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RESEARCH ARTICLE

OVER WEIGHT, OBESITY AND AWARENESS OF LONG TERM RISKS AMONG TWO HIGH SCHOOLS IN KHARTOUM STATE, SUDAN

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ABSTRACT

Background: During the last 2 decades overweight and obesity have increased globally among children and adolescents**.**
Methods: This was a descriptive, cross sectional study conducted during the period October 2012 to January 2013 among two high schools in Khartoum state. A total of 425 students from both schools were included in the study. Data was collected using a questionnaire, stadiometer and a measuring scale and body mass index was calculated. Data analysis was performed using SPSS program. P value was set on at 0.05 level of significance.
Results: The results revealed that nearly one fourth of high school girls were overweight/obese, with the proportion slightly higher in the private school, also most of the students consider obesity a risk factor for hypertension, heart disease and breathing problems. Most of the girls in our study indicated a clear desire to lose weight.
Conclusion: Public health programs are needed to increase awareness on risk factors for overweight and obesity among children and adolescents in order to reduce the future burden of obesity-associated chronic diseases.

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INTRODUCTION

The proportion of children in the general population who are overweight and obese has doubled over the past two decades in both developed and developing countries (Bundred *et al*, 2001;Ogden *et al* 2002). Contributory factors include sedentary behaviour, lack of physical activity, excessive fat intake, frequent intake of fast-food and sugar sweetened beverages (Hills *et al*, 2010;Rennie *et al* 2005).Overweight youth are at risk of being obese during adulthood(Singh *et al*, 2008) putting them at greater risk for heart disease, type 2 diabetes, stroke, cancer, osteoarthritis and early mortality (NHLBI, 2012).Additionally, overweight and obesity affect self-esteem of children and impair social development (Friedlander *et al*, 2003). Low and middle income countries are now facing a double burden of nutritional problems where obesity and under nutrition tend to coexist. Children in low and middle income countries are vulnerable to inadequate nutrition; at the same time, they are exposed to high fat, sugar, salt, energy dense foods. These dietary patterns in conjunction with lower levels of physical activity result in sharp increase in childhood obesity while under nutrition issues remain unsolved (Popkin and Slining, 2013). The main objectives of this research were to determine the prevalence of overweightand obesity among two high schools in Khartoum state, to identify the awareness of health risks associated with obesity and to determine the desire to lose weight among teens.

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MATERIALS AND METHODS

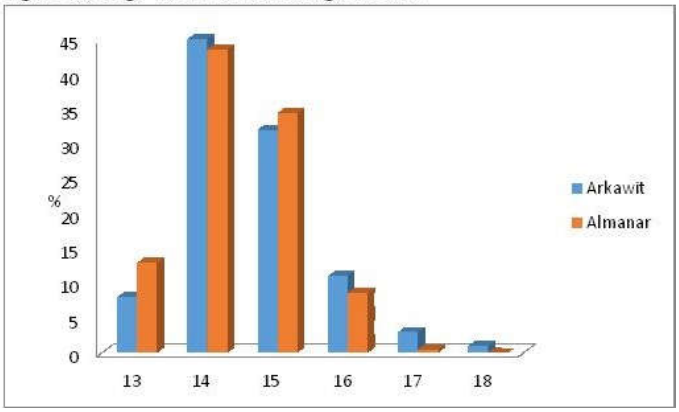
This was a descriptive, comparative, cross sectional community based study conducted during the period October 2012 to January 2013. The study was conducted among two female high schools in Khartoum state, one is private (Almanar) and the other one is public (Arkawit). Students between 13-18 years of age were recruited to participate in the study.225 female students from Almanar private school and 200 female students from Arkawit public school were included in the study. The sampling method was systematic sampling by using the list of students. The tools used for data collection included a questionnaire, stadiometer and a measuring scale.

