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Assessment of Prevalence and Factors Associated with Obesity among Secondary School Students at Makkah in Saudi Arabia 2021

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ABSTRACT

Background

The prevalence of overweight/obesity in children in Saudi Arabia is among the highest in the world. The prevalence of dental caries is also high in Saudi children. Studies on the relationship between caries and obesity in Saudi adolescents are lacking. the World Health Organization (WHO) defines obesity as “abnormal or excessive fat accumulation that may impair health,” while overweight is defined as “a body mass index (BMI) of 25 kg/m2 or more.”1 Overweight and obesity can negatively affect the physiological and psychological well-being of the affected individual, and both have become a global The prevalence of overweight/obesity in high school adolescents. The Overweight and impaired metabolic health might strongly, and independently of other comorbidities, partner with expanded danger diseases .

The study aimed: To assessment of prevalence and factors associated with obesity among secondary school students at Makkah in Saudi Arabia 2021 .

Method: An online cross-sectional survey was utilized Secondary school students at in Makkah Al-Mukarramah in Saudi Arabia 2021 during the April to June, 2021, a total of 200 student aged 12–18 years, available students of secondary school children were included in the study. A structured online self-reported questionnaire sheet was used To assessment of prevalence and factors associated with obesity among secondary school students at Makkah in Saudi Arabia 2021

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Result: show the total number of participants was 200 regarding the age most participants were classified into 3 age groups, most of them were (45.0%) in the more than 16 years regarding gender of participated female were (63.0%). Regarding Income level in study the most of participant's Below 5000 SR were (31.0%). Regarding Educational level in study the most of participant's Intermediate school were (22.0%) regarding Sources of information about obesity most of participant's educational films were (32.0%)

Conclusion: with a high obesity prevalence in boys and in children attending schools. The prevalence was not associated with BMI or WC we report a negative independent association between BMI and subsequent academic performance among female high-school students in Saudi Arabia. The current findings highlight the need for community and school programmes targeting overweight/obesity among high school students

Keywords: assessment, prevalence, factors, associated, obesity, secondary, school, students Saudi Arabia, Makkah**.**

Introduction

Over the last few decades, there has been a worldwide increase in childhood obesity affecting developed and developing countries (1). In the Saudi Arabia, the prevalence of obesity among adolescents aged 12–19 years increased from 5% in 1980 to nearly 21% in 2012 (2,3). In Saudi Arabia, several local and national reports have shown a similar problem, with the prevalence of overweight and obesity among adolescent children ranging between 30% and 46% (4-5). As childhood obesity is likely to continue into adulthood, it puts the affected children at higher risk of obesity-related disorders such as diabetes and cardiovascular, respiratory, gastrointestinal and or the obesity diseases at a younger age (6). Additionally, childhood obesity and associated distorted perception of body image can have a serious negative impact on child psychology, self-esteem and quality of life (7–8)The prevalence of Obesity is common in KSA, so there is a need to explore' awareness of Obesity in the primary care physicians in Makkah toward management of Obesity. So that policymakers can devise policies to educate the young generation (9)

The prevalence of Obesity in various regions has attracted significant attention of the medical experts. also thereby increasing disease the prevalence of diabetes and Obesity is expected to increase in the future due to changes in lifestyle and unhealthy diets of individuals in KSA(10) More than two-thirds (70%) of patients with diabetes mellitus (DM)and Obesity reside in lower middle-income countries (11) In the medical services space, the most multiplied illness perceived over the world is obesity. This is obvious from the expanded revealing of obesity illness which is relied upon to arrive at a figure of 350 million and expected to turn into the driving reason for death by 2030 (12)

obesity is a major disease burden in KSA, and we are home to the second largest number of diabetes cases in the world (13) In 2017, With changing lifestyles the prevalence of obesity and diabetes mellitus (DM) has been rising worldwide over the past few decades. According to a recent estimate by the International Diabetes Federation, the age-adjusted prevalence of diabetes in Saudi Arabia is 17.7 (14)Obesity can be defined simply as the disease in which excess body fat has accumulated to such an extent that health may be adversely affected. World Health Organization (WHO) reported that obesity is one of the most common and also the most neglected, public health problems in both developed and developing countries.

