There is also growing evidence connecting unhealthy weight with increased risk of developing cancer. Recent studies conducted by the American Institute for Cancer Research (2008) indicate that more than 100,000 cancers in the US each year are linked to excess body fat. An additional study by the American Cancer Society reported that of 900,000 men and women observed, the heaviest men had death rates from all cancers combined that were 52% higher than the rates among normal weight men. The heaviest women participating in the study had death rates from cancer that were 62% higher than normal weight women.

Worldwide, disease profiles are transforming at a rapid pace catching the attention of medical professionals and policy makers alike. This is particularly true in low and middle-income countries that form the major chunk of global population. The emerging epidemics of obesity, cardiovascular disease (CVD) and diabetes form the crux of this phenomenal change. Among these entities, obesity has become a colossal epidemic
causing serious public health concern and contributes to 2.6 million deaths worldwide every year. Obesity is an independent risk factor for CVD. Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. The last two decades of the previous century have witnessed dramatic increase in health care costs due to obesity and related issues among children and adolescents.

In addition to posing serious dangers to physical well being, obesity also increases the likelihood of emotional problems such as depression, anxiety, and lowered self-esteem. Braet (2009) obtained research findings that indicated clinical groups of obese children reported more feelings of negative physical self perceptions than their non obese peers and scored lower on general self worth. Parents of the clinically obese children involved with the study also reported more behavioral and emotional problems than the parents of the non obese counterparts. Geier (2007) suggests there is also a link between relative weight and school attendance among elementary school children. His findings showed that overweight children were absent from school significantly more than normal weight children; the data suggests that in addition to the medical and psychosocial consequences of being overweight, heavier children have greater risk for school absenteeism than their normal-weight peers (Geier 2007).

The rise in obesity among children can be attributed to our changing society. Over the past few decades, students have been exposed to changes both in the school and at home. To begin with, in today’s gender-integrated workforce, families are eating a greater percentage of meals from restaurants and fast food takeout. The nutritional and caloric implications of this are obvious. Additionally, in an effort to improve America’s
academic standing (student performance on standardized tests) throughout the world, many school districts have sacrificed recess, extracurricular sports, and physical education to provide more time for core subjects. The lack of exercise continues after the school day ends: children and teenagers are spending more time watching television and playing computer games than the previous generation did. In 1997, the International Life Sciences Institute estimated that less than 25 percent of children in this country were getting at least 30 minutes of any kind of daily physical activity. A decrease in physical activity is not the only significant change though the quality of nutrition among students has significantly decreased as well. Many schools today, in an effort to raise more money, now have candy and soda vending machines, a problem compounded by the fact that students no longer go home for lunch. According to a 1996 study, conducted by the U.S. Department of Agriculture, only 2 percent of students were consuming the recommended daily servings from each of the major food groups.

Dramatic and rapid societal changes during the last decades have contributed significantly to childhood obesity. There is evidence stating that individual’s eating and physical activity behaviours are heavily influenced by surrounding social and physical environmental contexts both for adults and children. Urbanization related intake behaviours that have been shown to promote obesity include frequent consumption of meals at fast-food outlet, consumption of oversized portions at home and at restaurants, consumption of high calorie foods, such as high-fat, low-fiber foods and intake of sweetened beverages. These behaviours are cultivated in an environment in which high calorie food is abundant, affordable, available, and easy to consume with minimal preparation as is the case of urban cities throughout the country.
In most general terms, obesity occurs when an individual consumes more calories than the body is able to burn up, which results in an accumulation of excess proportions of body fat. There are many different causes contributing to the development of obesity during childhood that include genetic, biological, behavior, and cultural environmental factors (AACAP 2008). The American Academy of Child and Adolescent Psychiatry (2008) cites that obesity in childhood and adolescence can be related to poor eating habits, overeating or bingeing, lack of exercise, family history of obesity, medical illnesses and medications, stressful life events or changes, family and peer problems, low self-esteem, and depression or other emotional problems.

