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Effect of Nitro Counseling on Lifestyle of Obese Adolescence

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Abstract

Introduction: Obesity during adolescence represents a strong predictor of higher mortality in adulthood; thus, lifestyle interventions represent the recommended therapy.

Objective: To evaluate the effect of nitro counseling on lifestyle of obese adolescence, and develop life changing program.

Method: Quasi-experimental design was conducted between October 2021 and January 2022. A total of 117 university nursing students participated from two universities in Palestine. A self-reported questionnaire was used for data collection and included the following: socio-demographic characteristics, university students' knowledge, practices adolescent lifestyle, and anthropometric measurement to detect body mass index. The nitro counseling program was performed over three and half months. Percentage, mean value, standard deviation, Chi-square (X2), T paired test, and proportion probability (*p*-value), when $p < 0.05$ or < 0.02 it is statistically significant difference.

Results: The results revealed that 34.1% of students weren't aware of obesity pre-counseling, while it was improved to 93.1% post-nitro counseling implementation with highly statistical significance ($p < 0.001$). Less than half of adolescence were obesity class1, and more than one-third were obesity class II. There was a highly significant difference between students' knowledge and their practices pre- and post-nitro counseling program implementation.

Conclusion: This study confirmed that the total effect of obesity on adolescence self-esteem, social distress, and physical health demonstrated a highly significant difference between pre- and post-implementation of nitro counseling program. In addition to, improved adolescence knowledge and practices pre- and post-counseling implementation.

Keywords

nitro counseling, lifestyle, adolescence obesity, nursing students, Palestine

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Introduction

Obesity has become an epidemic and affecting individuals of all ages; adolescents are particularly susceptible to obesity due to their decrease in physical activity. Obesity is increasing at an alarming rate around the world, affecting both children and adults in developed and developing countries. More than 1.9 billion adults (39%) were overweight. Over 600 million of these (13%) were obese globally (WHO, 2021). However, the prevalence of obesity alone in the male and female populations of the United States was 37.9 and 41.1%, respectively (Hales et al., 2017). Obesity prevalence among adults in Palestine is similar to that of the United States, with 30% of men and 49% of women obese (Abdul-Rahim et al., 2003; Ng et al., 2014).

Obesity is a significant health risk. It has been shown to be responsible for an estimated 216,000 deaths, accounting for approximately one in every 10 deaths among US adults (Danaei et al., 2009). Obesity raises the risk of chronic diseases like metabolic syndrome, insulin resistance syndrome, cardiovascular disease, type II diabetes, and some cancers (Batran et al., 2021; Berrington de Gonzalez et al., 2010). According to the Palestinian Ministry of Health, these diseases are the leading causes of death in Palestine, accounting for roughly half of all fatalities (Ministry of Health [MoH],

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2020). Furthermore, obesity-related illnesses in adults are estimated to cost $209.7 billion in US national medical care costs, or 20.6% of US national health expenditures (Cawley & Meyerhoefer, 2012). As a result of the scarcity of studies on adolescence, obesity in Palestine requires serious attention due to the high prevalence in adults, who account for approximately 38.1% of the Palestinian population (United Nations Population Fund Activities [UNPFA], 2021).

Evidence-based interventions for overweight/obese youth include family-based lifestyle programs that emphasize diet quantity and quality, physical activity, sedentary behavior, and behavioral strategies to support change. In Palestine, a few previous studies on adolescent obesity and overweight that focused on prevalence with little attention paid to risk factors. Furthermore, previous studies were either self-reported or had a small range of student ages, with the majority of them focusing on older ages (>12 years old). These studies are old, with the most recent one conducted in 2016, revealing that the prevalence of underweight, overweight, and obesity among children was approximately 7.3%, 14.5%, and 15.7%, respectively (Al-Lahham et al., 2019). Therefore, this is the first time (a) to assess the adolescence's knowledge regarding obesity, nutritional habits, and their reported practices regarding healthy and unhealthy food, (b) to develop and implement nitro counseling for adolescents with obesity according to their needs, and (c) to evaluate the effectiveness of nitro counseling on improvement of adolescence knowledge, body mass index (BMI), life style, and their practices regarding obesity.