Obesity is strongly associated with other metabolic disorders, including diabetes, hypertension, dyslipidemia, cardiovascular disease even some cancers.(15) Overweight and obesity also increases the likelihoods of suboptimal glycaemic control making it difficult to achieve glycaemic targets.(16)

In the past three decades, despite considerable advances in treatment modalities of In the past three decades, despite considerable advances in treatment modalities of In the past three decades, despite considerable advances in treatment modalities of diabetes, it has been shown considerable gaps between patients 'outcome and acceptable treatment in developed and also in developing countries. Different reasons are proposed in failure to achieve therapeutic goals such as poor adherence to treatment regimens by patients or malpractice by physicians(17)

Literature Review

The results of one study in the US showed that physicians' knowledge in the treatment of Obesity was not enough and knowledge level of different medical groups such as general practitioners, specialists, internal medicine residents and medical students had significant differences with each other(18-19)

Several studies have examined the association between overweight/ obesity and academic performance among students at different grades of elementary education, with conflicting findings. For example, several studies reported reduced academic performance in obese children (20), while other studies among primary school students failed to detect such an association(12). Additionally, gender-specific variability in the relationship between overweight/obesity and academic performance has been reported. Obese girls had lower academic achievement compared with those of a healthy weight. However, such an association was less clear in boys (22). In Chinese adolescents, overweight perception was related to lower GPA in girls only (23).There is a poor understanding of the underlying mechanisms (24). Despite the high prevalence of childhood/adolescent obesity and the importance of academic performance of high-school students in shaping their future education (25), there has been a lack of studies of the association between overweight/obesity and academic performance among Saudi Arabian students. The objective of the current study was to assessment of prevalence and factors associated with obesity among secondary school students at Makkah in Saudi Arabia 2021 .

In Aseer region, Al-shahrani and Al-khaldi (2013) estimated the prevalence of obesity among 14,252 diabetic patients attended PHC centers . The prevalence of obesity among diabetic patients was 46%. About half of the diabetics had poor diabetic control, with significant association with obesity (24)

Rationale:

Overweight and obesity in secondary school are serious public health issues, both in developing and developed countries. The present study aimed to ascertain overweight and obesity prevalence rates among schoolchildren in , and their correlation with physical activity, socio-economic conditions and eating habits. With the changes in major lifestyles, the prevalence of obesity is increasing among secondary school students therefore, this issue implicated to complicate the outcome, well -being and productivity. Improved quality of life has been regarded as a key goal of all healthcare interventions including a special interest in

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obesity and its related complication, particularly in type II diabetic patient's obesity and affected to diabetes mellitus management. Up to the researcher's knowledge the prevalence of obesity is increasing; therefore.

The study aimed

To assessment of prevalence and factors associated with obesity among secondary school students at Makkah in Saudi Arabia 2021.

Methodology

Study design:

Cross-sectional design in the present study

Study area and population:

Students obesity in the secondary school students who registered in primary health care center and schools in Makkah

Inclusion criteria

- Students obesity.
- Both males and females.

Sample size:

Sample size was calculator by Raosoft Online sample size calculator ،It was 200 Students obesity, based on assumption that during the last 4 weeks, the total number of diabetic patients who visited the primary health care center or schools in Makkah 200 patients, prevalence was considered as 50%, confidence level was 95%, margin of error was 5%. By adding 10% for defaulter and non-respondent, 200 students were invited to participate in the study.

Sampling technique

Systematic sampling technique was used. Approximately 20 patients visit the PHC center daily. Ten student were selected daily by choosing every other student . Thus, nearly 14 working days were needed to collect the sample

Data collection tool

Self-administrated questionnaire was used for data collection. It was adopted from a previous Saudi study. Some modifications were done and the new format was validated by three consultants (family medicine, Endocrinology and community medicine). The final draft of the questionnaire consists of two sections:

-First section: Includes socio-demographic and personal characteristics of the participants.

-Second section: Includes associated factors with obesity (physical exercise, diet habit. Additionally, the body mass index (BMI) was calculated by an expert nurse.

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Data Collection technique

- During the study period (April to June, 20212021), the researcher was available at the involved conducted secondary school students
- The researcher distributed the questionnaire in the waiting area by themself to the selected student.
- The questionnaires were collected at the same time.

Data entry and analysis

Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS version 24). Categorical variables were presented as frequency and percentage whereas continuous variables were presented as mean and standard deviation (±SD).
Statistical significance was determined at $p<0.05$ for all comparisons.

Pilot study/pretesting

A pilot study was conducted on 20 patients, representing approximately 10% of the sample size. It was done in another school students at Makkah, rather than those involved in the study to test the clarity of the questions and feasibility of the methodology. No modifications were made according to the pilot results.

Ethical considerations

Research committee approval ,Written permission from the joint program of family medicine in Makkah Al-Mukarramah,Written permission from concerned school authority in Makkah Al-Mukarramah , Individual verbal consent from all participants before data collection , Acknowledgments of all supervisors, advisors, helpers, facilitators and participants. All collected data were kept confidential.

