Original Research Article

Risk factors associated with overweight and obesity occurrence among female students

Abstract:

Aims: The study was conducted to assess the risk factors leading to the development of obesity among female students to adopt strategies to combat this problem and decrease the risk.

Methodology A cross-sectional study method was conducted among 129 participants at the University in 2017. Stratified proportional random sampling was taken. The electronic questionnaire and body mass index (BMI) observational checklist were used for consented participants who agreed to participate in the study

Results: Descriptive statistics, the Chi-Square, and T-test were used. The studied subject's ages range from 18> to 25yers, most of them were single (93%), and their economic status was moderate. Most of the participants consumed unhealthy diets rich in carbohydrates, and fat. Also, more than 60 % of participants consumed low vegetables and fruits. Chi squire showed insignificantly overweight among low fruit consumers while the obesity among moderate fruit consumers (p-value 0.813).

Conclusion: This study explored the occurrence of both overweight and obesity were strongly associated with risky lifestyles for participants.

keywords: risk factors; overweight; obesity; female; students and lifestyle.

1. INTRODUCTION

The occurrence of overweight and obesity affects different communities. Many modifiable developmental factors contribute to them including a lack of basic nutritional knowledge about healthy and energy-dense foods eating habits, physical inactivity, sleep patterns, diseases, and medications.[1,2] They are defined by the World Health Organization (WHO) as a BMI of 25-29.9 kg/m^2 and a BMI ≥ 30. Obesity is a major pandemic of the 21st century, which lead to increased morbidity, mortality, and the burden of healthcare costs.[3]Increased prevalence of obesity leads to serious conditions such as heart disease, type 2 diabetes, stroke, and cancer as well as increased annual medical costs. In the United States (2017–2018) the age-adjusted prevalence of obesity increased from 30.5% to 42.4%, and the prevalence of severe obesity increased from 4.7% to

9.2%. Medical costs for people who had obesity were $1,429 higher than medical costs for people with a healthy weight. The need for seeking preventable measures [4]

Primary prevention of overweight and obesity among adults can be achieved through early screening and health education for associated risk factors, and health [5,6] BMI is most used as the tool to estimate and screen for overweight and obesity in adults and children. Body Mass Index (BMI) was classified according to the WHO international classification of adult BMI as follows: Underweight (<18.50 kg/m^2), Normal range (18.50–24.99 kg/m^2), Overweight (25.00–29.99 kg/m^2), and Obese (≥30 kg/m^2).[7,8] WHO recognizes the critical importance of reducing unhealthy diet and physical inactivity and adopts the WHO Global Strategy for prevention [8,9]

The aim of the study is to assess the risk factors associated with the development of overweight and obesity among participants.

2. MATERIALS AND METHODS

A cross-sectional community-based study design. It was conducted in November 2017 at a nursing college and the students graduated with a bachelor's degree.

Research questions

- ✓ Did study populations suffer from developmental factors of overweight and obesity?
- ✓ What are the common lifestyle risk factors among the study populations?

Research population and sampling

The studied sample were students who graduated with a bachelor's degree from three classes at nursing college. Sampling technique and sample size: A probability sampling technique was followed and selected sample size using stratified proportional random sampling formula. [9,10] fulfilling inclusion criteria.

Sample size Used the equation below for the calculation of the total study sample from all three classes' students; then selected randomly the proportion from each class.

Equations and Formula: This is an equation used for determining the sample size of participants.

Equations: n = N/ 1+N (D2) etc. n is the desired sample size, N: is the population size, D: is the degree of accuracy desired or the accepted margin of error and is usually set to 0.05).

Step 1: Determine the total population for three classes; used the academic list and calculated the number of students for each class at the nursing college

Step 2: Calculated sample size using above equation; n = N/ 1+N (D2).

Step3: Determine stratified proportion randomly

Constructing probability (representative) samples. Used formula and calculated sample size randomly according to strata and proportion of each class.

Data collection tools

The research data collected used the electronic structured questionnaire and measurement checklist. The electronic structured questionnaire consisted of two sections of demographic data (sex, age, level of education, marital status, economic status inactivity, unhealthy diet, and sleeping disturbing patterns). The questionnaire was tested twice prior to conducting the study on four to ten samples then any correction was done and reviewed by experts to assure its validity, reliability, and clarity.

2. **Data analysis**: Data collected used both interviewing and observational techniques.[11,12] Data were analyzed by the Statistical Package for Social Sciences (SPSS) Version 16 after collection and cleaning. Statistical methods used for data analysis are a descriptive method, a T-test the mean reflected the regression distribution and a chi-square test. The result will be presented in figures and tables

3. RESULT AND DISCUSSION

3.1 Result:

A cross-sectional study method was conducted among 129 participants their education at 11,111,1V levels. The study was carried out in the Kingdom of Saudi Arabia (KSA) on female students in nursing college at Umm Al-Qura University at Makah Al –Makaramma in 2017. The selection of participants fulfilled the inclusion criteria. The studied subject's ages range from 18≥25yers (mean 1.51 + 2SD .517), most of them were single (93%), and (88 %) had moderate economic status. The figure below reflected the BMI (60%) of participants within the normal body weight.

