Review article

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Obesity and its Consequences among Adolescents

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ABSTRACT

Obesity is a serious health problem with an increased prevalence over the past 20 years. Overweight and obesity represents a rapidly growing risk to the health of the population including children and adolescents in many developed countries worldwide. Adolescence is a crucial phase for growth and many serious diseases in adulthood have their roots in teenage. Studies suggest that a lack of awareness about obesity among children is one of the prominent causes of childhood obesity. This can lead to a multitude of chronic diseases such as hypertension, diabetes mellitus, and chronic kidney disease. Likewise, childhood and adolescent obesity results in psychosocial consequences such as deterioration in cognitive abilities, school performance and quality of life, compounded by stigma, discrimination, and bullying. Studies that employed nutritional education as an intervention strategy have reported an improvement in nutritional knowledge, attitudes and eating habits, as well as decrease in obesity. Therefore, this review aims to sensitize and draw attention to the understanding of obesity and overweight. For this article, various studies related to obesity in adolescents were reviewed. The study has generated baseline information for those who are interested to work and promote health and positive development of adolescents.

Keywords: *Obesity, Adolescents, Health*

INTRODUCTION

According to world health organization (WHO), overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. The most used measure for overweight and obesity is the body mass index (BMI) – a simple index to classify overweight and obesity in adults. It is defined as the weight in kilograms divided by square of the height in meters (kg/m^2). The BMI provides the most useful population- level measure of overweight and obesity, as it is the same for both gender and for all ages of adults. BMI greater than or equal to 25 is considered overweight and BMI greater than or equal to 30 is considered obese.[1] Similarly, percentiles and z-scores are often used to assess anthropometric measures to help evaluate children's growth and nutritional status.[2] Obesity is being recognized as a significant risk factor for various chronic illnesses, ranging from premature death to chronic condition which ultimately affects quality of life. These include coronary heart disease, hypertension and stroke, certain type of cancer, dyslipidemia, and respiratory diseases including sleep apnoea. Beside these physical problems, obese people also suffer from various psychological problems.[3]

Obesity in children and adolescents is rising, alarming, and approaching epidemic proportion in many economically developed countries. Likewise, in developing countries, this issue is emerging as a public health crisis. According to a current report, out of an estimated 43 million obese children worldwide in 2010, approximately 81% were from developing countries, half of which (18 million) were reported to be living in Asia despite of huge burden of under nutrition. In 2020, it was estimated that the global prevalence of childhood obesity will reach approximately 60 million.[4] The childhood obesity has now recognized as a worldwide health problem because of its overwhelming consequences and its prevalence is mounting at uncontrolled rate. The childhood obesity has now recognized as a worldwide health problem because of its overwhelming consequences and its prevalence is mounting at uncontrolled rate.[5]

This epidemic of childhood obesity is of serious matter because, it is likely that excess weight will adversely affect health in adulthood.[4] With no exception to Nepal,

childhood and adolescent obesity is on rife. It can be assumed that the burden of the obesity may be mounting in Nepal as transformation of Nepalese society towards rapid urbanization, modernization lifestyle and dietary modification. If the proper attention is not allotted in the prevention and treatment of childhood and adolescent obesity, it may cause devastating outcomes among the population with large spending on the treatment of the complications associated with childhood obesity in the coming future.[6]

Studies have revealed that obesity among children was found to be associated with limited nutrition knowledge and unhealthy eating habits and among various barriers to a healthy lifestyle among obese adolescent, lack of knowledge is one of the common environmental barriers.[7] Many studies have also concluded that the dearth of knowledge about obesity and lack of motivation among children is one of the causes of childhood obesity.[8] Multiple studies have revealed that children's level of knowledge is strongly associated to obesity. In order to promote healthier eating habits and consequently to decrease the rates of obesity, knowledge about food, nutrition and healthier physical activity is believed to be important.[7]

METHODS

An integrative review was conducted of empirical literature available in PubMed, Google Scholar, ProQuest, Hinari, NepJol and other databases. The key words used in search were adolescents, obesity and overweight; factors associated with obesity in adolescents; social context and obesity in adolescents; family and obesity in adolescents; peers and obesity in adolescents; prevalence of obesity among adolescents; consequences of obesity among adolescents; and knowledge level regarding obesity among students. The articles published in English language from 1998 to 2020 and those full text available were included. Collated information was summarized into the given headings as the results of this study.

