Introduction

1. INTRODUCTION

Childhood is a crucial period in the life cycle of an individual. It is an important period for the health interventions as health-related behaviours are just in formation, and it seems possible to intervene for preventing the development of lifestyle disorders.

Childhood obesity is one among the primary priority programmes of the World Health Organization and is the most serious public health challenge of the twenty first century. The problem is global and is steadily affecting many low and middle income countries, particularly in the urban settings. An alarming rate of increase is seen with an estimated 22 million children under the age of five years being overweight throughout the world and is further expected to rise by 2020 (http://www.who.int/childhood/en/childhood overweight and obesity).

Childhood obesity is one of the major public health problems in the modern world. In the period 2003 to 2006, 32 percent of the US children were classified as obese or overweight, and increasing trends in childhood obesity were seen all over the world. The results are alarming as overweight children show a high risk of becoming obese adults.

Childhood obesity is an emerging pandemic of the new millennium. This has profound public health consequences, as 70 percent of the overweight children become overweight adults. Obesity is defined as an excess of body fat as measured by Body Mass Index (BMI) ratio in adults – this is calculated by dividing weight in kilograms by height in meters squared. In adults, a BMI over 25 is classified as overweight and over 30 as obese (classes I, II or III or moderate, severe or morbidly obese).

Historically, a fat child means a healthy child, one who is likely to survive the rigors of under nourishment and infection. But unlike the past, today obesity or over weight in childhood is considered as a major health risk condition developed mainly due to malnutrition and improper lifestyle, which can lead to a number of health problems both in childhood and later in

adulthood. According to Swaminathan (2000) a person whose body weight is higher than normal by 15-20 percent is considered as overweight and by 25 percent is considered as obese. A child is considered as obese when the total body weight is more than 25 percent fat in boys and 32 percent in girls. Obesity is an increasingly prevalent nutritional disorder throughout the world. The increasing prevalence of obesity and over weight is a major public health problem in industrialized countries.

Over the last few decades there has been a worldwide increase in paediatric obesity affecting both developed and developing countries. Excess adiposity at a young age is linked to immediate and long-term health risks, including increased risk of asthma and Type II Diabetes Mellitus, and because of the persistence of the condition into adulthood, increased middle-age mortality and morbidity regardless of adult weight status. Socio Economic Position is linked to adiposity but the relationship is complex and varies with age, population, sex, ethnicity and the type of adiposity indicator.

A recent review of cross-sectional studies published between 1990 and 2005 found that socioeconomic position was inversely associated with children's overweight or obesity in 42 percent of the reviewed studies, with another 31 percent reporting a mixture of inverse and no associations. The choice of socioeconomic position indicator clearly influenced these relationships and parental education showed the most consistent inverse relationship with children's obesity risk.

Obesity is the major cause for other problems. Nearly 50 percent to 70 percent of the children will become obese adults and would suffer from diabetes, stroke, liver diseases, infertility, hypertension, arthritis and cancer. Children, who were obese, also have a high risk for the development of early heart diseases. Obesity has reached epidemic proportions globally. More than 1 billion adults are overweight, and at least 300 million of them are clinically obese. Significantly, obesity is increasing rapidly in developing countries undergoing rapid nutrition and lifestyle transition, and it often coexists with under-nutrition.

The rising prevalence of obesity in developing countries is largely due to rapid urbanization and mechanization which has led to reduction in the energy expenditure along with an increase in energy intake due to increased purchasing power and availability of high fat, energy-dense fast foods. Obesity is associated with increased risk of the metabolic syndrome, Type 2 Diabetes Mellitus (T2DM), hypertension, dyslipidemia, Poly Cystic Ovarian Syndrome (PCOS), and Coronary Heart Disease (CHD). Some of these metabolic derangements start in childhood.

There is a general misconception in parents of India and other developing countries that an obese child is a healthy child. In an effort to keep child "healthy", he or she is fed in excess. Many of these children remain obese for life.

The obesity epidemic is not restricted to industrialized societies; this increase is often faster in developing countries than in the developed world. The rising epidemic reflects the profound changes in society and in behavioural patterns of communities over recent decades. While genes are important in determining a person's susceptibility to weight gain, energy balance is determined by calorie intake and physical activity. Thus societal changes and worldwide nutrition transition are driving the obesity epidemic. Economic growth, modernization, urbanization and globalization of food markets are just some of the forces thought to underlie the epidemic.