Budget: Self-funded

Results

Table 1. Distribution of Socio-demographic characteristics of the studied participated (Age, Gender, Marital status, Level of education)(n-200)

	N	%
Age		
<14	62	31
14-16	48	24
More than 16	90	45
Sex		
Male	74	37
Female	126	63
Income level		
Below 5000 SR	62	31
5000 – 10000 SR	48	24

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10,000 – 20,000 SR	40	20
Above 20,000 SR	50	25
Educational level		
Intermediate school	132	66
Secondary school	68	34
Sources of information about obesity		
Booklets and brochures	62	31
Mass media	30	15
Own personal experience	44	22
Educational films	64	32

Table 1 show the total number of participants was 200 regarding the age most participants were classified into 3 age groups, most of them were (45.0%) in the more than 16 years regarding gender of participated female were (63.0%). Regarding Income level in study the most of participant's Below 5000 SR were (31.0%). Regarding Educational level in study the most of participant's Intermediate school were (22.0%) regarding Sources of information about obesity most of participant's educational films were (32.0%)

Table 2 Distribution of the habitual factors associated of the studied participated

	N	%
Do you have any complications from obesity?		
Yes	114	57
No	86	43
If you have any complication, please select it?		
Complication on foot	39	34.21
Complication on eye	25	21.93
Complication on kidney	31	27.19
Cardiovascular complication	11	9.65
Neuropathy	8	7.02

Table 2 show regarding do you have complications from obesity most of participants answer Yes (57.0%), follow by No were(43.0%) , regarding have any complication, please select it most of participant Complication on foot were(34.21%) follow by kidney complication were (27.19%).

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Figure 1 Distribution of the habitual factors associated of the studied participated

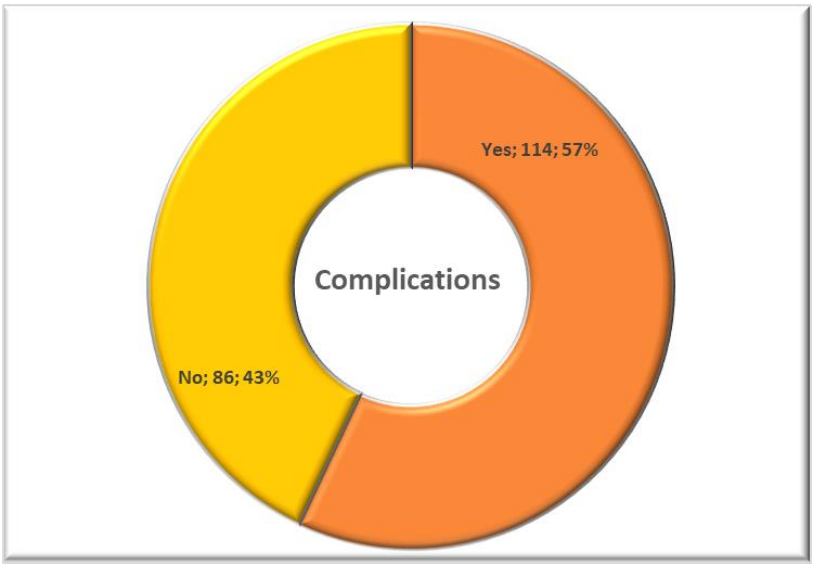

Figure 2 Distribution of the complications of the studied participated

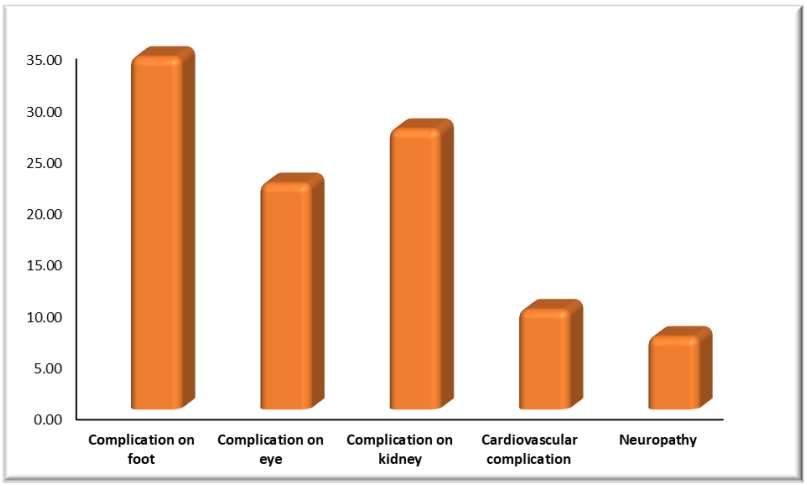

Table 3 Distribution of the habitual factors (Physical activities) associated of the studied participated

	N	%
Physical activities or exercises		
No	122	69
Yes	78	31
If yes What is type of physical activities or exercises		
Walking	38	48.72
Running	18	23.08

