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Original Research Article

A Case Control Study Assessing the Association between Quality of Life of 6 to 12-Year-Old Children with Obesity

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Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to evaluate the quality of life among 6 to 12-year-old children with overweight and obesity in comparison to children with normal weight.

Methods: This case-control study was conducted on children referred for the routine pediatric check-up. The life quality of 6 to 12-year-old children with overweight and obesity were compared with that of a control group (children with normal weight). 150 children were included based on the clinical and paraclinical findings as well as inclusion and exclusion criteria (100 in overweight/obesity and 50 in normal weight). Eligible cases were enrolled, after obtaining informed consent.

Results: There was no significant difference in terms of gender and age between the two groups of children ($p>0.05$). The results showed that the average physical (32.48 ± 7.09 vs. 31.29 ± 5.75, $P=0.028$) and emotional (20.28 ± 3.77 vs. 18.02 ± 4.06, $P=0.042$) performances in the group of normal weight children was significantly higher than those of the overweight/obese children ($p<0.05$). However, the total score of life quality did not differ significantly between the two groups ($P=0.282$). The results showed that the average daily consumption of high-fat yogurt and liquid oil in the group of overweight/obese children was significantly higher than that of children with normal weight. Also, the average daily consumption of low-fat yogurt and vegetables in the group of children with normal weight was significantly higher than that of overweight/obese children.

Conclusion: The results of this study revealed that, in comparison to normal weight children, overweight and obese children scored lower in physical, academic, and mental performance; however, the total score of life quality was not significantly different between the two groups.

Keywords: Children, Obesity, Overweight, Quality of life.

Introduction

The prevalence of overweight and obesity in children and adolescents has risen in both developed and developing countries in recent decades. [1] Overweight and obesity are reported to be associated with an increased risk of development of hypertension, coronary arteriosclerosis, elevated cholesterol, type 2 diabetes, joint problems, stroke, and certain types of cancers. [2] Health consequences of overweight and obesity are not just limited to physical health; overweight and obese children experience problems including body dissatisfaction, negative body image, low self-esteem, depression, stigmatization and social marginalization which can influence their psychological and social health issues. [3] For children, overweight is defined as a body mass index (BMI) at or above the 85th percentile and lower than the 95th percentile of the same age and sex while obesity is defined as a BMI at or above the 95th percentile of the same age and sex. [4,5] Obesity is the result of caloric imbalance and is affected by various genetic, behavioral, and environmental factors. Behavioral factors include unhealthy eating habits and dietary pattern, sedentary lifestyle and lack of physical activity.

Moreover, the environmental factors (parents, peer, school and community) can per se influence children's dietary intake and physical activity and consequently their weight status. [6] In a small number of cases, childhood obesity is due to genes such as leptin deficiency or medical causes such as

hypothyroidism and growth hormone deficiency or side effects due to drugs (e.g. steroids). [7] WHO, defines quality of life 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, expectations, standards and concerns”, in other words, a global view that considers many dimensions of the human beings. [8]

In addition to increased co-morbidity, psychosocial limitations play an important role in the lives of these children. [9] Also they display significantly lower Quality of Life (QOL) than normal weight children of similar ages. [10-13] Quality of life (QOL) can be defined as a multidimensional construct that reflects one’s self-perceptions of enjoyment and satisfaction with life. [14] Assessing childhood QOL can provide insights into a child’s self-rating of physical, social, emotional, and school functioning [10,16] but most QOL researches with children have been conducted with individuals experiencing weight related distress significant enough to seek treatment. [15]

The aim of the present study was to evaluate the quality of life among 6 to 12-year-old children with overweight and obesity in comparison to children with normal weight.

Materials and Methods

This case-control study was conducted on children referred to the Department of Pediatrics, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India for one year the routine pediatric check-up. The life quality of 6 to 12-year-old children with overweight and obesity were compared with that of a control group (children with normal weight).

150 children were included based on the clinical and Para clinical findings as well as inclusion and exclusion criteria (100 in overweight/obesity and 50 in normal weight). Eligible cases were enrolled, after obtaining informed consent.

Inclusion and Exclusion Criteria

Inclusion criteria consisted of 6 to 12-year-old children referred to the Pediatric Department for check-up, signed a consent form to participate in the study (patients and their family) and were in the age group of 6-12 years. Exclusion criteria consisted of cases having genetic and mental illnesses that cause obesity, taking drugs that affect weight, acute or underlying diseases and in total having any physical, medical, psychological, learning, and/or behavioral disorders that could impede their participation, being in the age ranges of less than 6 or greater than 12 years. We also excluded patients who were dissatisfied to continue participation in study and those with incomplete data.