One study cited by the CDC (2010) discovered that less than one-third (28%) of high school students meet currently recommended levels of physical activity. Reasons for this drop in physical activity among children and teens appear linked to sedentary behaviors, including the increased amounts of time children spend engaged with media sources such as television, video games, and computers. Another research study found that time spent watching TV, videos, DVDs, and movies averaged slightly over 3 hours per day among children aged 8–18 years (CDC 2010).

Several studies have found a positive association between time spent viewing television and increased prevalence of obesity in children (CDC 2010). This connection appears rooted in the fact that watching television not only takes away from time children could be spending being physically active, but also places children in the home where snacks and food advertisements are more readily available.
Childhood obesity increases the risk of obesity in adulthood and parental obesity interacts quite strongly to alter this risk, and there are several interactive factors contributing to the increased prevalence of obesity in childhood. Societies like India, which are rapidly urbanising, demonstrate increases in energy intake, dramatic increases in fat intake along with increased levels of sedentarianism. Lifestyle changes resulting in physical inactivity and sedentary behaviour are important in contributing to obesity in children. This is exemplified by more time in a day spent by children in physically passive behaviours such as TV viewing, working or playing games on a computer, talking on the telephone etc.

Television viewing and other sedentary activities have also been related to childhood obesity. Unfortunately this habit is growing exponentially in developing countries as well. Low levels of physical activity is definitely promoted by an automated and automobile-oriented environment that is conducive to a sedentary lifestyle. Community design and infrastructure characteristics are also becoming increasingly important in determining levels of obesity in populations. Such factors include availability of safe walkways, bicycle paths, playgrounds and other avenues for physical activity related recreation.

Galson (2008) identifies poor attention to nutrition, increased access to fast food, high fat content processed snacks, and high calorie sugary beverages as major contributors to the growing childhood obesity crisis. Quick easy access to cheap food that is high in fat and sugar content combined with infrequent exercise and physical activity seem to be two of the most widely accepted causes of the unhealthy weight trend
plaguing children of the past few decades. Hoerr (2009) argues that fast food and eating away from home is not necessarily problematic for every child, but rather that children who have a stronger predisposition to developing obesity due to biological or genetic factors need to be extremely careful in monitoring their consumption of these high fats and refined sugars.

Data from a number of studies provide strong evidence that higher levels of body mass index (BMI) during childhood can predict overweight later in life. This was recently summarized in a review by Goran, M. I. (2001) and Goran concluded that the "persistence of pediatric obesity into adulthood increases according to the age at which obesity is initially present." Similar to what has been recorded in North America, obesity during childhood in Japan is associated with increased likelihood of obesity during adulthood. In a Japanese study, approximately one-third of obese children grew into obese adults (Kotani, K., Nishida, M., Yamashita, S., et al., 1997). Whitaker et al. (1997) found that the risk of adult obesity was greater in both obese and non-obese children if at least one parent was overweight. This effect was most pronounced in children that were <10 years old; over the age of 10 years, the child's own overweight/obesity status was a better predictor than having an obese parent. These studies show the importance of the family environment in contributing to the increasing prevalence of obesity. Most likely these increases are associated with changes (increases) in food supply and caloric intake accompanied by diminishing levels of physical activity.

Must et al., (2000) presented data relating to the outcomes of overweight adolescents who were followed up to 50 years. Both men and women who were
overweight at adolescence had increased age-specific morbidity and mortality relating to cardiovascular and other chronic diseases. Increased risk was also present even if adolescents who were obese had lost the excess weight during the adult period, suggesting that obesity during adolescence may set triggers that are associated with adverse risk in the adult.