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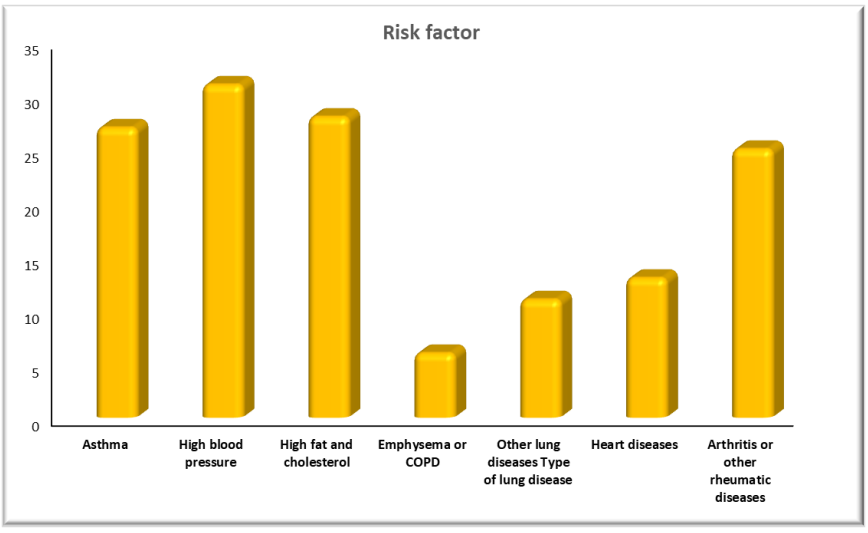
Both	22	28.21
Do you stop aerobic exercise for two consecutive days or more per week?		
Always	56	71.79
Sometimes	12	15.38
No	10	12.82
Risk factor		
Asthma	54	27
High blood pressure	62	31
High fat and cholesterol	56	28
Emphysema or COPD	12	6
Other lung diseases Type of lung disease	22	11
Heart diseases	26	13
Arthritis or other rheumatic diseases	50	25

Table 3 show more than half of the participants (69.0%) answer No practice Physical activities or exercise physical , regarding If yes What is type of physical activities or exercises the majority of the participants running were (48.72%), regarding you stop aerobic exercise for two consecutive days or more per week the majority of the participants always were (71.79%). Regarding Risk factor the majority of the participants High blood pressure were (31.0%).

Figure 3 Distribution of the risk factors associated of the studied participated



Discussion

Obesity and overweight are major public health problems among student, with significant health, demographic and socio-economic implications(26). Food environments have changed in past decades and obesity and overweight rates have increased dramatically in both

developing and developed countries(27). The present study To assessment of prevalence and factors associated with obesity among secondary school students at Makkah in Saudi Arabia 2021 . It also investigated the factors associated with overweight/obesity. The study established that overweight and obesity prevalence is high and linked with sedentary behaviour, poor eating habits and limited dietary diversity.

Overweight and obesity prevalence was lower than what has been reported in the literature( ). Although this prevalence was similar to that in other studies(28), it was higher than the rate among pre-school student participating in a cross-sectional study conducted in twenty-six African countries. Several others have shown that urban student, because of favourable environmental and socio-economic conditions, generally manifest better nutritional status than their rural counterparts(29). A similar study among rural student will be necessary to confirm or refute this hypothesis in KSA. The anther survey found higher prevalence rates of overweight and obesity in girls than in boys, which concurs with other reports from low- and middle-income countries, but the opposite held true in high-income countries where overweight and obesity rates were higher in boys than in girls(30). This observation might be related to cultural behaviours(31). Differences in physical activity and energy expenditure between boys and girls may also have contributed to the lower prevalence of overweight and obesity among boys. Differences in published data on prevalence may be explained by study design, population included and cut-offs defining overweight and obesity. Indeed, many cut-off values have been published; each method has its advantages and limitations, and should be used cautiously(32)

While overweight and obesity in student have definitely become a worldwide public health concern, malnutrition remains the greatest problem in developing countries(33). Given the fact that severe underweight is almost always a sign of malnutrition we can assume that malnutrition persists in KSA, even in urban areas. In addition, some overweight/obese children may be malnourished as well.

Conclusion

Obesity prevention campaigns are considered to be successful through changes in environments such as schools, especially if they occur early in life Thus, it is particularly relevant to identify the factors associated with overweight and obesity in secondary -school populations in the specific context settings in KSA country Findings on dietary diversity in the indicated that many schoolchildren had diets with little variety, as disclosed by the fact that one-third of them consumed fewer than four food groups daily . The most neglected food groups were dairy products, tubers, eggs, fruits, meats and vegetables, as reported in other investigations

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