Data Collection

Data collection was based on an assessment protocol for gathering data on sociodemographic, clinical, and quality of life variables. Trained staff conducted the anthropometric measurements based on standardized methods. All anthropometric measurements were taken twice to obtain the exact value for accurate analysis. Children’ body weight and height were taken without shoes with light clothing by the use of a portable stadiometer to an accuracy of 0.1 cm while facing forward, standing in erect position, with Frankfort horizontal head position and bare feet without a hat or a hairstyle that could distort the measurement process [17] and body weight on a calibrated digital scale (Seca 767, Japan) with a precision of 0.1 kg. Body-Mass Index (BMI) was calculated as weight (Kg) divided by the squared height (m2). BMI status was determined using sex- and age-specific cut-offs for normal weight (≥10th percentile to ≤85th percentile), overweight (>85th percentile) and obesity (>95th percentile) based on Nelson Textbook of Pediatrics. [18]

For evaluating daily food consumption (nutrition pattern) according to the reports of the parents, a 24-hour dietary recall (24HR) was used which is a structured interview intended to capture detailed information about all dietary supplements and foods consumed by the respondent during the last 24 hours. A key feature of the 24HR is that, when appropriate, the respondent is asked for more detailed information than first reported.

The Pediatric Quality of Life Inventory (PedsQL)

The original version of the PedsQL quality of life questionnaire is a 23-item instrument that measures children's quality of life in 4 subscales: physical functioning (8 items), emotional functioning (5 items), social functioning (5 items) and school functioning (5 items). [19] The validation of this questionnaire in Iran has been done by Mohammadian et al[20] who obtained a content validity index (CVI) of 0.84 and a reliability index (Cronbach's alpha coefficient) of 0.82, which indicate the appropriate psychometrics of this instrument.

Respondents indicate the frequency of adoption of each of the 23 quality of life items based on a five-point Likert scale (never, rarely, sometimes, often, and always). The total PedsQL score is obtained by averaging the total responses to 23 items. In addition, the individual's score varies based on each sub-test, which was added together and estimated independently. Obtaining higher scores indicates that children have a better quality of life. [20]

Data Analysis

The data was statistically analyzed using SPSS version 22 software (SPSS Inc., Chicago, IL, USA). To compare qualitative characteristics between groups, Chi-square test was performed. Kolmogorov-Smirnov test was applied to assess the normal distribution of all quantitative parameters evaluated. For variables with normal distribution, Student t-test, and for variables with non-normal distribution, Mann-Whitney U-test was used. A p-value of less than 0.05 was judged significant.

Results

Table 1: Sample Characteristics and quality of life in overweight/obese and normal weight children

Variables		Overweight/obese	Normal weight	P-value
Gender (male)		40 (40)	25 (50)	0.692
Age (year)		8.52 ± 1.96	9.31 ± 1.85	0.392
PedsQL	Physical	31.29 ± 5.75	32.48 ± 7.09	0.028
	Emotional	18.02 ± 4.06	20.28 ± 3.77	0.042
	Social	22.08 ± 3.9	21.69 ± 5.08	0.064
	Academic	20.5 ± 2.88	21.29 ± 4.56	0.472
	Quality of life (total score)	93.07 ± 12.88	94.86 ± 17.53	0.262

There was no significant difference in terms of gender and age between the two groups of children (p>0.05). The results showed that the average physical (32.48 ± 7.09 vs. 31.29 ± 5.75, P=0.028) and emotional (20.28 ± 3.77 vs. 18.02 ± 4.06, P=0.042) performances in the group of normal weight children was significantly higher than those of the overweight/obese children (p<0.05). However, the total score of life quality did not differ significantly between the two groups (P=0.282).