Williams, C. L. (2001) clearly states, in obesity prevention, an emphasis on plant-based foods and vegetable and fruit consumption would be a major step forward in avoiding energy-dense foods. At different stages of development, we suggest the following components for obesity prevention:

- **Prenatal:** supply good prenatal nutrition and health care, avoid excessive maternal weight increase, control diabetes, help mothers lose weight postpartum, and offer nutrition education.
- **Infancy:** encourage increased breast-feeding and continuous breastfeeding to 26 months of age, delay introduction of solid foods until after 6 months of age, provide a balanced diet and avoid excess high-calorie snacks, and follow weight increase closely.
- **Preschool:** provide early experiences with foods and flavors, help develop healthy food preferences, encourage appropriate parental feeding practices, monitor rate of weight increases to prevent early adiposity rebound, and provide child and parent nutrition education.
- **Childhood:** monitor weight increase for height (slow down if excessive), avoid excessive prepubertal adiposity, supply nutrition education, and encourage daily physical activity.
- **Adolescence:** prevent excess weight increase after growth spurt, maintain healthy nutrition as the next generation of parents, and continue daily physical activity.
For children who are significantly overweight, the goal should be to reduce severity of obesity and to treat, reduce, and eliminate co-morbidities (e.g., hypertension, dyslipidemia, insulin resistance, and type 2 diabetes). For energy balance, measures are needed for children to lose weight or to slow down the rate of gain and to grow into their expected heights. This requires some reduction in energy intake and substantial increases in energy expenditure.

The world moves toward the higher fat and higher refined carbohydrate, Western diet! In country after country we and others have documented a marked shift in the structure of the diet (Kim et al. 2000, Monteiro et al. 1995, Popkin 1994, 1998, World Cancer Research Fund 1997). Most countries in Asia, Latin America, Northern Africa, the Middle East and the urban areas of sub-Saharan Africa have all experienced a shift in the overall structure of its dietary pattern with related disease patterns over the last few decades. Major dietary change includes a large increase in the consumption of fat and added sugar in the diet, often a marked increase in animal food products contrasted with a fall in total cereal intake and fiber. In many ways this seems to be an inexorable shift to the higher fat Western diet, reflected in a large proportion of the population consuming over 30% of energy from fat.

**Socio-Cultural issues and childhood obesity in India**

1. There is a general misconception in parents in India and other developing countries that an obese child is a healthy child. And that if the child is fat, “baby fat” will go away with time. In an effort to keep child “healthy”, he/she is fed in excess. Many of these children remain obese for life.
2. High burden of school work and academic competitiveness have led to decreased participation in sports and any other form of physical activity. This is particularly true for girls who are sedentary from school years. Many of the studies from India show that females have more obesity and the metabolic syndrome as compared to males.

3. The lack of appropriate play area and limited open space around home makes it difficult for children to stay physically active.

4. Parents are often overworked and find it easy to let children order “fast foods” and hardly have any time to oversee balanced nutrition for children.

5. Lastly, children spend more time in front of television and computers at the expense of sports and physical activity.

It is important to take into consideration the cultural factors that influence an individual’s beliefs about proper nutritional habits and physical activity behaviors. While nutrition and exercise have proven to be important and influential factors in defining the underlying causes of childhood obesity, the role of the home and parental guidance in contributing to unhealthy children’s weight development remains to be a less discussed point of interest. The following chapter will specifically explore the significance of the influence the parents have on children’s development of obesity; in particular, how the attitudes pertaining to proper nutrition and exercise that parents convey and model in the home can contribute to the health attitudes and weight patterns of their children.

2.1.3. THE ROLE OF PARENTS

There is abundant evidence supporting the idea that a child’s attitude towards healthy living habits is significantly related to those of their parents. The most common
The description of the socialization that occurs between child and parent is referred to as parental modeling. The Nutrition Research Newsletter (2001) defines parental modeling as a process of observational learning in which the behavior of the parent acts as a stimulus for similar behavior in his or her child. Important childhood behaviors such as good manners, proper hygiene, and other social norms are frequently modeled by parents in hopes that the children will internalize them and continue repeating the behaviors on their own.