RESULTS AND DISCUSSION

Overweight and obesity signify a rapidly growing threat to the health of population in an increasing number of countries. Indeed, they are now so common that they are replacing more traditional problems like under nutrition and infectious disease as the most significant causes of ill health. The epidemic of obesity took off from about 1980 and it has more than doubled since then i.e. from 857 million in 1980 to 2.1 billion in 2013.[9] Among men, the proportion has risen from 29.8% to 38% during same period. Men were more likely than women to be overweight or obese in developed countries, whereas the reverse was true for developing countries.[10] Moreover, obesity increased in women in other south Asian countries, including Nepal and Bangladesh, between 1996 and 2006 (from 1.6% to 10% and from 2.7% to 8.8% respectively).[11] The population-based studies in the neighbouring countries like China and India revealed the increased trend of childhood overweight and obesity. For example, a study from New Delhi shows that the prevalence of childhood obesity increased from 16% to 24% between 2002 and 2007.[12]

An imbalance between energy expenditure (physical activity) and energy intake (diet) leads to overweight and obesity. Because of obesogenic environments, psycho-social variables, and genetic variants, obesity is typically a complex disease. One significant etiological factor (diseases, drugs, immobilization, iatrogenic treatments, monogenic disease/genetic condition) can be found in a subgroup of individuals. A lack of safe and easy physical mobility into everyone's daily life, a lack of an adequate legal and regulatory environment, and structural factors that limit the availability of healthy, sustainable food at locally affordable prices are all predisposing factors to the obesogenic environment that increases the likelihood of obesity in individuals, populations, and various settings. Simultaneously, the inability of the health system to detect excessive weight gain and fat deposition in their early phases is making the development of obesity worse.[13]

As Aryal, 2010 stated that there is no information on the magnitude of affliction due to overweight and obesity among children in Nepal. It is true that several nationality representative nutrition surveys have been conducted, their attention was on underweight. Rates of overweight and obesity were rarely reported.[6] A study carried out in India among 5664 adolescent students showed that obesity prevalence among boys is higher than girls i.e. 2.9% and 1.4% respectively. In the same study, prevalence of obesity is higher in middle to higher SES group than lower socioeconomic status (SES) group.[14] In contradiction, another study conducted in 2577 school students in Iran revealed that overweight and obesity was more common in girls from low socioeconomic areas.[15] A study on influence of physical activity, socioeconomic status, and ethnicity on the weight status of adolescents unveiled that among 2289 adolescent, vast majority of them (75%) watch TV during leisure time. This study has also revealed that more the TV viewing increased, more the BMI.[16] A study conducted to assess prevalence of risk factors of non-communicable diseases among adolescents in Parsa district of Nepal concluded that

adolescents are following high risk practices and have non-communicable diseases like hypertension and obesity which are not usually diagnosed and paid attention to.[17]

A multicentric study conducted in 5 cities of India covering 38,296 students, aged 8-18 years, also found that higher socio-economic status was significantly associated with overweight and abdominal obesity; the overall prevalence of overweight and obesity was 24%.[18] Similarly, children having family history of obesity are more likely to become obese or overweight. Children whose parents or other family members are overweight or obese are more likely to follow suit.[19] Overweight and obesity is leading risk for global deaths and around 3.4 million adults die each year as a result of being overweight or obese. Overweight and obesity are linked to more deaths worldwide than underweight. For example, 65% of the world population lives in countries where overweight and obesity kills more people than underweight. In addition, 44% of the diabetes burden, 23% of the ischemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity.[20] Another particular concern of childhood obesity is stigmatization and its negative consequences such as stereotypes, bias, rejections, and prejudices towards obese children. Stigma and social rejection can indirectly lead to low self- esteem, feeling of loneliness and anxiety.[21]