Table 2: Comparing daily food consumption (nutrition pattern) between overweight/obese and normal weight children

Variables	Overweight/obese	Normal weight	P-value
low-fat milk	0.55 ± 0.82	0.67 ± 0.62	0.390
full fat milk	1.04 ± 1.2	0.78 ± 0.92	0.144
low-fat cheese	0.76 ± 1.24	1.07 ± 1.03	0.112
high-fat cheese	1.13 ± 1.67	0.77 ± 1.03	0.17
Low-fat yogurt	0.48 ± 0.62	0.8 ± 0.92	0.012
Full fat yogurt	0.88 ± 0.72	0.54 ± 0.76	0.007
White meat	2.78 ± 2.62	3.06 ± 1.4	0.404
Red Meat	2.24 ± 1.96	2.26 ± 1.34	0.923
Fruit	3.4 ± 1.66	3.46 ± 1.34	0.738
Vegetable	0.48 ± 0.52	1.12 ± 1.8	<0.001
bread and cereals	3.72 ± 2.14	3.54 ± 1.6	0.512
Liquid oil	2.56 ± 1.42	1.8 ± 1.12	<0.001
Solid oil	0.82 ± 1.08	0.96 ± 1.04	0.432
Sweets	3.14 ± 1.76	2.66 ± 1.34	0.382

The results showed that the average daily consumption of high-fat yogurt and liquid oil in the group of overweight/obese children was significantly higher than that of children with normal weight. Also, the average daily consumption of low-fat yogurt and vegetables in the group of children with normal weight was significantly higher than that of overweight/obese children.

Discussion

During the last four decades, the global prevalence of children with overweight and obesity has increased considerably [21]; the prevalence of overweight and obesity among children is reported to be 5.9% and 5% worldwide. [22] According to a 2005 study, there are currently 937 million (23.2%) and 396 million (24.0%) cases of overweight and obesity worldwide, respectively. By 2030, these numbers are projected to rise to 1.35 billion and 573 million, respectively, however less attention has been paid to childhood obesity. [23] Childhood obesity may cause problems, such as blood lipid disorders, high blood pressure, an increased tendency to develop blood clots, chronic inflammation, endothelial dysfunction, and increased blood insulin levels. [24] Consequently, a child's health risks increase with their level of obesity. [25]

There was no significant difference in terms of gender and age between the two groups of children (p>0.05). The results showed that the average physical (32.48 ± 7.09 vs. 31.29 ± 5.75, P=0.028) and emotional (20.28 ± 3.77 vs. 18.02 ± 4.06,

P=0.042) performances in the group of normal weight children was significantly higher than those of the overweight/obese children ($p<0.05$). However, the total score of life quality did not differ significantly between the two groups (P=0.282). The results showed that the average daily consumption of high-fat yogurt and liquid oil in the group of overweight/obese children was significantly higher than that of children with normal weight. Also, the average daily consumption of low-fat yogurt and vegetables in the group of children with normal weight was significantly higher than that of overweight/obese children. One of the most important issues raised in relation to obesity is its relationship with lifestyle, which is closely related to quality of life. [26] Previous studies have shown that overweight/obese children's quality of life is significantly different from that of normal weight children. [27]

In contrast, Beharizadeh et al [28] showed that all aspects of the quality of life in children suffering from overweight and obesity were significantly lower in comparison to control children. Similar results have been obtained in case of obese children aged 5 to 16 compared to the non-obese control group.[29,30] In this study, we found that the average physical and mental performances in the group of normal weight children were significantly higher (better) than those of the overweight/obese children. The reason for the relationship between obesity and physical activity can be the fact that as a child's weight increases, his ability for physical activity decreases, and it leads to a decrease in energy demand and activity of skeletal muscles, as well as a decrease in fat oxidation in body tissues. As a result, it is accompanied by weight gain and causes an increase in obesity in these children. [29] Similar to the present study, Beharizadeh et al28 reported that the psychological performance score in overweight and obese children was significantly lower compared to the non-obese control group. A similar result was also reported in a study conducted in London on obese children and adolescents aged 5 to 16 years compared to a non-obese control group. [30]

Moreover, we found that the average daily consumption of high-fat yogurt and liquid oil in the group of overweight/obese children was significantly higher than that of children with normal weight. Also, the average daily consumption of low-fat yogurt and vegetables in the group of children with normal weight was significantly higher in comparison to overweight/obese children. Investigating the consumption of different food groups, Fadakar [31] reported that lack of fruits consumption, vegetables, and breakfast along with consumption of chocolate, fast food and beans had a statistically significant relationship with obesity. The results of another study conducted by Karimi et al [32] indicated that only 17.4% of the cases with overweight and obesity always consumed vegetables and 34.1% consumed fruits.

Conclusion

The results of this study revealed that, in comparison to normal weight children, overweight and obese children scored lower in physical, academic, and mental performance; however, the total score of life quality was not significantly different between the two groups. However, due to the lack of difference between the social performance score of these children and that of the normal weight children, it can be concluded that by proper treatments, we can prevent possible future injuries.

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