The question is: how significant is the role of parents in modeling and encouraging healthy behaviors to children in regards to weight management and preventing childhood obesity? Tinsley (2003) recognizes that although parents represent only one of many possible socializing agents (e.g., peers, schools), socialization of health-related behavior occurs within the family, with parents' beliefs, attitudes, and behaviors substantially affecting their children's health behaviors. Further research by Tinsley (2003) indicates that parental modeling has been examined across a wide variety of youth health behaviors such as smoking, seatbelt use, and physical activity, and suggests that observational learning is in part responsible for the transmission of health promoting or risky behavior in children.

In most family-based behavioral weight loss programs for children, the obese child is the main agent of change, with varying degrees of parental involvement. We suggested previously that, if parenting style is the focus of treatment, the parents are the main agent of change, and they, rather than the child, should be targeted by the intervention. Exclusively targeting the parents in the interventions that had a family
health-centered approach led to weight loss in obese children (Golan M, Weizman A, Apter A, Fainaru M, 1998). Parents served as both a source of authority and a role model for their children. Parents provided an environment with fewer “obesogenic” factors and more self-regulation and healthy behavior practice. A program that omitted the obese child from direct intervention and targeted parents only was associated with greater weight loss and higher consumption of healthy foods compared with a program that treated children with the child-only condition, where they were the main agents of change (Golan M, Fainaru M, Weizman A., 1998).

One study conducted by Tibbs et al. (2001) examined the effects of parental modeling on children’s food intake by having parents answer multiple surveys and questionnaires to assess the frequency with which parents model dietary behaviors for their children. The results of the study indicate that parents reported greater frequency in sitting with their children at meals or eating foods they want their child to eat. However, they infrequently reported modeling the intake of low-fat snacks to their child or a willingness to set rules about how many fruits and vegetables their child should eat (Tibbs et al. 2001).

It seems reasonable to conclude from this research that parents are frequently inconsistent in their methods of modeling health behaviors to their children. Although eating at the family dinner table may help children eat healthily that particular evening, not learning to reach for low-fat snacks or fruits and vegetables may cause children to exhibit unhealthy eating behaviors when dining elsewhere than home (a friend’s house, at school, etc.). Tibbs et al. (2001) also believes it is worth noting that despite parental
reports of modeling, a majority of parents did not follow recommended guidelines on fat or fruit and vegetable consumption.

Perhaps part of the reason children are eating unhealthily is because they are not learning and internalizing correct nutritional guidelines from their parents. Since obesity most commonly begins in childhood between the ages of five and six, and during adolescence (AACAP 2008), it is alarming that parent’s are not setting stricter rules and actively encouraging and practicing healthy habits to their children during the early years of life in which it would be most beneficial.

As researchers continue to analyze the role of parenting both in the development of childhood overweight and in obesity prevention, studies of child nutrition and growth are detailing the ways in which parents affect their children's development of food- and activity-related behaviors. Ana Lindsay, Katarina Sussner, Juhee Kim, and Steven Gortmaker (2001) argue that interventions aimed at preventing childhood overweight and obesity should involve parents as important forces for change in their children's behaviors. The authors begin by reviewing evidence on how parents can help their children develop and maintain healthful eating and physical activity habits, thereby ultimately helping prevent childhood overweight and obesity. They show how important it is for parents to understand how their roles in preventing obesity change as their children move through critical developmental periods, from before birth and through adolescence. They point out that researchers, policymakers, and practitioners should also make use of such information to develop more effective interventions and educational programs that address childhood obesity right where it starts-at home. The authors review
research evaluating school-based obesity-prevention interventions that include components targeted at parents.

Although much research has been done on how parents shape their children's eating and physical activity habits, surprisingly few high-quality data exist on the effectiveness of such programs. The authors call for more programs and cost-effectiveness studies aimed at improving parents' ability to shape healthful eating and physical activity behaviors in their children. The authors conclude that preventing and controlling childhood obesity will require multifaceted and community-wide programs and policies, with parents having a critical role to play. Successful intervention efforts, they argue, must involve and work directly with parents from the earliest stages of child development to support healthful practices both in and outside of the home.