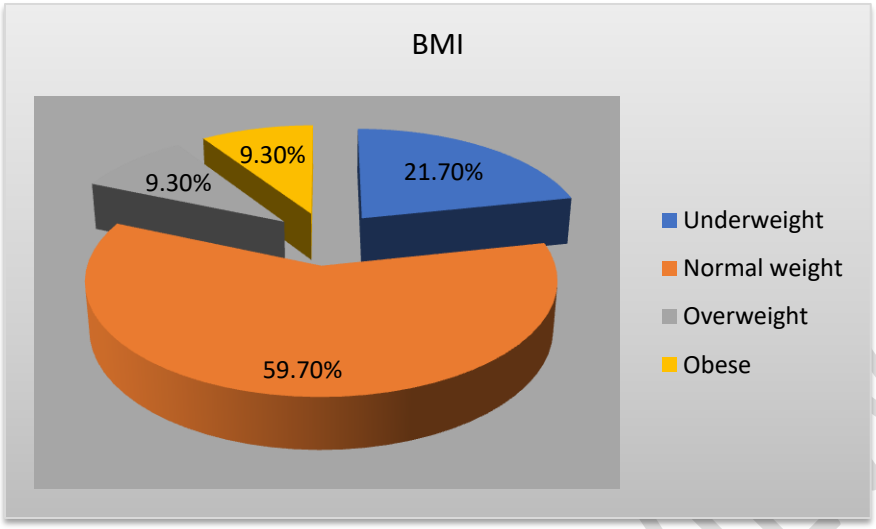

Figure (I): Body Mass Index (BMI) among participants (n=129)

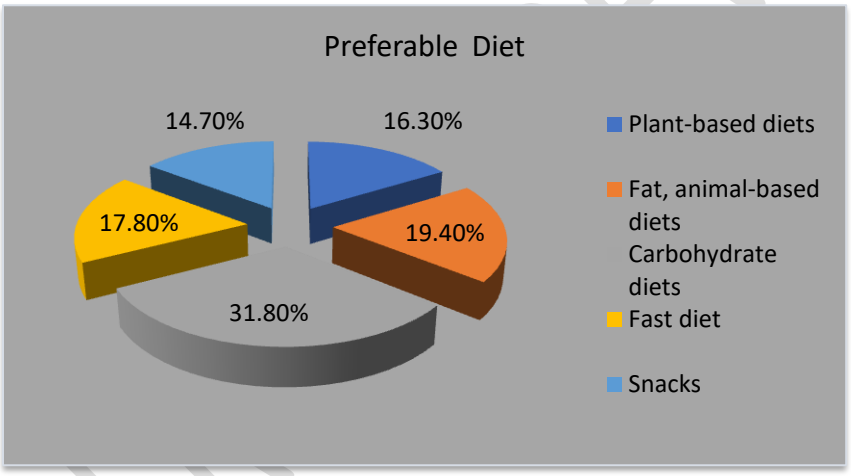

Figure (II): Participants' Preferable Diet (n=129).

Table 1: body mass index (BMI) * versus preferable types of diet among participants (n=129)

Preferable types of diets	**BMI Categories.**	Total

	Underweight	Normal	Overweight	Obese	Freq.	%
Plant-based diets	14.3%	57.1%	14.3%	14.3%	21	100.0%
Fat, animal-based	32.0%	48.0%	12.0%	8.0%	25	100.0%
Carbohydrate diets	17.1%	70.7%	7.3%	4.9%	41	100.0%
Fast diet	26.1%	52.2%	8.7%	13.0%	23	100.0%
Snacks	21.1%	63.2%	5.3%	10.5%	19	100.0%
Total	21.7%	59.7%	9.3%	9.3%	129	100.0%

P value = 0.846

This figure and table above reflected that (31.8%) of participants consumed carbohydrate diets,(19.40)fast animal diets,(17.8%) fast diets,(14.7%) snacks only (16.3) consumed a plant-based diet. This indicated most of the participants consumed an unhealthy diet. And there was insignificant overweight and obesity among participants who consumed a plant-based diet, P-value = 0.846. Also, the searcher noticed that the participants with normal weight were at high risk in the future.

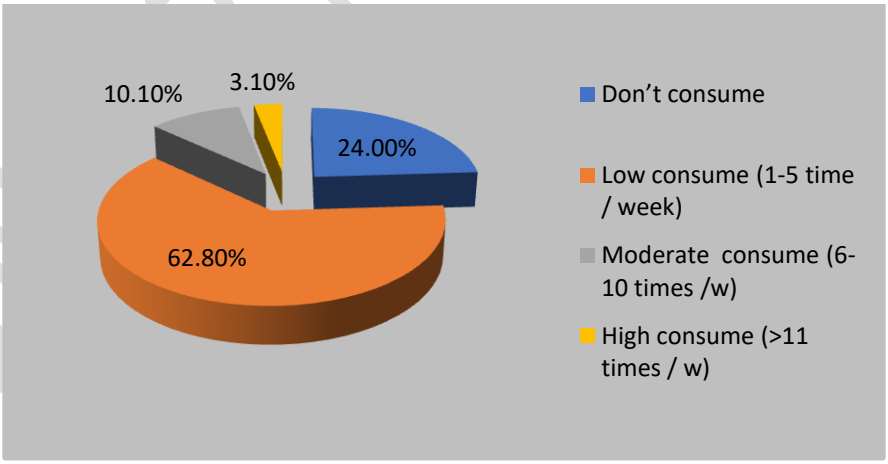

Figure (III): Number of Fruits consumed by Participants/week (n=129).

