

Association between body mass index and health related quality of life among adolescents

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ABSTRACT

Quality of life (QOL) is the general well-being of individuals and societies, outlining negative and positive features of life. It observes life satisfaction, including everything from physical health, family, education, employment, wealth, religious beliefs, finance and the environment (Barcaccia and Barbara, 2013). According to the World Health Organization (WHO), quality of life is defined as the individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals. The age of onset for 85% of all eating disorders is between 11 and 20 years and eating disorders have been found to be associated with overweight in adolescents (Neumark-Sztainer *et al.*, 2000). The present study was conducted among hundred adolescent subjects in the age group of 15-18 years from Thrissur district. Subjects were selected by purposive sampling techniques from various colleges and a specially designed questionnaire was formulated to elicit the demographic details, medical history, and dietary pattern analysis and biochemical profile of the subject. The anthropometric data revealed that only 37% of the respondents had BMI within the normal range and 47% had their waist hip ratio above 0.85. Majority of samples prefers junk and unhealthy foods than healthy and nutritious food. The health related quality of life of the subjects were analysed using KIDSCREEN score and analysis of mean scores revealed the association between the BMI and HRQoL among the adolescents. The results showed that respondents within the ideal BMI obtained higher scores and corresponded to a higher level of health related quality of life and their obese counterparts obtained the minimum mean score.

Key Words : Body mass index, Health, Adolescents, Quality of life, WHO

INTRODUCTION

Adolescence is a transitional stage of physical and psychological development that generally occurs during the period from puberty to legal adulthood. According to the World Health Organization (WHO), quality of life is defined as "the individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals. Studies have directly examined the relation of childhood obesity and health related QOL (HRQOL), defined as "the physical, psychological, and social domains of health that are influenced by individual experiences, beliefs, expectations, and perceptions (Williams, 2000) The assessment of quality of life (QOL) in adolescents has become increasingly important as the mortality rates associated with various chronic diseases have decreased and survival rates have increased (Pan-tell and Lewis, 2000). Additionally,

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both children and parents reported lower physical and social functioning scores for obese children compared to normal weight children (Williams *et al.*, 2005). Behavioural factors such as lack of physical exercise, sedentary behaviour, and poor dietary choices have been cited as common risk factors for weight gain, although psychological and mental health factors also factor into the equation (Stice, 2005). Compared to normal weight peers, obese children and adolescents are more likely to develop several chronic diseases which usually occur later in life. Obese children and adolescents are often stigmatized and discriminated against in society, resulting in increased loneliness, sadness, and social isolation (Strauss, 2000).

METHODOLOGY

Hundred adolescent subjects aged between 15-18 years were selected by purposive sampling method from Thrissur district and their details were examined. A specially designed questionnaire was formulated to elicit the demographic details, menstrual details, dietary pattern analysis and clinical assessment of the subjects. Basic anthropometric measurements like body mass index and waist circumference were recorded. Dietary assessment was done by food frequency score and 24 hour recall method. Food consumption pattern of the subjects were studied with respect to their food habits, frequency of use of food items and food and nutrient intake of the subjects. The results of the study were analyzed using KID SCREEN score (Erhart *et al.*, 2009) to assess the association between the selected parameters.

RESULTS AND DISCUSSION

Demographic and personal details :

The study revealed that 53% were 18 years and 47% of subjects belonged to 15 years. A study conducted by the Indiana University of Health (2008) showed that age of 15 and 18 is time of intense emotions and intense relationship with peers. Majority belonged to rural areas near Thrissur district and 89% of respondents' belonged to nuclear families. To elicit the socio economic status of the subject's details regarding information on age, family, type of family, and total income were collected. It has been suggested that the importance of parental background for a child's education is due to more specific characteristics of the school system such as stratification and early tracking of students according to ability (OECD, 2008). From the study it was revealed that parents were engaged in business, private jobs and fewer numbers had government jobs. Olayinka (2003) found that children with low socio economic status view education and occupation as a means to better their status and economic conditions while children with high socio economic status view education and occupation as a means of entering into a profession similar to their parents.