Children tend to eat what their parents eat, finds a new study that suggests a parental contribution to the growing obesity problem among young children and teenagers.

- It is important that parents demonstrate healthy eating habits and introduce a variety of nutritious foods to their children during the crucial years when children from eating habits and learn to regulate their food intake.
- At an early age, children will eat what they observe their parents, especially their mothers, eating.
- When parents provide early exposure to nutritious foods, even fruits and vegetables, children enjoy and eat more of such foods. Household food choices are important at this time.
It is generally recognized that one of the main causes of overweight and obesity in children is lack of exercise and physical activity. Recent data on physical activity for children age 9–13 indicate that approximately one fifth engage in no free-time physical activity (Duke, Huhman, & Heitzler, 2003). This means twenty percent of children are not participating in recreational sports or any other type of physical activity during their elementary and middle school years.

Giammattei et al (2003) also reported that children who spent more time watching television had a higher BMI and were physically less active. Unsafe roads, lack of free space for playing, increased television viewing and computer usage has made life sedentary (Bhave et al 2004).

Parents in India need to be aware of the overall impact of obesity in the future health of their children, and accordingly make necessary changes in the environmental factors that are in their control.

Indian parents and children have poor knowledge of various nutrients; fibre, saturated fat, transfatty acids etc. Wrong notions abound; fried Indian snacks (samosa, pakori in vanaspathy and vada,baji etc.,) are not considered unhealthy, mothers cook parathas frequently for children’s tiffins. It is important to reach out to mothers as far as education about nutrition and healthy lifestyle is concerned.

Studies demonstrated that when parents were targeted as the primary mediators of change, children aged 6 –11 years showed greater weight loss, an increase in the number of behavioural changes, and better retention of these changes (Golan et al. 1998). In these
studies parents served as both a source of authority and a role model for their children. Parents regulated the quality and pattern of the food environment (more fruit and vegetables and less high-sugar, high-fat foods), providing an environment with fewer obesogenic factors and more self-regulation and healthy practice (more physical activity and less sedentary activity). They set limits when appropriate and, by their behaviours and attitudes, served as role models for their offspring (Golan et al. 2001).

The role of the parents in regard to childhood obesity cannot be examined completely without mentioning the influence of genetics on a child’s weight development. The question of whether or not genes seriously influence a person’s risk of becoming obese is a hotly debated topic in today’s medical health field. Centers for Disease Control and Prevention (2010) states that science shows genetics play a role in obesity; genes can directly cause obesity in disorders such as Bardet-Biedl syndrome and Prader-Willi syndrome. Although these disorders are extremely rare, the existence of such disorders provides proof of a genetic link to obesity.

The American Academy of Child and Adolescent Psychiatry (2008) released information indicating that if one parent is obese, there is 50 percent chance that the children will also be obese; however, when both parents are obese, the child will have an 80 percent chance of being obese. Although these figures seem daunting, there is evidence to support that having an obese parent or obese parents does not mean a child is doomed to become obese.

The CDC (2010) explains that genes and behavior may both be needed for a person to be overweight. In some cases multiple genes may increase one's susceptibility
for obesity and require outside factors; such as abundant food supply or little physical activity in order to fully become obese. In other words, if children acquire genes from their parents predisposing them to obesity, a strict moderation of environmental factors (i.e. diet and exercise) can hinder children from ever developing obesity. Hill, J. (1998) elaborates on the idea of genetics and the current obesity epidemic, he states “Despite obesity having strong genetic determinants, the genetic composition of the population does not change rapidly.

Therefore, the large increase in obesity must reflect major changes in non-genetic factors." Basically, the current rise in obesity among the population is most likely due to changing environmental factors rather than genetics. Although it is tempting for parents or any individual for that matter to blame ‘bad genes’ for problems managing excess weight, the facts strongly suggest that “we should not forget that, while the genetic contribution to obesity is substantial, a large part of obesity susceptibility remains down to our lifestyle" (Loos 2010).