24% didn't consume fruits 62.8% consumed low fruits and 10.1 % consumed moderately only 3.1% consumed more than 11-time fruits/week this indicates of most of the participants neglected the benefits of the fruits.

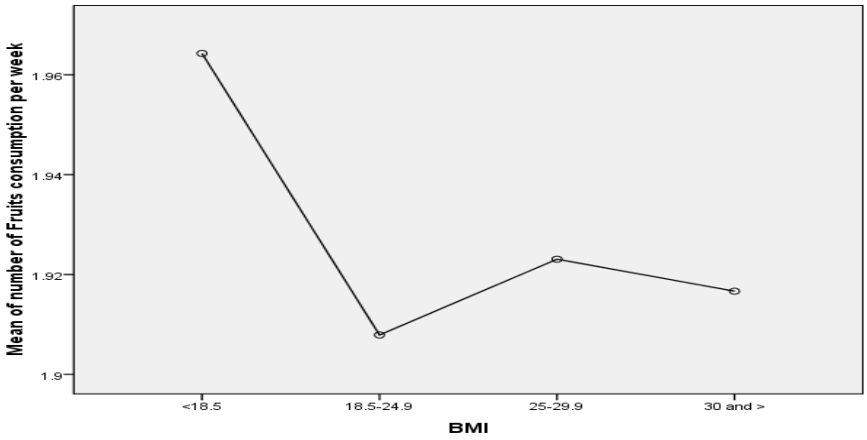

Figure (IV): Mean of fruit consumption compared with BMI (n=129).

The regression distribution reflected those underweight participants at a high average of fruits consumption per week rather than overweight and obese ones.

Table 2: Body mass index (BMI) versus fruit consumed by participants

Number of Fruits consumption per week	**BMI Categories.**				Total	
	Underweight	Normal	Overweight	Obese	Freq.	%
Don't consume	19.4%	64.5%	6.5%	9.7%	31	100.0%
Low (1-5 times)	23.5%	56.8%	11.1%	8.6%	81	100.0%
Moderate (6-10 times)	7.7%	69.2%	7.7%	15.4%	13	100.0%
High (>11 times)	50.0%	50.0%	0.0%	0.0%	4	100.0%
Total	21.7%	59.7%	9.3%	9.3%	129	100.0%

P value= 0.813

This table reflected insignificant that overweight participants consumed low fruits while moderate amounts were consumed by obese throughout the week (p-value = 0.813).

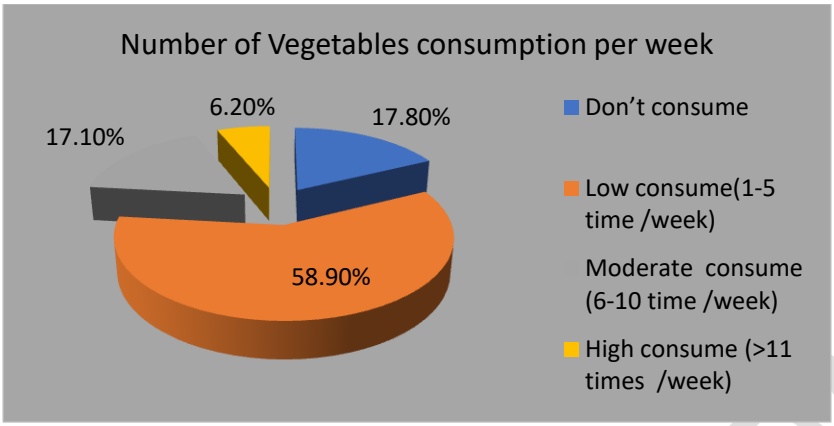

Figure (V): Number of Vegetables consumed by Participants/week (n=129). Mean = 1.92

17.8% didn't consume fruits 58.9% consumed low Vegetables and 17.1 % consumed moderately only 6.2% consumed more than 11-time vegetables/week this indicated most of the participants neglected the benefits of the vegetable, but the degree of consumption was better than fruits.

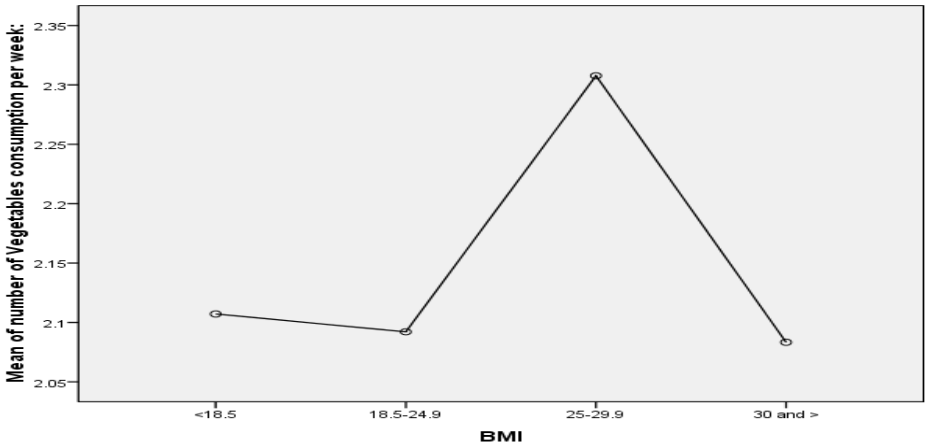

Figure (VI): Mean of vegetable consumption compared with BMI (n=129).