Researchers have identified several changes in sleep patterns, sleep/wake systems and circadian timing systems associated with puberty (Carskadon, 1999). Finkelstein (2009) reported that compared to those sleeping eight hours per night, those sleeping less than six hours per night are significantly less likely to eat breakfast (85 % vs. 66 % in the eight -hour group), significantly less likely to have four servings of fruits and vegetables per day (78 per cent vs. 66 per cent in the eight hour group), and significantly less likely to have at least three meals per day (76% vs. 63% in the eight-hour group). The results reveal that only 24% had the habit of sleeping 6 hours and less. Fifty per cent of the subjects were engaged in regular walking and 15% spend 30 min for practicing sports, dancing and cycling.

Anthropometric and clinical details :

According to WHO (2012) anthropometry provides the single most portable, universal applicable, inexpensive non-invasive technique for assessing the size, proportions and compositions of the human body. Anthropometric indices like BMI and waist circumference were recorded. The results reveal that 37% of the respondents had BMI within the normal range, 24% underweight and 36% belonged to overweight category and 3% were in category of class 1 obesity. Lee *et al.* (2005) stated that overweight and obese children are not only at risk for insulin resistance syndrome, hypertension, dyslipidemia and hypertriglyceridemia, but also for poor micronutrient status. Majority of the subjects (47%) have a waist hip ratio above 0.85 which indicates abdominal obesity among those subjects. The clinical assessment details of the subjects reveals 18 per cent were suffering from hair fall and 12 per cent have dry hair and 7 per cent had pale eyes 5 per cent had spoon shaped nails which is symptomatic of anemia.

The Fig. 1 shows that 31% of subjects had standard height and 22% of the respondents had standard weight.

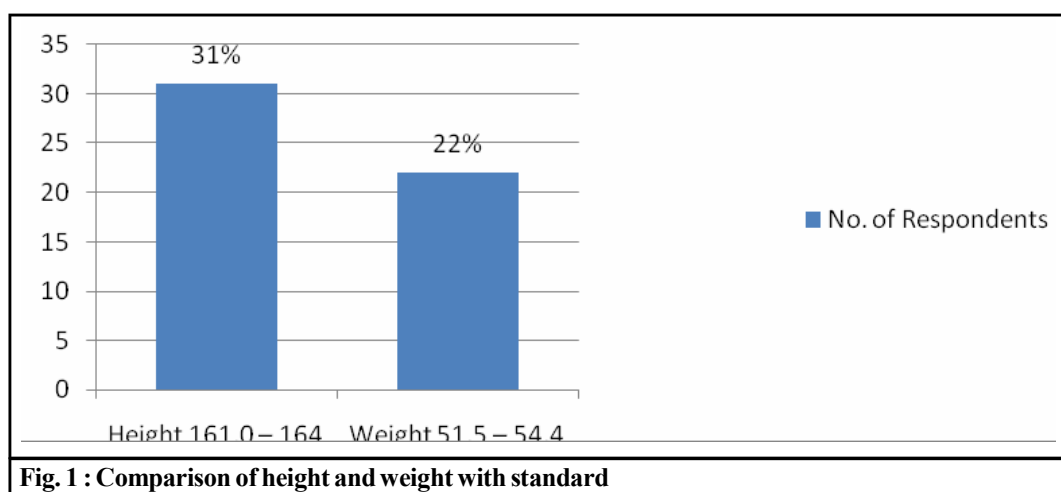


Fig. 1 : Comparison of height and weight with standard

Menstrual details of the subjects :