Review of Literature

Health professionals, particularly nurse practitioners, have an important role in promoting preventative measures and encouraging positive lifestyle behaviors, as well as identifying and treating obesity-related co-morbidities. They also have a role in counseling patients about safe and effective weight loss and weight management programs. Prevention and management programs for overweight and obesity include the availability of information about the reality of overweight and obesity among various population groups particularly nursing group. Availability of information will assist in setting goals and targets to reduce the prevalence of overweight and obesity such as healthy eating practices and nutritional knowledge. Eating practices have been indicated as a direct determinant of this problem (Triches & Giugliani, 2005).

The nitro counseling program is based on the idea that obese adolescents require basic knowledge about obesity and its consequences, realize basic knowledge-related nutritional habits, and its consequences on health during adolescence stage, encourage the university youth to change their practices and beliefs toward weight reduction, and introduce ideal practices related to taking the healthy food and regular physical exercises (Pbert et al., 2016). This program was first developed by years ago by Dr Tran Tien Chanh, a general practitioner and a doctor of nutrition, sports medicine and biology. Dr Tran Tien, Chanh has focused his career and research on nutrition with a particular emphasis on obesity (Pbert et al., 2016).

According to the WHO European Childhood Obesity Surveillance Initiative (COSI), one in three children aged 14–18years were overweight or obese in Europe (WHO, 2017). Among boys, the highest prevalence of obesity was found in Cyprus and Italy (21%), followed by Spain and Greece (20%), while among girls the highest prevalence was found in Cyprus (19%) and Spain (17%), and followed by Malta (15%) and Greece (14%) (Garrido-Miguel et al., 2019). Low self-esteem has been shown to have a negative correlation with obesity (Benton et al., 2015). Due to the negative valuation of the society regarding obesity, obese individuals tend to suffer from low self-esteem (Murray et al., 2017). The adverse effects of obesity in adolescence potentially lead to long-term consequences until adulthood (Benton et al., 2015). Low self-esteem is also associated with behavioral disorders, cynical and depressive moods, and negative and uncontrollable emotions (Harter & Whitesell, 2003). Juveniles' and adolescents' increased weight state has been consistently associated with body dissatisfaction. Obesity at certain stages of life especially adolescence may harm the self-esteem, and negative body image is additionally common among people with childhood or adolescent onset of increasing weight (Álvarez-García et al., 2019).

Population trends suggest that overweight children are heavier than overweight youth in previous decades. Such trends are disconcerting given the psychosocial and physical health risk associated with being overweight in childhood (Garrido-Miguel et al., 2019). Long-term health risk seems greater for overweight adolescents than for younger overweight children, independent of adult weight (Kris, 2015). Obese adolescents are also more likely to track obesity into adulthood than younger children (Williams et al., 2020). These factors make adolescent weight control high priority (Quek et al., 2017).

A relation between weight status and low self-esteem has also been established. Adolescents suffer many cognitive and psychological changes in this critical transition to their adulthood. Low self-esteem can lead to serious problems as substance abuse, depression, and suicidal ideations (Malina et al., 2004). Obesity in this age group, leads to high morbidity and mortality in adulthood. Obesity is a global health issue, which has become an epidemic with the potential to affect all age groups (El-Kassas & Ziade, 2017). According to statistics, 170 million children aged less than 18 years had obesity in 2008, and it is predicted that this number will reach 30% of all children across the world by 2030 (Álvarez-García et al., 2019).

Weight gain is common among adolescence students, but it is variable, depending on multiple factors (Racette et al., 2008). The transition from home to college may be one of the most dramatic changes a young adult has ever experienced with a change in environment, restrictions (or lack thereof), social norms and unhealthy exposures, and behaviors (Holm-Denoma et al., 2008). An increase in calories, poor dietary choices, minimal physical activity, and stress are some of the leading contributors to weight gain among college students. The college years imply a significant change in the lifestyles of young adults; however, college years are also crucial for the establishment of dietary patterns. Studies have reported a higher incidence in college students adopting unhealthy eating behaviors such as skipping meals, frequent snacking on energy-dense food, and engaging in unhealthy weight loss or weight gain methods (Ha & Caine-Bish, 2009).

Increased values of BMI affect the quality of life (QOL) and particularly the physical health of the individual. There is a well-established relationship between weight and lifestyle in women. In general, as BMI increases, lifestyle decreases and reasons for this difference in weight-related lifestyle are still unclear. There is evidence to support that self-perception of weight status may influence physical and mental aspects of QOL (Cox et al., 2011).