Parents can influence their children’s dietary practices, physical activity, sedentary habits, and body satisfaction by controlling availability and accessibility of foods, meal structure, food socialization practices, and food related parenting style. Knowledge of nutrition and modeling of behaviors and attitudes are also influential (Davison KK, Birch LL, 2001).

Mothers’ nutritional knowledge and concern for disease prevention was found to be associated positively with children’s fruit and vegetable consumption and negatively with children’s total energy and fat intake (Gibson EL, Wardle J, Watts CJ, 1998). Home
eating patterns have changed such that a greater proportion of income is spent on foods prepared outside the home. Eating away from home is becoming more common, and fast food restaurant use in particular is growing even more rapidly (French SA, Harnack L, Jeffery RW. 2003). In the early years of life parents are considered to be the primary socialization agent and the overseer for a child’s interaction with the larger environment. Children and adolescent are preparing more meals and shopping for groceries more often than they did in the past, often because more mothers are working and simply do not have time for food preparation.

Wilson (1994) states that parents play an essential role because they can exert external control, including social support and food management on children and even adolescents living at home. Surely children have the ability to control and manage their weight by their own doing, but the evidence strongly suggests that successful long term weight management is best achieved when parents take an active role in encouraging and modeling healthy behaviors, reinforce positive non-food reward systems, and offer themselves as a source of social support for their child.

Results from an Israeli study of 6 to 11 year-olds suggest that when parents take sole responsibility for managing child overweight, the prevalence of overweight at 8 years’ follow-up is approximately half that found when the child is required to implement lifestyle changes as part of the treatment program (Golan M, Crow S, 2004).

Parents should be the main change mediator in weight related interventions, because their involvement is crucial for the induction of a healthy environment, modeling of healthy eating and activity patterns, and improvement in the child’s practices and
weight status in the long term. A health-centered rather than weight-centered approach may be the most appropriate intervention for the treatment and prevention of childhood obesity.

Parents have a profound influence on their children by fostering certain values and attitudes, by rewarding or reinforcing specific behaviours, and by serving as role models. A child health and well being are thus enhanced by a home environment with engaged and skillful parenting that models, values, and encourages healthful eating habits and physically active lifestyle.

Economic and time constraints, as well as the stresses and challenges of daily living, may make healthful eating and increased physical activity a difficult reality on a day-to-day basis for many families.

Parents play a fundamental role as household policy makers. They make daily decisions on recreational opportunities, food availability at home, and children’s allowances; they determine the setting for foods eaten in the home; and they implement countless other rules and policies that influence the extent to which various members of the family engage in healthful eating and physical activity.

A study conducted by Padez C, Mourao I, Moreira P & Rosado V (2005) has shown that family structure, including the family size, birth order of the child as well as whether it is a single- or joint-parent family may have an effect on childhood obesity. However, relatively few studies have been undertaken and the results are inconsistent (Lobstein T, Baur L & Uauy R for the IASO International Obesity Task Force (2004). Parent–child interactions, the quality of the home environment and the level of care
provided within a family might also be affecting the behaviours related to the risk of obesity. These factors may have more of an impact on the risk of obesity than family structure or deprivation. For example, children with low cognitive stimulation are at an increased risk of subsequent obesity (Strauss RS & Knight J., 1999), as are children who suffer parental neglect. Parenting styles and behaviours may influence the food and exercise choices of a child. Each member of the family acts as a role model for the child, their behaviour reinforcing and supporting the development of diet and activity behaviours. The family members all share the same environment, which may encourage overeating or a sedentary lifestyle (Davis KK & Birch LL 2002). Dietary and activity behaviours have been shown to ‘run’ in families, primarily due to shared environmental factors rather than genetics, and parental diet and activity patterns can predict the risk of obesity.