The questionnaire contained information like age, family income, eating habits and awareness of risks. Height was measured by stadiometer to the nearest centimeter without shoes. Weight was measured with light clothing and without shoes to the nearest 100 grams. Body mass index(BMI) was calculated by using: BMI= weight in kg / (height in meters)^2.After BMI is calculated for children and teens, the BMI number is plotted on the BMI for age and sex growth charts, normal weight (5%-85%),overweight (85%-95%) and obese >95%. Also a pilot study was conducted to determine validation, content and face validity. Data analysis was performed using Statistical Package for Social Sciences (SPSS) program version 18.Statistical analysis was divided into two: Descriptive statistics, including frequency, percentage, mean, and standard deviation to analyze personal factors (age, family income, etc...) and inferential statistics calculating T test. P value was set on at 0.05 level of significance. Ethical clearance to perform this research was obtained from the ethical committee of the University Medical Sciences and Technology and school administration. Prior informed consent was obtained from the subjects and their respective guardians.

RESULTS

225 students from Almanar private school and 200 students from Arkawit public school were included in the study. The age distribution was almost similar in the two schools and most of the students were lying between 14 and 15 years of age (Figure 1). The results showed that 54 % of the students in Almanar school and 45 % in Arkawit had normal weight, whereas 21 % of Almanar and 16 % of Arkawit were overweight. 6% of Almanar and 5% of Arkawit were obese Figure (2). The results revealed that there was statistically significant difference in the BMI between the two schools (Table 1).

Figure (1): Age distribution among students:



When comparing the family monthly income between the two schools, most of the families in Almanar school had an income more than 4000 SDG (Sudanese pound) whereas in Arkawit it was between 500 -1000 SDG. At the time of the study 1 US dollar was equal to 6 SDG (Figure 3). Regarding family history of obesity, in Almanar School 37% of students have family history of obesity while in Arkawit 46% have family history of obesity. 54% of Arkawit's girls practice physical exercise compared to 58% of Almanar's girls. The commonest type of

Figure (2) Distributions of BMI growth charts percentiles among students

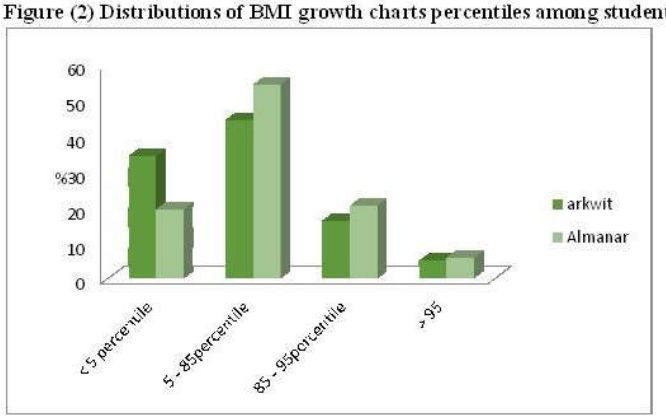
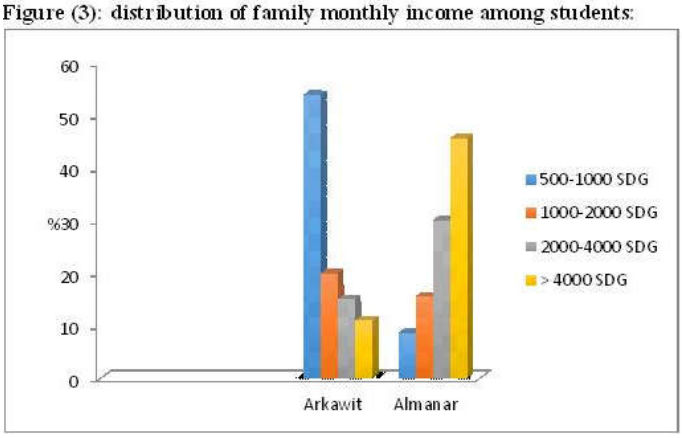


Table 1. Comparison of body mass index between Almanar School and Arkawit School using T-test as statistical test

School	Mean	Standard deviation	P-value
Arkawit	20.8040	4.20	0.016
Almanar	22.0780	4.28	0.016