In this figure regression distribution reflected that overweight participants had a higher average of vegetable consumption /week.

Table 3: Body mass index (BMI) versus vegetables consumed by participants(n=129).

Number of vegetable consumption per week	BMI Categories.				Total	
	Underweight	Normal	Overweight	Obese	Freq.	%
Don't consume	13.0%	60.9%	13.0%	13.0%	23	100.0%
Low (1-5 times)	25.0%	60.5%	6.6%	7.9%	76	100.0%
Moderate (6-10 times)	27.3%	54.5%	9.1%	9.1%	22	100.0%
High (>11 times)	0.0%	62.5%	25.0%	12.5%	8	100.0%
Total	21.7%	59.7%	9.3%	9.3%	129	100.0%

(P = 0.635)

This table reflected that there was insignificant overweight among highly vegetable consumers and the obesity among didn't vegetable consumers participants (p-value = (0.635).

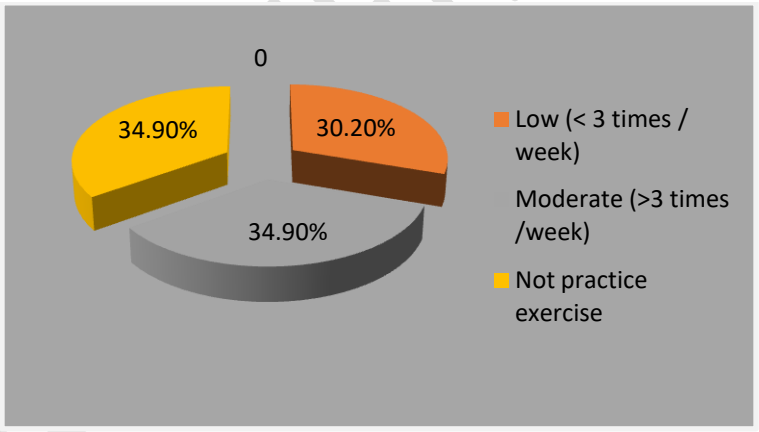

Figure (VII): Quality Participants' exercise /week (n=129). Mean = 2.0

35% of participants didn't practice exercise and 35% did moderate-quality exercise and 30% practiced low-quality exercise etc. The quality of exercise among participants was poor these indicters of high-risk participants.

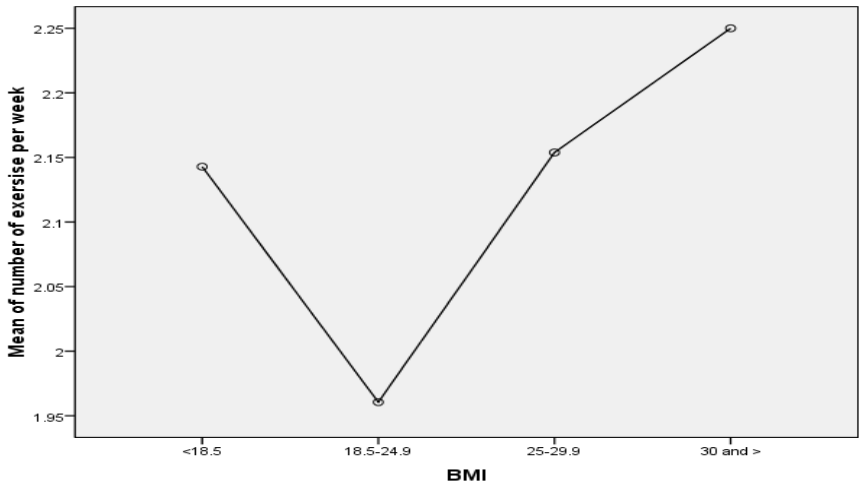

Figure (VIII): Mean of Physical Activity compared with BMI of participants (n=129)

In this figure, the regression reflected that the overweight and obese participants active than normal once; this inverse result indicated the high risk of this group in the future.

Table 4: Body mass index (BMI) * versus physical activity among participants (n=129)

Number of exercises/times weeks	**BMI Categories.**				Total	
	Underweight	Normal	Overweight	Obese	Freq.	%
Low(< 3 times a week)	20.5%	69.2%	5.1%	5.1%	39	100.0%
Moderate (≥ 3 times a week)	17.8%	57.8%	13.3%	11.1%	45	100.0%
No. Exercise	26.7%	53.3%	8.9%	11.1%	45	100.0%
Total	21.7%	59.7%	9.3%	9.3%	129	100.0%

(P = 0.629)

It is insignificant that the participants who are overweight with moderate physical exercise while the participants who are obese among both moderate and who didn't practice exercise P-value = 0.629.

