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Lifestyle patterns associated with overweight and obesity among adults in Jabra Area in Khartoum State - Sudan: A community based study.

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Abstract

This is a descriptive cross - sectional community based study, with objectives to estimate the prevalence of and to identify the possible lifestyle factors associated with overweight and obesity among adults. Data were collected from 273 participants (99 males and 174 females) using structured questionnaire and anthropometric measurements of weight and high. The prevalence of overweight and obesity were 33.7% and 25.6% respectively. The results showed the overweight /or obesity were more prevalent among females with p value = 0.001, compared to males. The results showed there was statistical association between overweight /or obesity and eating pizza ≥ 3 T/W and using computer/or mobile ≥ 3 hours per day p values (0.043 and 0.002) respectively. Overweight /or obesity was found more prevalent among those not practiced physical activity 17.9% / 18.7% compared to those practice physical exercise 15.8% / 7% p value =0.021. The results showed there was negative association between overweight /or obesity and watching TV ≥ 3 hours per day, smoking and alcohol consumption (P value > 0.05).

Keywords: Overweight, obesity, BMI, lifestyle, prevalence, Khartoum, Sudan

Introduction

Globally, there is mounting concern about increases in overweight and obesity that have occurred during the last few decades [1]. According to a WHO report, obesity is defined as a body mass index (BMI) ≥30 kg/m^2, and overweight as a BMI of 25–29.9 kg/m^2 [2]. According to the World Health Organization (WHO), obesity has become a major problem of public health in both developed and developing countries [3]. The problem of obesity is increasing in the developing world with more than 115 million people suffering from obesity related problems. Obesity rates have increased 3-fold or more since 1980 in Middle East, the Pacific Islands, Australasia, and China [4, 5]. Overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese. 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 rates in Western Africa are estimated to be 10%. Rates of obesity among women are three times those found in men. In urban West Africa rates of obesity have more than doubled in the last 15 years [6]. Although a review of the modest published literature on this topic may point to a general positive association obesity in both and smoking cessation, alcohol consumption, family history of obesity, diabetes and hypertension [7]. In Latin America, the obesity epidemic has been associated with economic growth, rapid urbanization, and subsequent lifestyle changes, among them increased consumption of fat, sugar, and refined grains and reductions in daily physical activity [8]. A study showed Watching 3 or more hours of television daily and rating oneself as less active than others were associated with both overweight and obesity [1].

The prevalence of overweight and obesity in Africa different from country to other. In Zambia was 24.7% (21.0% among males and 27.3% among females) [9]. The prevalence of overweight and obesity among adults in Algeria was respectively 32.5% and 30.9% [10]. The prevalence of overweight and/or obesity in Ethiopia was found to be (9.4%) [11]. The crude prevalence of overweight and obesity among civil servants in Lagos, Nigeria was 70.7% [12].

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Overweight and obesity in Sudan
Several studies have indicated that, the prevalence of overweight and obesity in Sudan with increasing rates. A study conducted by Abu-Aisha et al, reported that the prevalence of overweight and obesity in police forces household in Khartoum was (45.8%) [13]. other study finding the overweight and obesity prevalence among adult Sudanese was 98% [14]. Another study showed the prevalence of overweight and obesity in Sudan was 30% and19.2% respectively [15]. The prevalence of overweight and obesity among Sudanese patients with type 2 diabetes mellitus was found to be 16.8% and 6.9% respectively [16].

Materials and Methods
Study design and population
It was a descriptive cross-sectional community based study included 273 adults from Jabra Area. They were selected by systematic random sampling.

Study setting: This study was conducted at Jabra area in Khartoum state -Sudan, it is urban area locate between Al-Sahafa area from East, Al-Shajrah area from West, Railway from South and military zone from North direction. The total population about 6000 person. There are two health centre (AL-Shaheed kalid and Ana-alsudan) and 4 government primary school and 2 Secondary school.

Data collection Methods
From (273) participant in this study determined using statistical equation ($n = Z^2 \times pq/e^2$). Where n is the sample size, Z^2 is the abscissa of the normal curve that cuts off an area α at the tails (1 - α equals the desired confidence level is 95%), e is the desired level of precision, p is the estimated proportion of an attribute that is present in the population, and q is 1-p [17]. Relevant data were collection used structured questionnaire to collect lifestyle characteristics such as (Meal per day, snacks, ready food patterns (eating pizza, burger, shawarma and fries), physical activity, watching TV, using computer/mobiles smoking and alcohol consumption) and anthropometric measurement of weight and height to calculate the BMI.