It was observed that majority (82 %) of the respondents had attained the age of menarche between 12 – 13 yrs. The mean age of menarche varies from one setting to another and is known to be a sensitive indicator of various characteristics of population including socio – economic status, nutritional status, geographical location and environmental conditions (Kaltiala *et al.*, 2003). 78 per cent of the respondents had regular periods. Dawn (2000) found that by the age of 17-18 years, menstrual cycle usually becomes regular. Some teens may develop irregular periods – or stop having periods altogether – as a result of certain medications, excessive exercise, very low body weight, or not eating enough calories or may develop problems as a result of a hormone imbalance. Disorders of the thyroid gland can cause menstrual irregularities if the levels of thyroid hormone in the blood become too low or too high (Hirsch, 2013). 9 per cent subject had low menstrual periods and 10 per cent of them had heavy menstrual periods. Menstrual problems are common, and can be disruptive to a woman's daily life and productivity (Walraven, 2001). Among the subjects 33 per cent of the subjects suffer from depression and 80 per cent suffer from stomach pain. During adolescence, dysmenorrhoea leads to high rates of absence from school and non-participation in

activities (Mark and Gluckman, 2006).

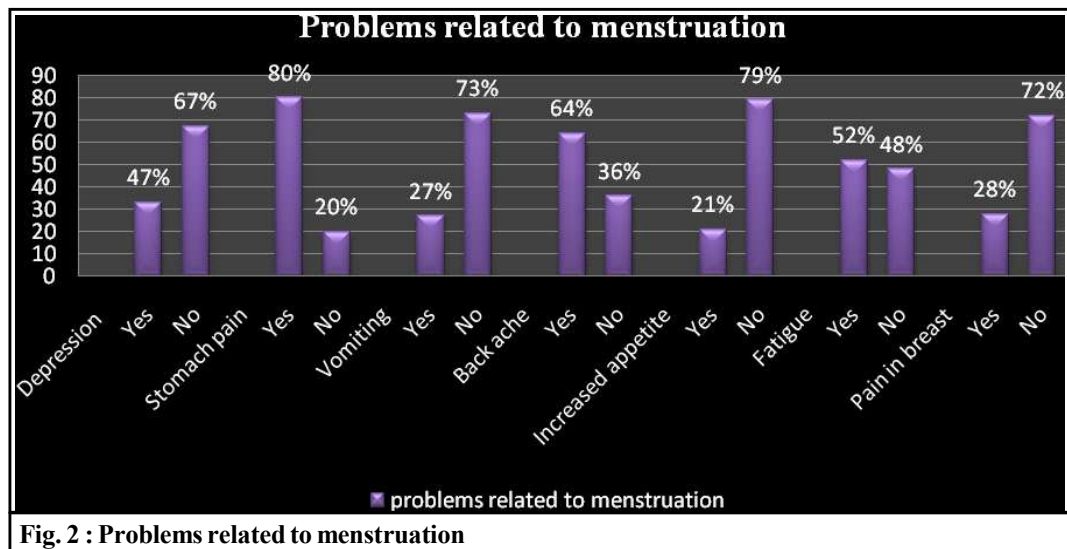


Fig. 2 : Problems related to menstruation

Dietary Habits :