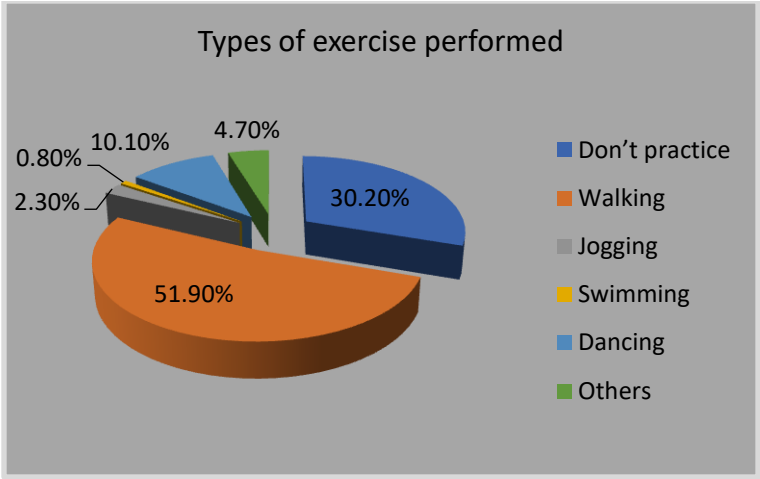

Figure (IX): Types of exercise performed by participants (n=129).

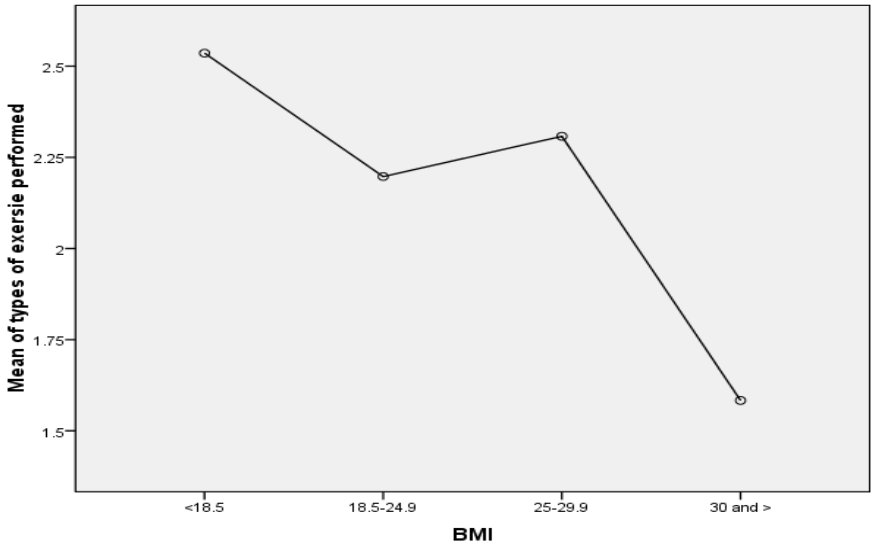

Figure (X): Mean of types of exercise compared with BMI of participants (n=129).

Table 5: body mass index (BMI) * versus types of exercise performed by participants (n=129)

Types of Exercises	BMI Categories.				Total	
	Underweight	Normal	Overweight	Obese	Freq.	%
Don't practice	17.9%	64.1%	0.0%	17.9%	39	100.0%
Walking	20.9%	56.7%	16.4%	6.0%	67	100.0%
Jogging	0.0%	100.0%	0.0%	0.0%	3	100.0%
Swimming	0.0%	1.0%	0.0%	0.0%	1	100.0%
Dancing	46.2%	53.8%	0.0%	0.0%	13	100.0%
Others	16.7%	66.7%	16.7%	0.0%	6	100.0%
Total	21.7%	59.7%	9.3%	9.3%	129	100.0%

(P = 0.010)

Most of the participants demonstrate walking exercise but it is significant that the obesity was observed among participants who didn't practice exercise while overweight among the participants who demonstrated walking exercise 'this indicator of the low quality of walking so the education program was needed to enhance quality and high benefits.

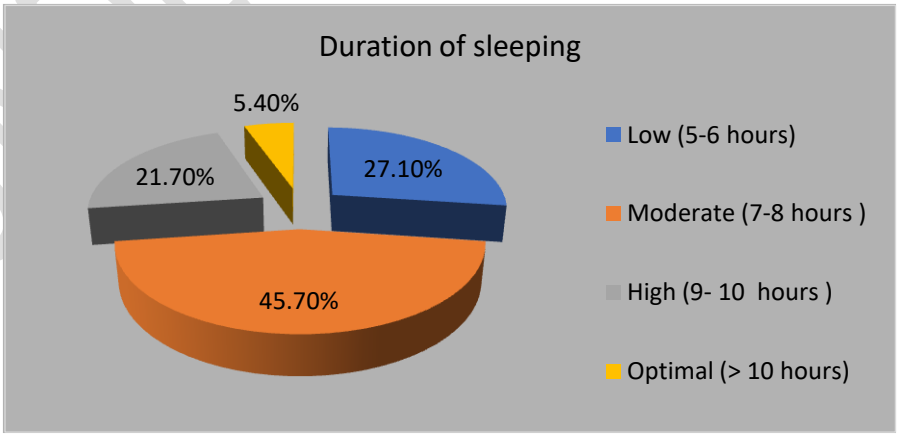

Figure (XI): Duration of sleeping among participants (n=129).