Anthropometric measures: Weight and height, measurements were taken. Heights of the subjects were measured with an inelastic measure tape, with the subject standing on bare feet. For weight measurements, the subjects were required to stand on electronic scale with bare feet as well. Then BMI was calculated as BMI = Weight (Kg) / [Height (m)^2]. According to the WHO classification of BMI. Less than 18.5 consider underweight, 18.5 – 24.9 normal weight, 25 – 29.9 overweigh and ≥30 obese.
The consent was obtained from each participant in this study and he/she was informed about the purpose of the study at first.

Data Analysis: Data were analyzed used SPSS (Statistical Package for Social Science) version 20. The P.value less than 0.05 considered statistically significant.

Results: Two hundred and seventy three (273) participants were enrolled in this study, 36.3% (99/273) of them were males while 63.7% (174/273) were females. The BMI indicators was more prevalence in females than males table, the results statistically significant (P=0.001) at x^2 16.5931. The prevalence of overweight and obesity was high among those eating three or less than three meals per day than those eating more than three meals 21.6, 9.9, 2.2% and 11.7, 11.6 and 2.9% respectively. The results also showed there is no statistical association between overweight and obesity in adults and snacks (p=0.170) at x^2 9.068. Regarding to the ready foods, the prevalence of obesity was high among those eating pizza more than three times per week than other ready foods (Shawarma, burger, and fries) 18.3% and 11%. 2.6% and 3.3% respectively. The results showed there was significant between overweight /or obesity and pizza (p=0.043) table3.
Table (4) shows the possible lifestyle characteristics of adults, from table the overweight and obesity was high among those not practiced compare to those practices physical exercise 17.9% -18.7% and15.8%-7% respectively the p value = 0.021, regarding to using computer/or mobile. According to analysis there was statistical significance between obesity and those using computer/or mobile more than 3hours per day (P=0.002). Also analysis showed there is no statistical association between overweight/or obesity and watching TV ≥ 3 hours per day, smoking and alcohol consumption (P > 0.05).

Table 1: Prevalence of overweight and obesity by sex according to Body Mass Index (BMI)

BMI Classification	Prevalence (%)			Prevalence Ratio	Chi-Square	P-Value
	Total	Males	Females	M/F		
Under weight (BMI <18.5)	07.7	2.9	4.8	0.60		
Normal (BMI 18.5- 24.9)	33.0	15.8	17.2	0.92		
Overweight (BMI 25-29.9)	33.7	13.2	20.5	0.64	16.593	0.001*
Obesity (BMI >30)	25.6	4.4	21.2	0.21		

Table 2: Relationship between of overweight and obesity and Meals per day and Snacks according to Body Mass Index (BMI)

Variable	BMI								Total		Chi-Square	P-Value
	Underweight		Normal		Overweight		Obesity					
	No	%	No	%	No	%	No	%	No	%		
Meal per day												
3 times	13	4.8	58	21.2	59	21.6	32	11.7	162	59.3		
< 3	5	1.8	23	8.4	27	9.9	30	11.0	85	31.2	9.068	0.170
>3	3	1.1	9	3.3	6	2.2	8	2.9	26	9.5		
Snacks												
Yes	6	2.2	39	14.3	39	14.3	34	12.5	118	43.2	2.679	0.444
No	15	5.5	51	18.7	53	19.4	36	13.2	155	56.8		

Table 3: Relationship between of overweight and obesity and ready food patterns According to BMI

Variable	BMI								Total		P-Value
	Underweight		Normal		Overweight		Obesity				
	No	%	No	%	No	%	No	%	No	%	
Eating pizza											
< 3 T/W	11	4.0	44	16.1	43	15.8	20	7.3	118	43.2	0.043*
≥ 3 T/W	10	3.7	46	16.8	49	17.9	50	18.3	155	56.8	
Eating burger											
< 3 T/W	19	7.0	76	27.8	70	25.6	63	23.1	228	83.5	0.21
≥ 3 T/W	2	0.7	14	5.1	22	8.1	7	2.6	45	16.5	
Eating shawarma											
< 3 T/W	15	5.5	52	19.1	63	23.1	40	14.7	170	62.3	
≥ 3 T/W	6	2.2	38	13.9	29	10.6	30	11	103	37.7	0.13
Eating fries											
< 3 T/W	7	2.6	66	24.2	78	28.6	61	22.3	212	77.7	0.29
≥ 3 T/W	13	4.7	24	8.8	14	5.1	9	3.3	61	22.3	