Physical inactivity contributes to weight change among adolescence. Adults need at least 150 min of moderate-intensity aerobic activity a week for at least 30 min a day, at least 4 days a week and 2 or more days a week of muscle-strengthening activities. Moderate-intensity aerobic activity is categorized as brisk walking, water aerobics, riding a bike on level ground, pushing a lawn mower, etc. Muscle-strengthening activities should include the work of all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) to include lifting weights, using resistance bands, the use of body weight for resistance (push-ups and sit ups), heavy gardening, or yoga (CDC, 2015a, 2015b). The nurse can play a critical role to prevent obesity as educators and role models for their families, and communities. In the United States of America, many nurses provide weight-related health information to the public (Lowen, 2012).

Method

Study Design

A quasi-experimental design was conducted to evaluate the effects of nitro counseling on lifestyle of obese adolescence.

Sample and Setting

The total number of students study at two universities in Nablus, Palestine (Faculty of Nursing /An-Najah National University, and Nabulus University for Vocational & Technical Education/ Ibn Sina College for Health Professions); the total population of two university approximately 23,300 students. The students were chosen as a total number of 120 purposive samples, 65 from Ibn Sina, and 52 from An-Najah through the year 2021/ 2022 met the inclusion and exclusion criteria with a response rate 89.1%, the study sample included 117 students that were chosen from both settings. The inclusion criteria for this study included university male and female students BMI of 85–95 percentiles for obesity and weight gain of more than 95 percentile, male and female students who enrolled in fourth academic years/faculty of nursing and accepted to participate in the study, also 10% (18) students were chosen randomly as a pilot study and excluded in the study sample.

Data Collection

A convenience sampling method was used to collect data from participants at two universities in Nablus, Palestine (Faculty of Nursing /An-Najah National University, and Nabulus University for Vocational & Technical Education/ Ibn Sina College for Health Professions). The researchers collected data from eligible participants at college students' rooms. The participants were invited and recruited to answer the questionnaire after identifying that they were BMI 85–95 and met the other inclusion criteria. Eligible participants were college students aged from 20 to 25 years (90.6%), with a BMI between 85 and 95, as determined by plotting BMI against percentile curves of the standard growth charts; underweight: < 5th percentile of BMI; normal weight: 5th to <85th percentile of BMI; overweight: 85th to <95th percentile of BMI and obese: ≥ 95th percentile. Potential participants were approached in their college student rooms and were invited to participate in the study after meeting the inclusion criteria. Those interested were given a consent form, and the study questionnaire commenced upon agreement. Participants who chose not to participate had the questionnaire closed at that point. The questionnaire was self-administered by participants after receiving instructions on how to proceed. Researchers were available to clarify any questions or concerns during the data collection process. Participants were informed about the study objectives and procedures before providing written consent. They were assured of their voluntary participation and the option to withdraw at any stage without facing any consequences. The data collection phase took place between October 2021 and January 2022.

Measurement

The researchers designed and constructed self-administered questionnaire based on the recent related literature review and experts' opinion. The researchers modified the study instrument as per the experts' recommendations. The researchers carried out a pilot test on 18 respondents using the final version of the questionnaire and made corrections accordingly for the feasibility and content applicability of

the questionnaire. The Arabic language is the primary language in Palestine; thus, the researchers used the Arabic version of the questionnaire in the study. The respondents of the pilot study were excluded from the main study. The researchers pre-tested the instrument's items for the reliability of internal consistency before the questionnaire was released. The Arabic version of the questionnaire in this study had acceptable reliability with Cronbach's alpha coefficient of 0.85, 0.92, 0.88, 0.91, and 0.85, respectively, for knowledge regarding obesity, knowledge regarding nutritional habits, practice regarding health and unhealthy diet, and practice regarding regular exercise.

the Components of the Questionnaires

The questionnaires had three sections related to the study objective. The first section included 34 items divided into five parts. Part 1 included six personal characteristics such as age, sex, marital status, place of residence, and monthly income. Part 2 composed of four questions that assessed adolescence university students' knowledge regarding obesity pre-/post-nitro counseling; meaning of obesity, complication, method of weight reduction, and types of exercises that help in weight reduction. Part 3 comprised of 10 questions that Assessed adolescence knowledge pre/post about nutritional habits and its consequences; meals, component of healthy diet, most healthy way of cooking, the main food groups, high carbohydrate, high fiber, high calories of food, type of food contain calcium, complication of obesity, and advice for control fat. Part 4 composed of one question that assessed practices of adolescence student regarding the healthy and unhealthy diet. According to healthy plate components were half of plate with fruit and vegetables, a quarter with whole-grains, a quarter with meat and fish, with a focus on calcium-rich food. Part 5 contain 13 questions regarding adolescence practices for regular exercises.