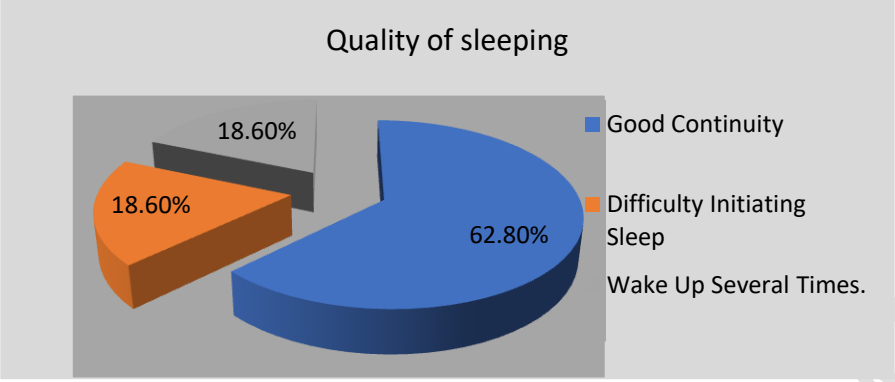

Figure (XII): Quality of sleeping among participants (n=129).

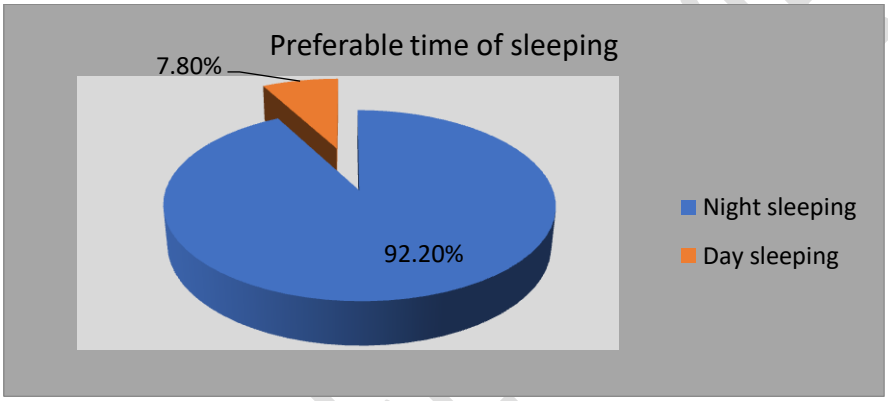

Figure (XIII): Preferable time of sleeping among participants (n=129).

Table 6: body mass index (BMI) * Versus Duration of sleeping among Participants(n:129)

Duration of sleeping	BMI Categories.				Total	
	Underweight	Normal	Overweight	Obese	Freq.	%
Low (5-6hrs.)	11.4%	71.4%	11.4%	5.7%	35	100.0%
Moderate (7-8hrs.)	25.4%	55.9%	8.5%	10.2%	59	100.0%
High (9-10 hrs.)	25.0%	53.6%	10.7%	10.7%	28	100.0%
Optimal (>10 hrs.)	28.6%	57.1%	0.0%	14.3%	7	100.0%
Total	21.7%	59.7%	9.3%	9.3%	129	100.0%

(P = 0.816)

The figure above reflected that most of the participants have good continuity sleeping patterns at night duration but it was insignificant that overweight participants had low sleeping hours, while obesity among optimal sleeping hours (P-value = 0.816.).

Table 7: Body mass index (BMI)* versus quality of sleeping among participants (n=129)

Quality of sleeping	BMI Categories.				Total	
	Underweight	Normal	Overweight	Obese	Freq.	%
Good continuity	23.5%	59.3%	7.4%	9.9%	81	100.0%
Difficulty initiating sleep	8.3%	75.0%	12.5%	4.2%	24	100.0%
Wake up several times	29.2%	45.8%	12.5%	12.5%	24	100.0%
Total	21.7%	59.7%	9.3%	9.3%	129	100.0%

(P = 0.397)

It was insignificant that the overweight participants had poor sleeping quality i.e. difficulty initiated sleeping and awaked up several times while obesity was high among participants who awaked up several times during sleeping (P-value = 0.397)

3.2 Discussion

The body mass index (BMI) mean in this study was carried out among female nursing students in the Kingdom of Saudi Arabia (KSA) to detect overweight and obesity occurrence factors; was 21.964 less than BMI Comparative with a standardized case-control study on the association between obesity and myocardial infarction in 52 countries. They reported that the mean BMI was lowest in South Asia (24.9), intermediate in central and Eastern Europe (26.7), and highest in North America (27.7)[14]

Also, the study reflected that there was underweight among studied subjects (20.1%) but less hazard than overweight and obesity according to WHO studies for population among world's countries there were overweight, and obesity kills more people than underweight.[15,16]

The development factors of overweight and obesity among participants in this study were high consumed carbohydrates (31.8%), fatty diet (19.4%), and fast diet (17.8%) rather than. A plant-based diet (16.3%). In addition, most of the participants consumed an inadequate amount of fruit and vegetable (62.8%), and 24% didn't consume them. This reflected the neglect of the importance of consuming vegetables and fruits.

this result agreed with the World Health Organization and the American College of Sports Medicine study in Arab countries found that high blood cholesterol levels; inadequate intake of fruit, vegetables; physical inactivity, and smoking [7,9=9,10] Also when you look at regression distribution and between fruit consumption relation to BMI it overweight among low fruits consumers and obesity among moderate one is insignificant and the regression with abnormal or inverse this indicator of fluctuated of fruits consumption [5] Also, the relation between vegetable consumption and BMI, we found that is insignificantly obesity among unconsumed vegetables and the regression with abnormal slope at overweight within high average consumers this need more search for types and ways of preparation of vegetables [6]

this study agrees with this study Only 5.5% of Australian adults had an adequate daily intake of 2 fruit and 5 vegetable servings in this study.