Figure (3): distribution of family monthly income among students:



physical exercise practiced in Almanar school is walking while running is mostly practiced in Arkawit school. When inquiring about the desire to lose weight, 70% of Almanar's girls have desire to lose weight while 45% of Arkawit have the desire to lose weight. When comparing the awareness of obesity risks among the two schools, the awareness was the same in the two schools regarding obesity as a risk factor for heart disease (87%). Also 65%of Almanar students and 68 % of Arkawit students consider obesity as a risk factor for hypertension. When inquiring about obesity as a risk factor for cancer, the awareness was low in both schools, 41 % of Almanar students and 47% of Arkawit students consider it as a risk factor while 31 % and 22 % from Almanar and Arkawit don't know whether it is risk factor or not and 28 % and 31 % of Almanar and Arkwit don't consider obesity as a risk factor for cancer. Most of the students in both schools (79%) consider obesity as a risk factor for breathing problems while 14% from Almanar and15% from Arkawit don't consider it as a risk factor. Regarding the psychological effects of obesity, 87% of Almanar students and 78% of Arkawit students think that obesity is a risk factor for social and psychological problems while 7% of Almanar and 16% Arkawit students don't think so. 58% of Almanar students and 54% of Arkawit students consider obesity as a risk factor for joints problems.

DISCUSSION

Childhood obesity is a global public health challenge and its health consequences are well documented (Lobstein *et al*., 2004).This comparative, cross sectional study showed that nearly one fourth of high school girls were overweight/obese, with the proportion slightly higher in the private school. This finding is in line with results of other studies (Ramachandran *et al*., 2002; Khadilkar *et al*., 2012), however previous studies reported a large variation in theprevalence of childhood overweight and obesity ranging from 2.9 to 44.4 % across various countries (Stamatakis *et al*., 2009; Thibault *et al*., 2012). This difference could be due to differences in local dietary, life-style habits and socioeconomic factors. The present study clearly demonstrated higher prevalence of overweight/obesity in the private school as compared to the government school. This is compatible with other similar studies in different region of the globe (Jagadesan *et al*., 2014; Anteneh *et al*., 2015), this might be because students in private schools usually come from families with higher socioeconomic groups which in turn might be exposed to high energy dense foods. In addition, a student from high economic classes usually uses vehicles for transportation. However, even among the government school, the prevalence of overweight/obesity is significant. This new trend can be attributed to easy access and low price of both junk foods and sugar rich drinks resulting in an increased consumption of energy-dense foods coupled with decreased physical activity in the lower income group (Mahshid *et al*., 2005).

Our study revealed that 54% of Arkawit's girls and 58% of Almanar's girls practice physical exercise, this is much lower that the study conducted in six schools in Malaysia where the prevalence of active physical exercise was 79.2% (Aniza and Fairuz 2009). This difference could be explained by the fact that, the girls in our study claimed that there were no suitable places for girls to practice physical exercise, in addition to personal barriers, family and peers support and burden of homework. Physical activity is important since it is the first lineof prevention especially at a very early age to prevent chronic diseases in adulthood. Physical activity remains the most important modifiable risk factors in preventing many diseases, especially of chronicorigin (CDC, 1996). Our data indicated that most of the students have the desire to lose weight. Adolescence is a time of high nutritional requirements; nonetheless dieting by teenage girls in an effort to control body weight is well documented and obesity phobia is so pervasive among female adolescents that it has been described as 'a normative discontent'(Hill *et al*., 1992; Wadden *et al*., 1989). Most of the students in this research reported that they recognized obesity as a problem with long term consequences, in contrast to a study conducted in 2000, in which youth were indifferent to the topic (Borra *et al*., 2003).This difference could be attributed to low familiarity with or perceived severity of the long-term health consequences of obesity and differences in beliefs and behavior among adolescents. In a study done in Germany, nearly 90% of the enrolled students agreed that overweight/obesity increases the risk for other diseases (Pantenburg *et al*., 2012), however this study was confounded by the fact that all participants were medical students.

Conclusion

High prevalence rates of overweight and obesity were found among high school girls in Khartoum state. Most of the students consider obesity a risk factor for hypertension, heart disease and breathing problems. Public health programs are needed to increase awareness on risk factors for overweight and obesity among children and adolescents in order to reduce the future burden of obesity-associated chronic diseases.

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