It is crucial for parents to realize that they do share a part in contributing to their child’s obesity. If parents understand that their children do subtly pick up on the behaviors that they model, perhaps parents would be more willing to monitor their behaviors in ways that show a positive example to their child. Of course children do not prefer to eat broccoli or vegetables, but it is the parents job influence the child to consume vitamin rich foods they would not normally chose to eat on their own. Birch (1980) and Duncker (1983) sum up nicely, “For many children, eating is a social event that often times occurs in the presence of parents, other adults, older siblings and peers. In these contexts, children observe the behaviors and preferences of others around them. These role models have been found to have an influential effect on future food selection, especially when the model is similar to the child, or perceived as being powerful as in the
case of older peers.” Children are not yet old enough to realize the value of good nutrition, and it is clear that the parents are an instrumental part of setting children on the right track by teaching and modeling healthy lifestyle choices. However, this is not to say that parents are solely to blame; currently, childhood obesity is considered to be caused primarily by sedentary lifestyle and access to food or “fast food” with high fat and sugar content. Certainly these variables contribute to the childhood obesity epidemic, especially considering that the time period of the rise of technology and desire for fast, quick meals coincides with the generation of children being affected by this unfortunate disease.

There are multitudes of reasons that a child may become obese; the point being that parents have a larger influence on their child’s development of unhealthy eating and exercise habits than previously expected.

An important concept to consider after reviewing this research is that effort to reduce childhood obesity should be aimed at changing the health behaviors within an entire family with an obese child rather than focusing on altering the health habits of only the obese child. Since intervention is proven to be more successful with the support of the entire family, the perhaps this could have implications for prevention as well. Further research on this subject may want to examine whether or not parental modeling of healthy behaviors can prevent a child from developing childhood obesity. A very interesting study to conduct would be to observe the development of very young average weight children who have a genetic predisposition to becoming obese; examine whether consistent parental modeling of healthy eating and exercise in the home would create similar habits in young child so that their weight never reaches the point of becoming a pressing concern. As mentioned in the previous chapter, the longer an individual
maintains a heavier body weight, the more difficult it is to return to a lighter weight. Since it is relatively difficult for obese individuals to keep weight off once they have lost it, the answer may lie in preventing obesity from first developing. In the future, perhaps focusing efforts on early education of parents will allow the family to take necessary steps to prevent, rather than eventually diagnose and treat childhood obesity later down the line.

The influence of parental involvement in the development of childhood obesity is a less frequently discussed factor contributing to obesity, but there is no doubt that the role is extremely significant and worth conducting closer examination. Sure fast food can cause unhealthy weight gain, but where are the children obtaining this food from? The obvious answer is: the parents. Getting parents to take an active role in promoting good health habits to their children is necessary; children cannot do it on their own. Tibbs et. al (2001) agrees that strategies promoting frequent parental role modeling of healthful dietary behaviors need to be further assessed, and dietitians also need to emphasize to parents the importance of their own dietary behaviors in developing the long-term eating patterns of their children. Community based programs and school curriculum that educate children and parents about nutrition, exercise, and healthful lifestyle choices are certainly a good start. In addition to education, the support and encouragement children receive from their parents is crucial in combating childhood obesity.
Section B

2.2 Conceptual Framework

MODIFIED IMOGENE. I. KING’S GOAL ATTAINEMENT MODEL (1981)

Imogene. I. king’s bases her theory on general system theory, the behavioural sciences, deductive and inductive reasoning. Based on her assumption humans are open systems in constant interaction with their environment. This model has three interacting systems namely personal, interpersonal and social.

Personal system, which includes perception, self growth and development, body image, space and time. Interpersonal system includes interaction, communication and transaction, role stress and coping. Social system includes families, religious groups, schools, workplaces and peer groups. The other factors identified by the author were human values, behavioural patterns, needs, goals and expectations.