The need to consider strategies to increase fruit and vegetable consumption.[17] In 2010 Global Burden of Disease Study estimates 16,140 deaths per year and morbidity attributed to low fruit and vegetable intakes in Australia. Vegetables should be consumed in a nutrient-dense form, with limited additions such as salt, butter, or creamy.[18]

Although fruit juice can be part of healthy eating patterns, it is lower than whole fruit in dietary fiber and when consumed in excess can contribute extra calories. Therefore, at least half of the recommended number of fruits should come from whole fruits. When juices are consumed, they should be 100% juice, without added sugars. Also, when selecting canned fruit, choose options that are lowest in added sugars. One-half cup of dried fruit counts as one cup-equivalent of fruit Similar to juice, when consumed in excess, dried fruits can contribute extra calories[17.] Fruits with small amounts of added sugars can be accommodated in the diet if calories from added sugars do not exceed 10 percent per day and total calorie intake remains within the limits of [18]

Also, their other risk was inactivity most of so 34.9% cannot perform any type of exercise while 30% demonstrated a low level which leads to a rise in the percentage of prevalence of obesity.

When you look at the regression relation was inverse. There was significant obesity high among inactive participants who didn't perform any exercise and overweight among participants who perform walking exercises (P-value = 0.010). Also, when we look at quality, duration, and time of sleeping among participants were adequate. this finding was agreed with the study. Almost half (48.9%) are obese or overweight, and the quality of the diet, severe pain, and severe dysfunction are significantly associated with physical inactivity in adults with knee Osteoarthritis Exercises.[19] Also agree with this study conducted on the Omani population in 2012 the main factors associated with overweight and obesity among the study participants; are physical inactivity and lack of basic nutritional knowledge about healthy foods and energy-dense foods[9].

This study reveals that most of the participants sleep at night rather than in the daytime, they have high quality and more than 7 hours period daily sleeping. This disagrees with our findings. The majority found a significant association between short sleep (generally <6 h per night) and increased obesity risk A meta-analysis of 18 studies in 604 509 adults demonstrated a pooled obesity odds ratio (OR) of 1.55 (1.43–1.68; $P < 0.0001$) for less than 5 h of sleep and a dose-effect of sleep duration such that for each additional hour of sleep BMI decreased by 0.35 kg/m.[2,20]

Many studies have seen a high BMI in people who do not get enough sleep. Some studies have seen a relationship between sleep and the way our bodies use nutrients for energy and how lack of sleep can affect hormones that control hunger urges.[21]

Several factors contribute to increasing overweight and obesity among women in low-income settings and sub-Saharan Africa (SSA), and these include environmental and lifestyle factors, genetics, and diseases. Additionally, high socioeconomic status, increasing age, parity, and marital status. Physical inactivity and poor dietary patterns are characterized by a high intake of calorie-rich, processed, and however, little is known about the role of physical activity and nutrient intake.[22]

A similar study conducted among women in Jordan to assess risk factors for developing chronic diseases was significantly associated with obesity and elementary education. For chronic conditions, the percentages of hypertension, diabetes, hypertriglyceridemia, osteoporosis, and rheumatoid arthritis were significantly correlated with increased BMI in Jordanian women.[23]

4. CONCLUSION

This study explored that the prevalence of overweight and obesity among nursing students at Um-Al- Qura University were similar while confirming that both were strongly associated with many factors which lead to elevated BMI among participants such as inactivity, and inadequate consuming fruits, and vegetables. However, it the importance to control occurrence factors as soon as to prevent the onset of overweight and obesity in near future. So, adaptation education program and further interventional research for those participants about technique and frequency of exercise, consuming vegetables and fruits interventions to provide healthier foods follow the evidence-based the current research conducted on BMI reduction.

5. LIMITATIONS OF THE STUDY

Firstly, the limitation of the study didn't measure abdominal waist and hip circumference which strongly correspond with serious communicable diseases such as myocardial infarction and stroke. The second limitation some other risks related to obesity and overweight were not studied such as medications and diseases that the participant suffered from.

Recommendations

To construct teaching program for health promotion, following international and global strategies on a diet, physical activity, and health to enhance awareness regarding physical activity, health behaviors of eating, fruits and vegetable consumption for maintenance of a healthy weight could be important in the prevention of obesity complications and to have a good healthy life. Also, facilitate and encourage people to regularly assessment of their weight and calculate BMI. Also, participation of sectors of society, policymakers, employers, and health care leaders can support the prevention of obesity and its risk and develop several resources for providing healthier food and beverage options in workplaces.

COMPETING INTERESTS

The author declared that no competing interests exist.