Childhood obesity is already an epidemic in some areas and on the rise in others. Kosti and Panagio (2006) reported that, worldwide over 22 million children under the age of five are severely overweight and one in ten children are overweight. This global average reflects a wide range of prevalence levels, with the prevalence of overweight and obesity in Africa and Asia averaging well below ten per cent and in America and Europe above 20 per cent . In the European Union, the number of children who are overweight is expected to rise by 1.3 million children per year, with more than 3,000,00 becoming obese each year. By 2015, it is estimated that 30 million children in European Union countries will be overweight, including 8.4 million who will be obese.

Interestingly as Onis and Bloesner (2000) point out, countries with the highest prevalence of overweight and obesity in children are located mainly in the Middle East, North Africa, and Latin America. Countries with high wasting rates tend to have low overweight rates and vice versa.

Obesity in urban kids of India has increased from 16 percent to 24 percent from 2002 to 2007.Childhood obesity is tilting the scale against children in urban Delhi. A latest survey finds them more overweight and unhealthier than those surveyed nearly half a decade ago. The overall prevalence of overweight or obesity in urban children in Delhi has shown an increase from 12 per cent in 2002 to about 20 per cent in 2006 to 07. The prevalence was found to be 25 per cent in private schools and 7.3 per cent in government funded schools. Obesity is high among the affluent class in India and children develop obesity even at the age of six. Alarmingly many obese children in the age group of 13 to 14 years face the risk of cardiac disorders too. The prevalence of childhood obesity in Bangalore is on the rise to an extent that at least six obese children every month are going through cardio-vascular exercises three times a week (Barbara, 2007).

World Health Organization (2006) reasons out that the increasing prevalence of childhood obesity results from changes in society. Though mainly associated with unhealthy eating and low levels of physical activity, the problem is linked not only to children's behaviour but also increasingly to social and economic development and policies in the areas of agriculture, transport, urban planning, environment, food processing, distribution and marketing, as well as education. Many low and middle-income countries are now facing a double burden of disease; as they continue to struggle with the problems of infectious diseases and under nutrition. At the same time these countries are experiencing a rapid increase in risk factors of Non Communicable Diseases (NCDS) such as obesity and overweight, particularly in urban settings. It is not uncommon to find under nutrition and obesity existing side-by-side within the same country, the same community and within the same household in these settings.

The double burden is caused by inadequate or over pre-natal, infant and child nutrition which is followed by exposure to high fat, energy dense, micronutrient-poor foods and lack of physical activity as the child grows older. Nutrition and lifestyle transition are driving childhood obesity into an epidemic. Community based interventions are aimed at providing a conducive environment for children to follow a healthy lifestyle, promote healthy food alternatives, and bring awareness and need about an increase in physical activity. Increased consumption of more energy-dense, nutrient-poor foods with high levels of sugar and saturated fats, combined with reduced physical activity, have led to rise in the obesity rates.

Poor dietary habits in children are acknowledged with less or no physical activity at all, which is why television, computer and videogames are termed as "Global Markers" for identifying obese children. Limited open space around home makes it difficult for children to stay physically active. 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.

Numerous studies have also shown that yet another factor that contributes to childhood obesity is the infant nutrition period that includes various factors like maternal health and infant's health status before and during pregnancy along with pre-natal and post natal nutritional status of the mother of child. Treating gestational diabetes during pregnancy may reduce the child's risk of becoming obese and gestational diabetes is associated with increased rate of offspring childhood obesity, impaired glucose tolerance and Type II Diabetes Mellitus (http://www.medscape. com/viewartick/562238).

Post natal rapid weight gain has been suggested to be a risk factor for later obesity warns Kamanika (2003). A general result in the obesity literature shows that even urbanization leads to obesity in children which is characterized by factors like family size, birth order of the child, type of family, maternal employment, dietary habits of the parents of the whole family. Obese mothers are likely to over feed their infants and interact with them less- according to a new research (Lilith, 2009). High female labour participation

rates lead to higher obesity rates in children. Working mothers, particularly the highly educated are more likely to have obese children.

Obesity prevalence is highest among those who watch four or more hours of television per day particularly largely among girls. In addition, children who are being driven to school and low participation rates in sports and physical education; especially girls are found to be more overweight or obese (Anderson, 2002).

Obesity in children leaves long lasting imprints of low self esteem, negligence in family, peer group and society. Psychosocial difficulties such as discrimination from others, negative self image, depression and decreased socialization are other problems. David (2004) warns that one in three obese children have excess fat in their liver, which could lead to hepatitis, cirrhosis or liver failure.