The second section is adolescent lifestyle profile which was designed specifically to evaluate the healthy lifestyle behaviors of adolescents (Hendricks et al., 2006; Pender et al., 2002) and consisted of 20 items regarding their physical health, it included nine items, self-esteem included five items, and social distress included six items, always with the score 1, sometimes score 2, and rarely score 3. Used (pre-post) nitro counseling program: the instrument uses a 3-point scale response format (sometimes, rarely, and always), with scores ranging from 1 to 3. The Cronbach' alpha coefficients for the original subscales were 0.83 and 0.87, respectively.

The third section is an anthropometric measurement to detect BMI by (CDC, 2015a, 2015b). Three variables were measured by the researcher, weight, height, and BMI, the height was recorded to the nearest 0.5 cm. The subject stood upright barefooted or in thin socks and bareheaded using a height scale measurement to take height. The weight was recorded to the nearest 1 Kg using appropriate international standards scales, and 0.5 kg standard weight for assessing and adjusting the scales were used. Weight was taken without shoes and with light clothing and BMI, which is a measure of body fatness. It was calculated by the equation: BMI = Weight in Kg / Height^2 in meters. In this study, growth charts for adolescents were used by plotting BMI against percentile curves of the standard growth charts and underweight: < 5th percentile of BMI; normal weight: 5th to <85th percentile of BMI; overweight: 85th to <95th percentile of BMI and obese: ≥ 95th percentile for age and sex compared to corresponding percentile.

Ethical Consideration

The ethical approval was obtained from Nablus University for Vocational and Technical Education/Ibn Sina College for Health professions (Researchers' workplace) (Ref: Nrs. September. 2021/33). The investigation conforms to the principles outlined in the Declaration of Helsinki. The respondents were made aware of the aims and purposes of the study, and their full right to accept or freely refuse to participate or withdraw at any time without any consequences. All responses were anonymous, kept strictly confidential, and used for research purposes only, and the results did not identify the respondents personally. A written consent was obtained from all participants before answering the questions.

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 21 was utilized for the data analysis. The researchers used percentage, mean value, standard deviation, Chi-square (X2), *T* paired test, and proportion probability (*p*-value), when *p*-value < 0.05 is statistically significant difference.

Results

Sample Description

Demographic characteristics showed that 90.6% of adolescence student's age was ranged between 20 and 25 years old, 73.5%, were female, 91.5% of them were single and 59.8% resident at rural area, while 31.7% of them were lives at urban area. Concerning monthly income 53% had income < (2000–5000), as seen in (Table 1).

The results reveal that the total correct knowledge of adolescents related to nutritional habits reported 43.6% pre-nitro counseling while changed to 89.7% post-nitro counseling implementation with highly significance differences at *p*-value <0.001.

Moving to the total regular exercise practices of adolescents, the results show that 7.2%, 18.1% of adolescent students had always and sometimes practices of regular exercises pre-counseling while improved to 80.7% and 14.8% at post, respectively, regarding total regular exercise. There was a

highly significant difference between student's practices regarding exercises pre-, post-nitro counseling at $p < 0.001$.

Furthermore, 47.0% of adolescence were obese class1, 38.4% were obese class II, 10.3% were obese class III and only 4.3% of them were overweight, as seen in (Figure 1)

Table 1. Distribution of University Students According to Their Socio Demographic Characteristics (N=117).