Ethical consideration And Consent: Approval for conducting the study was obtained from the office of the Advisor for Academic Affairs committee at Umm-Al Qura University. Permission was taken from managers of the nursing college; the head of the nursing practice department and written consent and agreement of participation were taken.[13]

References:

1. Harvard School of Public Health Obesity Prevention *https://www.hsph.harvard.edu/obesity-prevention-source/obesity-trends/*
2. Lena V. Kallingsa,b,c, etals . Beneficial effects of individualized physical activity on prescription on body composition *http://journals.sagepub.com/doi/pdf/10.1097/HJR.0b013e32831e953a* / 2008
3. Tchang BG, Aras M, Kumar RB, et al.(2020)Pharmacologic Treatment of Overweight and Obesity in Adults https://www.ncbi.nlm.nih.gov/books/NBK279038/ Publisher
4. Craig M. Hales, M.D., Margaret D. Carroll, M.S.P.H., Cheryl D. Fryar, M.S.P.H., and Cynthia L. Ogden, Ph.D ; Prevalence of Obesity and Severe Obesity Among Adults: United States, 2017–2018https://www.cdc.gov/nchs/products/databriefs/db360.htm
5. Hilbert A. (2016) Social facilitation maintenance treatment for adults with obesity *https://www.ncbi.nlm.nih.gov/pubmed/27580827:*
6. Hashim Al-Kilani, Mostafa Walyand Randa Yousef, 2012.Trends of Obesity and Overweight among College Students in Oman Sultan Qaboos Univ Med J. 2012 Feb; 12(1): 69–76. PMCID: *PMC3286720 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3286720/*
7. Sultan Qaboos Univ. WHO 2012 , Obesity and overweight Fact sheet Updated June 2016 available *http://www.who.int/mediacentre/factsheets/fs311/en/SQUMJwww.squ.edu.om/squmj*
8. Jessica L. J. Greenwood et al. (2013) Creating a Clinical Screening Questionnaire for Eating Behaviors Associated with Overweight and Obesity The Journal of the American Board of Family Medicine.
9. The political Declaration of the high-level meeting of the United Nations General Assembly on the Prevention and Control of Non- communicable Diseases of September 2011, *https://www.un.org/en/ga/ncdmeeting2011/*
10. Saad Salman M. Alqarni (2016) Review the Overweight and Obesity in Saudi Arabia King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh, Kingdom of Saudi Arabia *http://obesity.imedpub.com/a-review-of-prevalence-of-obesity-in-saudi-arabia.php?aid=17699*

11. Stratified random sampling http://www.statisticshowto.com/stratified-random-sample/ Journal of Pharmaceutical Research International 33(42B): 84-91, 2021; Article no. JPRI.73280 ISSN: 2456-9119 (Past name: British Journal of Pharmaceutical Research, Past ISSN: 2231-2919, NLM ID: 101631759.

12. Tolonen H. How to Anthropometric measurement: Recommendation for indicators, international collaboration, protocol, and manual of operations for chronic disease risk factor surveys.
13. Ade Height Measuring Tape Wall Mounted Extendable, Wall Mounted Height Measuring Tape.
14. Hassanat Elbashir Mohammed Mustafa1,2* and Badria Abd Alla Mohamed Elfaki1,2 2021 Prevalence of Obesity and Overweight among Female Nurse Students, Umm Al-Qura University, Makkah, Saudi Arabia *(sdiarticle4.com)*.

15. National Institutes 0f Health (2011) Overweight and Obesity Statistics U.S. Department of Health and Human Service / WIN Weight-control Information Network
16. WHO (2017) To improve maternally, infant and young child Nutrition *http://www.who.int/nutrition/global-target-2025/en.*
17. National Institutes of Health (NIH) (2017) Explore Overweight and Obesity *https://www.nhlbi.nih.gov/health/health-topics/topics/obe/causes* February 23, 2017.
18. J Cardiovasc Nurse. Author manuscript; available in PMC Jan 1. Published in final edited form as J Cardiovasc Nurse. 2009; 24(1): 58–80. *doi: 10.1097/01.JCN.0000317471.58048.32 (4) 2010*
19. Sanjay T Varadappa1,et al (2014) Prevalence of Obesity among College Students in Rural Area of Bangalore www.njcmindia.org / p ISSN 0976 3325 | eISSN 2229 6816
20. Andrea S. Richardson, Joanne E. Arsenault, Sheryl C. Cates, and Mary K. Muth (2115) Perceived stress, unhealthy eating behaviors, and severe obesity in low-income women; Published online 2015 Dec 3. doi: 10.1186/s12937-015-0110-4 PMCID: PMC4668704 *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4668704/*
21. Abdulrahman O. Musaiger (2011); Review Article Overweight and Obesity in Eastern Mediterranean Region: Prevalence and Possible Causes.

22. *U.S. Department of Health and Human Services and U.S. Department of Agriculture.* 2015 – 2020 Dietary Guidelines for Americans. *8th Edition. December 2015. Available* at https://health.gov/dietaryguidelines/2015/guidelines/.2015-2020 Dietary *1 2 3 4 5 Page* Guidelines for Americans.
23. Dominic Mosha etal, (2021) Risk factors for overweight and obesity among women of reproductive age in Dar es Salaam, Tanzania *https://bmcnutr.biomedcentral.com/articles/10.1186/s40795-021-00445-z.*
24. Bustami M , Matalka KZ, Mallah E , Abu-Qatouseh L, Abu Dayyih W, Hussein N, Abu Safieh N, Elyyan Y , Hussein N, Arafat T The Prevalence of Overweight and Obesity Among Women in Jordan: A Risk Factor for Developing Chronic Diseases *https://www.dovepress.com/journal-of-multidisciplinary-healthcare-journal2021*.
25. Hassanat Elbashir Mohammed Mustafa1,2* and Badria Abd Alla Mohamed Elfaki1 Prevalence of Obesity and Overweight among Female Nurse Students, Umm Al-Qura University, Makkah, Saudi Arabia ,2 Journal of Pharmaceutical Research International 33(42B): 84-91, 2021; Article no.JPRI.73280 ISSN: 2456-9119