Concepts of the theory

King’s stated that the framework served several purposes, as it’s a way of thinking about the real world of nursing. An approach for selecting concepts perceived to be fundamental for the practice of professional nursing and shows a process for developing concepts that symbolize experiences within the physical, psychological and social environment in nursing. The human process of interactions formed the basis for designing a model of transactions and theoretical knowledge used by nurses to help individuals and groups to attain goals. Mutual goal setting between a nurse and a client is based on (i) nurse’s assessment of a client’s concerns, problems and disturbances in health (ii) nurse’s and client’s perceptions and the interferences; (iii) their sharing
information where by each functions to help the client attain the goals identified. In addition, nurses interact with family members when clients cannot verbally participate in the goal setting. Imogene. I. King’s views nursing as an observable behaviour found in the health care system in the society. The goal of nursing is to help individuals maintain their health so they can function their roles. Nursing is viewed as an interpersonal process of action, reaction, interaction and transaction, perceptions of a nurse and client also influence the interpersonal process.

Nursing uses a goal oriented approach in which individuals within a social system interact, the nurse brings special knowledge and skills to the nursing process and the client brings self knowledge and perceptions.

**Application of concepts in a study**

In this study, the concepts adopted are system, reaction, interaction, transaction and outcome.

**System**

Which comprises of personal system (Age, Sex, Education, Occupation, Religion, Income, Personal experience, Previous knowledge), Social system (Type of family – Nuclear or Joint family, Cultural factors, Neighbors’ and from peer groups), and interpersonal system (Contact with health personnel, Television, Radio, Newspapers, Friends & relatives).
**Interaction**

When the parents of obese children comes into contact with the nurse the next step of interaction takes place. The nurse and the parents of obese children start orienting to each other through interaction.

**Reaction**

The nurse and the parents of obese children reacts to each other and recognizes and perceives the learning needs through verbal and non-verbal communication. Results of this reaction, the nurse and the parents of obese children mutually set a goal to enhance the knowledge on childhood obesity and to comply with weight reduction measures.

**Transaction**

It refers to implementation of Information, Education and Communication (IEC) teaching module on childhood obesity through laptop assisted teaching and the booklet on the same was issued for reinforcement for study group along with routine information. The control group received only the routine information.

**Outcome**

It refers to the validation of the transaction intervention and the net result of positive outcome of parents of obese children as measured by increased level of knowledge, attitude and compliance. The negative outcome may be decreased level of knowledge, attitude and compliance. For the negative outcome the feedback is given in a dotted line.
Assumption of this study is that, if a parent of an obese child undergoes IEC module on childhood obesity, it results in increased knowledge, attitude and compliance. The conceptual framework is framed based on the formulated hypothesis.
CONCEPTUAL FRAMEWORK BASED ON KING'S GOAL ATTAINMENT MODEL (1981)

SYSTEM
- Personal
  - Age
  - Sex
  - Education
  - Occupation
  - Religion
  - Income
  - Personal experiences
  - Previous knowledge

INTERACTION
- Social
  - Type of family
  - Nuclear joint
  - Cultural factors

REACTION
- Interpersonal system
  - Contact with health personnel
  - Television
  - Radio
  - Newspapers
  - Friends & relatives

TRANSACTION
- Parental awareness
- Nurses

OUTCOME
- LAPTOP
  - Teaching on childhood obesity through IEC module
  - BOOKLET
  - For reinforcement
  - Routine information

- Study group
- Control group

FEED BACK

PERCEPTION
- Perceive the need to teach regarding child obesity.
- JUDGMENT
  - Prepares the appropriate method to teach about childhood obesity
  - ACTION
    - Develops the IEC module on childhood obesity

PERCEPTION
- Perceive the need for information on child obesity.
- JUDGMENT
  - Analyzes the need for knowledge & weight reduction of their obese children
  - ACTION
    - Seeks information on childhood obesity

POSITIVE
- Increased knowledge
- Favorable attitude
- Increased compliance towards childhood obesity

NEGATIVE
- No change in the knowledge, attitude & compliance level regarding childhood obesity