Items	NO	%
Age		
20-25 years	106	90.6
>25years	11	9.4
Sex		
Male	31	26.5
Female	86	73.5
Marital status		
Single	107	91.5
Married	10	8.5
Place of residence		
Urban	37	31.7
Rural	70	59.8
Camps	10	8.5
Monthly income		
Sufficient	3	2.5
Sufficient & save.	29	24.8
not sufficient	85	72.7
Number of family member		
<3-5 members	18	15.5
6-8 members	63	53.8
>8 members	36	30.7
Number of rooms of students' houses		
1–3	35	30.0
> 3	82	70.0

Moreover, the results illustrate that 71.9% & 16.1% of adolescent students had always and sometimes—total physical effect of obesity on their physical health pre-nitro counseling while changed to 18% & 19.3% post-nitro counseling. Regarding self-esteem, the study reports 77.9% & 14.8% of adolescent students had always and sometimes-while changed to 78.9% of students had rarely post-nitro counseling effect. Finally, social distress pre-/post-nitro counseling manifests an always percentage of 58% changed to a rarely percentage of 16.6%. Overall, there was a highly significant difference between pre- and post-nitro counseling program at $p < 0.001$.

From other side, the results show highly significant improvement in student's regarding obesity and their healthy habits post-nitro counseling with highly statistically differences between pre- and post-counseling program implementation at $p < 0.001$, as seen in (Table 2).

Finally, the results reported that there was a highly statistically significant difference between adolescent student obesity and their lifestyle as regards physical, self-esteem and their social distress at $p < 0.001$, as seen in (Table 3).

Discussion

Obesity is now well recognized as a disease in its own, one which is largely preventable through changes in lifestyle. The prevalence of obesity defined as a BMI of ≥30 is increasing worldwide and is regarded as one of the biggest challenges for public health. According to the WHO, there \were about 2.3 billion overweight people aged 17 years and above, and over 700 million obese people worldwide in 2016 (WHO, 2021).

According to socio-demographic characteristics of the adolescent students, the current study revealed that most of

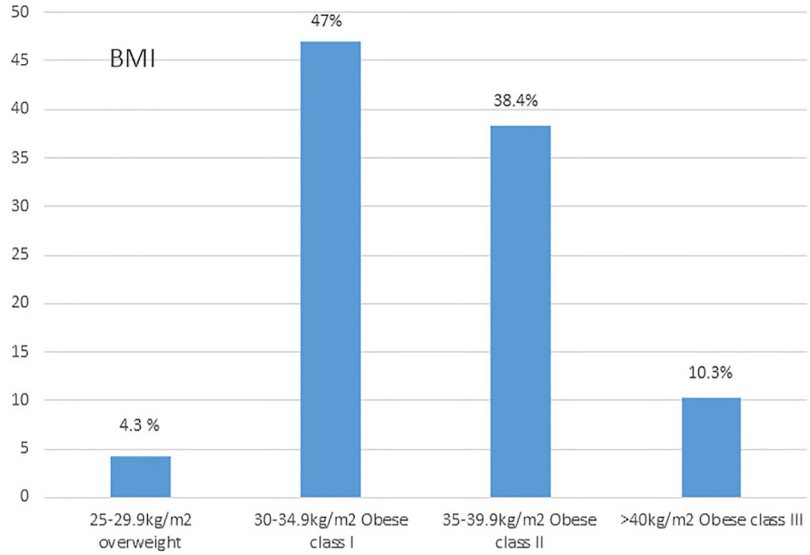

Figure 1. Distribution of adolescent students according to their Body Mass Index (N=117).

Table 2. Difference Between Pre and Post Counselling of Obesity and Healthy Habits of the Adolescent Students.

	Studied subjects					
	Pre-Counselling (n=117)		Post-Counselling (n=30)			
Healthy habits	N	%	N	%	Chi test	p-value
Healthy food intake						
Adequate	31	26.5	23	76.7	25.861	.0001*
Inadequate	86	73.5	7	23.3		
Unhealthy food intake						
Yes	98	83.8	8	26.7	38.700	.0001*
No	19	16.2	22	73.3		

* Significant at p< 0.05

Table 3. Difference Between Lifestyle and Obesity of the Adolescent Students at Pre and Post-Test.