Childhood and adolescent have been proposed as critical period for the development of obesity.[22] Childhood and adolescent obesity lead to a wide range of psychosocial and medical consequences.[23] The physical, social, and emotional well-being, as well as the self-esteem of children, can be significantly impacted by childhood obesity. Furthermore, it has been linked to poor academic achievement and a reduced standard of living for the child. There are also several co-morbid illnesses that are encountered in combination, including metabolic, cardiovascular, orthopaedic, neurological, hepatic, pulmonary, and renal disorders. Similarly, adolescent depression can be triggered by obesity.[24] Studies have revealed that cardiovascular disease risk factors are apparent among obese children.[25] Some studies conducted in USA to assess childhood body mass index and subsequent physician-diagnosed asthma concluded that overweight and obese children have 40-50% increased risk of asthma compared to normal children.[26]

A study in Taiwan found that the risk of sleep apnea was significantly higher in obese children than normal children.[27] Knowledge about food, nutrition and healthier physical activity is believed to be important in order to promote healthier eating habits and decrease the rate of obesity.[7] A study conducted in Rajasthan, India found that 93% of adolescent students had below average knowledge about obesity, 6% had average knowledge, 1% had good knowledge, and about 84% of them had moderately favourable attitude. Significant association was observed between levels of knowledge of adolescent students with regards to their age, gender, area of residence, monthly income, and type of family.[28] Another study showed higher knowledge scores emerged in favour of adolescent from wealthier family and suggest a need for more obesity education programs for adolescent, especially for those living in poverty.[29] This is supported by a study that concluded that the adolescents whose family income was more than Rs 15000 had more knowledge regarding obesity than those whose family income was below Rs 5000.[28]

A study was conducted among adolescent of Egypt showed that more than half of the respondents (53.5%) got fair knowledge regarding healthy lifestyle while good knowledge was reported only by 12.3 % of them.[30] Similarly, a study conducted in Kaski, Nepal showed that 78.3% of the adolescents had inadequate knowledge regarding obesity whereas only 21.7% of adolescents had adequate knowledge regarding obesity, 75% had knowledge regarding meaning of obesity and 59.2% had mentioned high calorie intake as a risk factor of obesity. Similarly, 52.5% adolescents stated diabetes mellitus is a consequence of obesity, and 98% mentioned that regular exercise is a preventive measure of obesity. Prevention is better than cure, it is better to address the problem of childhood obesity before it turns into epidemic.[6] It is imperative to be cautious about health status of adolescent in this early phase of life and start full flagged screening of the adolescent population to minimize severe problems in future.[17]

Prevention of obesity in children is easier than the adults. It has been observed that the health problems of adult obesity can be prevented, if obesity is controlled in childhood.[31] It is important for children to develop healthy behaviours at a young age so that unhealthy behaviours at a young age so that unhealthy behaviours do not carry over into their adult lives. If childhood obesity is managed and prevented earlier, devastating consequences caused by childhood obesity in adulthood can be halted. Consumption of junk food, high fat and high energy food should be avoided and increase the consumption of fruits and vegetables, as well as legumes, whole grains and nuts should be encouraged. Daily breakfast consumption with healthy food choices should be encouraged in growing children and adolescents to

prevent adiposity during these critical years of growth. Sedentary lifestyle should be discouraged and increased physical activities such as outdoor games should be encouraged. Nutritional and lifestyle education should begin already in childhood.[19, 32, 20]

CONCLUSIONS

Obesity is a severe health concern in the modern world. Globally, childhood and teenage health is at danger due to overweight and obesity, which is a condition that is increasing exponentially. One of the prominent reasons of childhood obesity is lack of knowledge on obesity and healthy eating practices. Therefore, it is crucial to implement comprehensive nutritional education aimed at encouraging healthy eating habits, along with targeted programs for adolescents to raise awareness regarding the adverse effects of obesity and overweight.

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