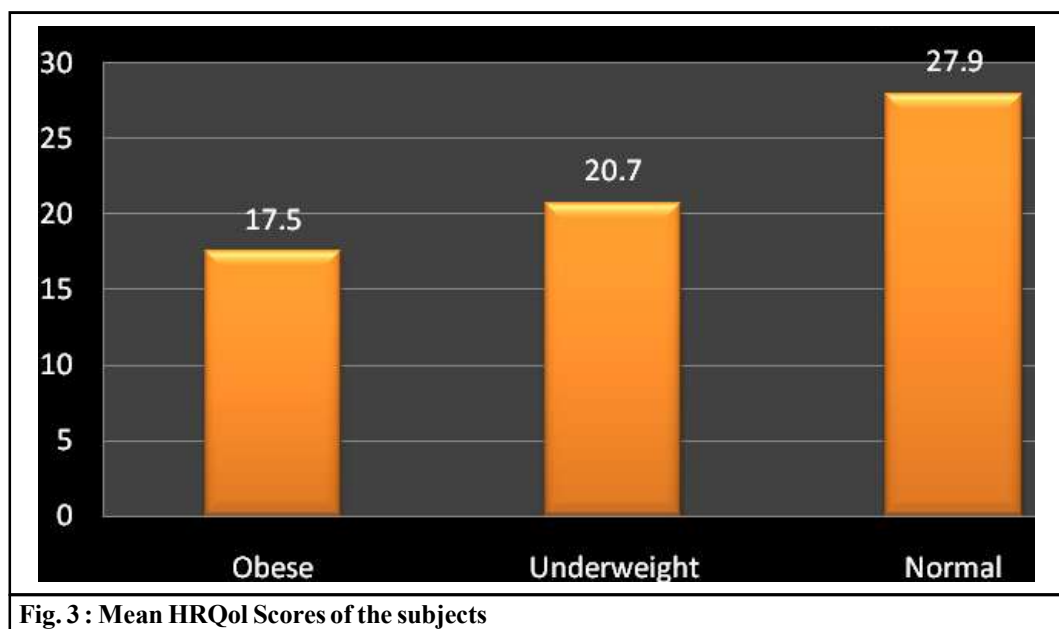
Majority (82 %) of the subjects follow non vegetarian diet. Skipping meals is often seen as an attractive way to lose weight. 56 per cent of the subjects had the habit of skipping their meals. Omission of breakfast or lunch was related to a clustering of less healthy life style factors and food choices leading to a poorer nutrient intake. Breakfast and lunch are the meals most often missed, but social, school and work activities can cause evening meals to be missed as well (Neumark *et al.*, 2000). 30 per cent of subjects skipped breakfast, 10 per cent skipped their lunch and 16 per cent were skipping their dinner due to reasons like busy schedule and due to fear of obesity. Dauchet (2009) revealed that the fast food and other meals away from home provide calories and protein but are usually low in nutrients such as vitamins, minerals and fiber. Drinking pattern of the subjects was not similar. About 16 per cent of subjects consumed more than 8 glasses.

Eating habits of adolescents are influenced by various physical and psycho-social factors. Only 7 per cent of the subjects suffer from anorexia nervosa, 6 per cent suffer from bulimia nervosa and 7 per cent suffer from binge eating disorder. Research suggests that binge eating results in an enlarged stomach capacity (Geliebter *et al.*, 2002), which could increase the likelihood of future binge eating through two mechanisms. Majority (77 %) of the subjects had the habit of eating in front of television and 23 per cent of subjects do not eat in front of television.

Assessment of health related quality of life (HRQOL) :

The health related quality of life of the subjects were assessed using KIDSCREEN – 10 Score. Ravens- Sieberer (2006) investigated that the KIDSCREEN generic health related quality of life measures for children and adolescents developed within the European project “Screening and Promotion for Health-related Quality of Life in Children and Adolescents -The KIDSCREEN-10 Index was developed from the longer KIDSCREEN-27. A Rasch analysis was applied to identify those items which represent a global unidimensional latent HRQoL trait. The results of the Rasch analysis provide a unidimensional index with 10 items. The psychometric properties of this index are that the distribution of raw-scores resembles the theoretical expected normal distribution, thus

the index provides a good discriminatory power and enables a precise and stable HRQOL measurement.



An analysis of the mean HRQoL score was performed and associated with the body mass indices of the subjects. The maximum score was obtained by subjects with ideal BMI, followed by underweight and finally obese subjects. As per the KIDSCREEN INDEX the subjects with maximum score corresponds to higher Quality of life. Hence it can be concluded that subjects with ideal BMI enjoy higher health related quality of life.

Conclusion :

Evidence suggests that obese children and adolescents reported poorer overall HRQoL compared to their lean counterparts (Tsiros *et al.*, 2009). In fact, one recent study found serious adverse consequences of overweight on health-related quality of life (HRQOL) in a clinical sample of severely overweight (BMI: 34.7) children and adolescents 5 to 15 years of age (Schwimmer, 2003). Only 37% of the respondents had BMI within the normal range and 47% had their waist hip ratio above 0.85. Majority of samples prefers junk and unhealthy foods than healthy and nutritious food. The health related quality of life of the subjects were analysed using Kidscreen score and analysis of mean scores revealed the association between the BMI and HRQoL among the adolescents. The results showed that respondents within the ideal BMI obtained higher scores and corresponded to a higher level of health related quality of life and their obese counterparts obtained the minimum mean score.

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