	Studied subjects					
	Pre-Counselling (n=117)		Post-Counselling (n=30)			
Lifestyle	N	%	N	%	Chi test	p-value
Physical health						
Mild	78	66.7	3	10	40.054	.000*
Moderate	17	14.5	4	13.3		
Active	22	18.8	23	76.7		
Self esteem						
High	92	78.6	8	26.7	34.894	.001*
Medium	18	15.4	10	33.3		
Low	7	6.0	12	40		
Social distress						
Yes	88	75.2	9	30	21.748	.001*
No	29	24.8	21	70		

* Significant at p< 0.05

the students' age was ranged from 20 to 25 years old, more than two-thirds were female. This result in the same line with the results of the study about demographic and health survey, population at Palestinian by Al-Riyami and Afifi (2003), who stated that the highest obesity prevalence (42.1%) was in the age group 18–40; significantly higher than the other age groups, being overweight and obesity was increasing with age. The researcher believes that this differences in results can be attributed to age group differences, which supported by the CDC (2022a, 2022b), that clarify obesity affects some groups more than others.

Regarding family income, this study revealed that more than half of the participants' income < (2000–5000), which is consistent with the results of the study on overweight and obesity among adolescence in Jordan by Khader et al. (2009), who found that the less daily pocket money was associated with overweight, while family monthly income associated with obesity. Moreover, these results are similar to Krebs et al. (2007), who studied obesity and relation with family income in USA; they reported that the prevalence of obesity in the United States is lower among those of higher socioeconomic status (SES). The researcher thinks that obesity is not only a condition of high SES groups in developing countries; the risks of obesity tend to shift from lower SES groups to poorer groups. This may be the reason behind high economic index being more likely to be overweight and obese (Population Reference Bureau [PRB], 2013).

Regarding BMI of adolescence, the current study revealed that less than half of them were obesity class1, more than one-third were obesity class II, one-tenth were obesity class III, and only less than one-tenth of them were overweight. This finding comes in the same stream with the results of studies from Kuwait and Saudi Arabia indicating a range of adolescent overweight/obesity (using NCHS/WHO reference) between 35 and 45%, While in Palestinian study on 2131 survey, which was conducted among Palestinian

adolescents aged 18–25 years in (2013/2014), it reported the existence of overweight/obesity of (20.4%) among boys and (23.0%) among girls (Al-Isa, 2004). This could be due to the limited availability of exercising facilities for Palestinian girls and women. Also, this result could be explained by high-calorie food intake, a lack of awareness of the health risks associated with obesity, and a more sedentary lifestyle, both of which are thought to cause weight gain. Our results were similar to what was found by Griffiths et al. (2010), where the prevalence of overweight/obesity was (15.0%) among boys and (18.3%) among girls in the USA adolescents using the same definition. However, such a comparison must be taken with caution study among adolescents in Palestine due to self-reported weights and heights.

In terms of adolescents' knowledge about obesity, the current study found that more than one-third of students had total knowledge about obesity pre-intervention. The majority of them improved their knowledge following the nitro counseling intervention, with highly significant differences pre-/post-intervention, where this can be explained by the fact that the sample was made up of university students. This finding contradicts the findings of Swift et al. (2009) study on obese students attending weight management clinics in the United Kingdom, which found that obese adolescents had little knowledge about the health risks of obesity. Furthermore, this finding contradicted the findings of a study on weight loss practices and their effects on the nutritional status of Saudi females attending weight loss clinics in Riyadh, where the university college obesity reported that 9.9% of them had good knowledge, 56.1% had fair knowledge, and 34% had poor knowledge at the pre-test period. At the post-test, those with a high level of knowledge still made up the smallest proportion (10.8%) (Albassam et al., 2007). This may be explained by the fact that the majority of our sample was university students.

In terms of adolescents' knowledge about nutritional habits and their effects on health during adolescence, the current study found that less than half of students had correct knowledge prior to counseling intervention, but this changed to the majority of them post-intervention, with highly statistically significant differences adolescent pre-/post-counseling among weight loss methods. This finding contradicts a study of obese youth in Taiwan (18–25) who participated in a fitness program and reported that obese youth consume high-fat and high-sugar food habits, which may be due to fewer health education programs conducted by healthcare providers to prevent childhood obesity (Hu et al., 2007). The researcher believes that good nutritional knowledge and behavior among adolescents is important to avoid health problems that can continue into adulthood. Culturally specific, school-based educational interventions are required to instill sound nutritional knowledge in adolescents and to motivate the diet and behavior changes required to promote health across the lifespan (World Health Organization - Regional Office for the Eastern Mediterranean, [WHO-EMRO], 2017).