Table 4: Physical exercise, watching TV, using computer/mobiles smoking and alcohol consumption characteristics associating with overweight and obesity according to Body Mass Index (BMI)

Variable	BMI								Total		Chi-Square	P-Value
	Underweight		Normal		Overweight		Obesity					
	No	%	No	%	No	%	No	%	No	%		
Physical activity												
Yes	11	4.0	44	16.1	43	15.8	19	7.0	117	42.9	9.739	0.021*
No	10	3.7	46	16.8	49	17.9	51	18.7	156	57.1		
Watching TV hour / day												
< 3	19	7.0	76	27.8	71	26.0	63	23.1	229	83.9	5.697	0.127
≥ 3	2	0.7	14	5.1	21	7.7	7	2.6	44	16.1		
Using computer, mobile hour / day												
< 3	15	5.5	62	22.7	63	23.1	30	11	170	62.3	15.166	0.002*
≥ 3	6	2.2	28	10.3	29	10.6	40	14.7	103	37.7		
Smoking												
Yes	03	1.1	14	5.1	14	5.1	4	1.5	35	12.8	4.278	0.233
No	18	6.6	76	27.8	78	28.6	66	24.2	238	87.2		
Alcohol consumption												
Yes	00	00	00	00	1	0.4	00	00	1	0.4		
No	21	7.7	90	33.0	91`	33.3	70	25.6	272	99.6	1.975	0.578

Discussion

Obesity is not only considered as a disease in itself, but it also gives rise to and aggravates many others, and is thus known to be a risk factor for certain chronic diseases, in particular being closely associated with pathologies like diabetes, cardiovascular diseases, osteoporosis and certain types of cancer [18].

The findings indicate that, the prevalence of overweight and obesity among adults was 33.7% and 25.6% respectively. These findings lower with that found in Sudan (45.8%) [12]. in Nigeria70.7% [13]. Our result was higher than that found in Sudan 30% and19.2% respectively [15]. Also this result higher than that found among Sudanese patients with type 2 diabetes mellitus 16.8% and 6.9% respectively [16].

The prevalence of obesity among adults in this study was (25.6%), higher than that found in Spanish (17%) [18]. in Ethiopia (9.4%) [20].

The study showed, higher frequencies of overweight and obesity among females than males (32.2%, 33.3% and 26.3%, 12.2%) respectively. This results in line with that found in the Middle East and North Africa, overweight and obesity higher among females than males [19]. In Zambia 24.7% (21.0% among males and 27.3% among females) [9]. In obesity was significantly more prevalent in women (24.7%) than men (9%) [21].In Turkey 18.8% of the adult population was obese (28.5% among women and 9% among men) [7].

The results indicate that, there was statistical significant between overweight /or obesity and not practiced physical activity (p=0.021). Level of physical activity was not a protective factor for obesity, but rather findings suggest that intensity of physical activities was protective [21]. These findings in line with than reported among Spanish adults, the prevalence of obesity found among those whit no physical exercise is double that found in those who do [18]. Our results disagree with that found by Erem in Turkey; he mentioned obesity is associated negatively with physical activity [7]. Also disagree with that reported among adults in Australia, physical activity was not associated with overweight or obesity [1].

Regarding to food patterns the study found there was statistical association between frequency of eating pizza ≥ 3times per week and overweight /or obesity (p=0.043).

According to analysis the results was found statistical association between obesity and those using computer/or mobile more than 3hours per day (P=0.002).

The study revealed that there is no statistical association between overweight/or obesity and smoking and alcohol consumption (P > 0.05). this findings disagree with that found in Turkey, obesity was associated positively with smoking cessation, alcohol consumption [7]. In Spanish adults no observe an association between BMI and the subject being a smoker or non-smoker [18].

Conclusion

In this study the prevalence of overweight and obesity was found to be among adults 33.7% and 25.6% respectively. In analysis; sex, not practiced physical activity, eating pizza ≥ 3times per week and using computer/or mobile more than 3hours per day were significantly associated with overweight and/or obesity.