As part of the response to fight the childhood obesity epidemic, World Health Organization developed the Global Strategy for Diet, Physical Activity and Health (DPAS) at the request of World Health Organization member states which was endorsed by the 57th World Health Assembly in May 2004. The strategy aims to significantly reduce the prevalence of childhood obesity and their common risk factors, primarily unhealthy diet and physical inactivity. It calls upon all stakeholders to take action at global, regional and local levels. WHO expert meeting on childhood obesity (Kobe, Japan, 20-24 June, 2005) decided the strategies to address childhood obesity and to address it particularly in school settings and to invest in improving maternal and early childhood health and nutrition to prevent childhood obesity as well as weight problems later in life.

The most desirable goal for childhood obesity is to prevent children with normal Body Mass Index from becoming overweight or obese. Prevention and treatment strategies should include lifestyle changes, behaviour or attitude modification and medical nutrition therapy for the kids.

Family studies have shown that obesity runs in families, although more detailed twin, adoption and family studies have shown that genetic differences

between individuals explain a major proportion of the within-population variation in Body Mass Index (BMI, kg/m^2) in adulthood. Genetic factors have an important role in childhood obesity, but their role may be different or they may result from other genes than those that operate in adulthood (Shan, 2009).

The environmental factors shared by family members, such as co-twins in twin studies, have shown only a slight effect on the variation of adult BMI. It may have a more important role in childhood, where parents and the offspring live together and where siblings obviously have a much greater opportunity to be exposed to the same environment. The role of environmental factors in the formation of childhood obesity has important public health consequences as it may provide additional targets for effective interventions in childhood obesity (Angeline, 2008).

Childhood obesity is associated with several metabolic and endocrine derangements including glucose intolerances, hypertension and dyslipidemia that predispose to early development of cardiovascular diseases, type II diabetes and non alcoholic fatty liver disease. As a result obesity now accounts for approximately 4,000,00 deaths per year, secondary only to tobacco.

Medical Nutrition Therapy refers to specific nutrition procedures including assessment and interventions in the treatment of an illness, injury or disease condition. Medical nutrition therapy procedures define the level, content and frequency of nutrition services that are appropriate for optimal care and nutrition outcomes (Ome, 2009).

A research on childhood obesity must consider differences in socio cultural values, beliefs, and practices among ethnic groups within a community. Childhood obesity prevention efforts may include studying sustainable collaboration between health, education, business, agriculture, policy makers, and families, targeting children in early primary grades, engaging children in designing interventions, developing community-based interdisciplinary centres for the prevention and treatment of childhood obesity,

increasing access to culturally acceptable physical activity opportunities for families, increasing access to affordable healthy food options by families and increasing access and use of quality healthcare.

As childhood obesity is gaining dangerous significance in causing earlier onset of lifestyle and degenerative diseases, it is of utmost importance to create awareness among parents about childhood obesity and to take viable measures to bring down the prevalence. Earlier a chubby child was considered to be healthy and the mothers had pride in having a chubby child, but now the lifestyle and nutrition transition have forced us to see the other part of the life pattern of children. For no reason of their own, should children fall victims of health problems is the question put forth before us.

Tamil Nadu has made significant strides in improving the health status and increasing access to health care services in the last decades. Nonetheless, it continues to face major challenges growing burden of non-communicable diseases, quality of care and equity issues as well as health financing issues in the State. Kerala has made remarkable achievement on par with the developed countries in the field of women and children's health during the last few decades. However, overweight and obesity is a growing health concern in Kerala too; the consequences of which can cause disaster to the future generation. It is crucial to further understand the background mechanisms of childhood obesity to find even more effective measures to prevent it before it begins to produce more or less irreversible health damages.

Considering the threats of overweight and obesity in this cyber era, the present study was carried out in selected schools of Kerala and Tamil Nadu among the children between the age group of 5 to 10 years to analyze the diet and lifestyle of obese children. Keeping these in mind the study was focused on the following objectives to:

- Compare the socio economic status of selected obese children in the states of Kerala and Tamil Nadu

- Elicit dietary habits and life style pattern of obese population in the two states and compare
- Assess the risk factors that contribute to childhood obesity in both the states
- Explore the association of childhood obesity with various risk factors
- Study the prevailing rate of childhood obesity among tribes and analysing the contributing factors
- Impart Medical Nutrition Therapy to the parents of obese children and assess its impact
- Analyse the difference between the nutritional knowledge of parents in Kerala and Tamil Nadu.