Concerning adolescents' practices in terms of regular exercises pre-post-nitro counseling, the results showed that less than a quarter of university students had always and sometimes practiced regular exercises prior to counseling, while it increased to more than two-thirds post-counseling in terms of total regular exercise. There was a highly significant difference between practices of adolescence among students in terms of exercises prior to and after the nitro counseling program. This finding is consistent with the findings of a study on obesity among people in the United States by Ross et al. (2009), which found that there were significantly greater improvements in the health transition for participants in the physical activity group compared to participants in the control group. The same result is supported by Andenæs et al. (2012), who discovered that morbid youth obesity in the Kingdom of Norway showed statistically significant improvements in physical activity, self-care, and activities over a 12-month period. From our perspective, this result could be because most students have easy access to indoor food stimuli and are uninterested in doing daily exercise and physical activity to improve their lifestyle. In 2022, CDC alarming that regular physical activity in childhood and adolescence is important for promoting lifelong health and well-being and preventing risk factors for various health conditions like heart disease, obesity, and type 2 diabetes.

Regarding the effect of obesity on adolescents' regular exercise, the current study found that more than two-thirds of university students' physical health was affected by obesity. As a result, the percentage was changed to more than one-third of the students post-counseling. In addition to that, over than half of students had always and sometimes total social effect, which post-nitro counseling intervention changed to less than one-quarter. Our results consisted with the finding of a study on obesity among Portuguese students conducted by Vieira et al. (2012), which discovered that all variables were different between normal weight and overweight/obese students. In terms of body image, higher obesity levels were associated with lower psychosocial scores. This can be explained that regular exercise promotes physical and social health. People who have overweight and obesity, compared to those with healthy weight, are at increased risk for many serious diseases and health conditions (CDC, 2022a, 2022b).

This study revealed highly statistically significant differences in adolescent student obesity (BMI) and lifestyle in terms of physical, self-esteem, and social distress. This is supported by a study that found overweight and obese adolescents have low self-esteem (Alvani et al., 2016; Radziwillowicz & Macias, 2014). A study conducted by Shi et al. (2005) also revealed significant reductions in global self-esteem and QOL in obese youth. Similarly, Colpan et al. (2018) conducted

a study in a large adolescent group and on adolescents. Obese and overweight people were found to have lower self-esteem and more conflict with their peers. We thought that obesity is generally caused by eating too much and moving too little, which emphasize the importance of developing and implementing effective health promotion strategies for school-aged children in order to prevent an overweight and obesity epidemic that could last into adulthood. Schools can also promote health outside of the classroom by providing opportunities for students to eat healthy and stay active (Harvard.edu, n.d.).

Limitations and Strengths

These results of the present study are not conclusive and have some limitations. First, the study recruited two universities from one part (northern) of the Palestine. Second, a convenience sampling technique was used for data collection, leading to primarily nursing college respondents. All these limitations could affect the generalizability of the study results to the entire population of Palestine. The fact that this study concentrated on nursing students is a notable strength. This would help to clarify the health status of those who are obese or overweight. In addition, engaging these students would benefit the society through tangible involvements that are capable of solving community-related issues such as raising awareness of dominating health matters.

Implications for Practice

The study has important implication for nursing education and practice, and health policy. This study highlighted the level of awareness among students who are understudied. Thus, the study revealed important information about those population towards their health. Nurses play a significant role in providing holistic care to individuals, families, and the community. Specifically, community/public health nurses' role include educating public about their needs to monitor and improve their health. Therefore, knowing and understanding nursing students' levels of awareness towards obesity or overweight would improve nurses' preparedness and readiness to provide proper services, materials, and education to them.

Conclusion

Obesity is affecting individuals of all ages, and it has been found to be prevalent among Palestinian students. Moreover, obesity has increased dramatically and rapidly in a short period of time due to rapid urbanization and transition from traditional to Western lifestyles. Gender, age, and place of residence were found to be associated with Palestinian adolescents' BMI in our study. Therefore, our findings suggest a serious focus on obesity in Palestinian adolescence. As a result, obesity prevention should be a national public health priority to reduce and prevent it at an early stage. We recommend routine screening for obesity and diets as part of the ongoing healthcare. In addition, providing health education programs for promoting physical activity among students and constantly monitoring obese adolescents to encourage them to develop healthy lifestyle practices.

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