References

1. Giles-Corti B, Macintyre S, Clarkson J P, Pikora T and Donovan R J. Environmental and Lifestyle Factors Associated With Overweight and Obesity in Perth, Australia. American Journal of Health Promotion 2003; 18(1): 93-102
2. Flegal KM, Kit BK, Orpana H, et al. Association of all-cause mortality with overweight and obesity using standard body mass index categories: a systematic review and meta-analysis. JAMA 2013; 30(9):71–82.
3. Ellulu M, Abed Y, Rahmat A, Ranneh Y and Ali1F. Epidemiology of obesity in developing countries: challenges andprevention. HOAJ. Glob Epidemi Obes. 2014; 2:2
4. World Health Organization controlling the global obesity epidemic. 2008.
5. World Health Organization Global strategy on diet, physical activity and health. 2008.
6. Ellulu M, Abed Y, RahmatA, RannehY and Ali1F. Epidemiology of obesity in developing countries: challenges and prevention. HOAJ. Glob Epidemi Obes. 2014; 2:2.
7. Erem C. Prevalence of Overweight and Obesity in Turkey. IJC Metabolic & Endocrine 2015; 8.:38–41
8. Jacoby E, Goldstein J, Lopez A, Eloisa N and Lopez T. Social class, family, and life-style factors associated with overweight and obesity among adults in Peruvian cities. Preventive Medicine 2003; 37:396–405
9. Zyaambo C, Babaniyi O, Songolo P, Muula AS, Rudatsikira E, Mukonka VM and Siziya S. Prevalence and Determinants for Overweight and Obesity among Residents of a Mining Township in Kitwe, Zambia: A population-based Survey. iMedPub Journals 2012; 4(1)
10. Dalichaouch-Benchaoui. Sand Abadi N. Factors Associated With Overweight and Obesity Among Adults in Constantine. International Journal of Science and Research (IJSR) 2014; 3(9): 910-915
11. Alemu E, Atnafu A, Yitayal M and Yimam K. Prevalence of Overweight and/or Obesity and Associated Factors among High School Adolescents in Arada Sub city, Addis Ababa, Ethiopia. Nutrition & Food Sciences. 2014; 4(2).
12. Ajani SR, Susan HJA and Oluwaseun A. Gender differences in factors associated with overweight and obesity among civil servants in Lagos, Nigeria. International Journal of Nutrition and Metabolism 2015;7 (6):66-73.
13. Abu-Aisha H, Elhassan E, Khamis A and Elmaali A. Chronic Kidney Disease in Police Forces Households in Khartoum, Sudan, Arab Journal of Nephrology and Transplantation 2009; 2(2): 21-6
14. Ahmad NM, Hassan DA, El Hussein AM and Abdulhadi NH. Obesity and cardiovascular disease risk factors among adult Sudanese. Sudan Journal of Medical Sciences 2011; 5(4).
15. Abu-Aisha H, Elhassan EAM, Khamis AH and Abu-Elmaali A. Hypertension and obesity in police forces households in Khartoum, Sudan: A pilot report - part of the "Police Forces Hypertension, Diabetes, Renal Insufficiency, and Thyroid Derangements (HyDRIT) Study", Sudan). Sudanese Journal of Public Health 2008; 3(1).
16. Elfaki A M H. Prevalence of hypertension and obesity among Sudanese patients with type 2 diabetes mellitus. Sky Journal of Medicine and Medical Sciences 2015;4(2):020 – 022
17. Cochran, WG. Sampling Techniques, 2ed Ed 1963; New York: John Wiley and Sons, Inc.
18. Rodriguez-Martin A, Ruiz J PN, Nieto JMM and Jimenez LE. Life-style factors associated with overweight and obesity among Spanish adults. Nutrition Hospital 2009; 24(2):144-151
19. Toselli S, Gualdi-Russo E, Boulos DNK, Anwar DA, Lakhoua C, Jaouadi I, Khyatti M and Hemminki K. Prevalence of overweight and obesity in adults from North Africa. European Journal of Public Health 2014; 24(1): 31–39
20. Alemu E, Atnafu A, Yitayal M and Yimam K. Prevalence of Overweight and/or Obesity and Associated Factors among High School Adolescents in Arada Sub city, Addis Ababa, Ethiopia. Nutrition & Food Sciences 2014; 4(2).
21. Shayor GA and Mugusi FM. Prevalence of obesity and associated risk factors among adults in Kinondoni municipal district, Dar es Salaam Tanzania. BMC Public Health201111:365