The Effected of Health Education on Knowledge and Attitudes About Diet for Obesity Prevention in Students at Saudi Arabia 2024

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Abstracts

Background: Obesity and overweight are major public health problems that are considered a global pandemic due to disease and biological risk factors linked to non-communicable diseases. The World Health Organization (WHO) defines obesity and overweight as abnormal or excessive accumulation of fat and classifies it according to a body mass index (BMI) of higher than 25 and 30 kg/m2, for overweight and obesity, respectively. Obesity is characterized as an abnormal or excessive buildup of fat that is harmful to health. Health education involves changing behaviors in a dynamic way, going beyond merely imparting knowledge or concepts from one person to another. Very important of health education was to ascertain how health education affected students at Makkah region in Saudi Arabia knowledge and attitudes regarding obesity prevention diets. In response to the growing burden of Obesity and overweight on the healthcare system and in pursuit of the health sector goals of Saudi Vision 2030, the Saudi Arabian Ministry of Health implemented an initiative known as health education, which helps patients with Obesity and overweight adopt a healthier lifestyle . The study aimed: To evaluation the effected of health education on knowledge and attitudes about diet for obesity prevention in students at Saudi Arabia 2024.Method: Cross-sectional survey

was utilized students in Saudi Arabia 2024 during the Sepbtmber to October, 2024, a total of 300 student aged 12–20 years, available students. A structured self-reported questionnaire sheet was used to evaluation effected of health education on knowledge and attitudes about diet for obesity prevention in students in Saudi Arabia 2024. Result: show regarding the age most participants in more than16 were (41.0%) gender of participated female were (58.0%) regarding Income level in study the most of participant's Below 5000 SR were (31.0%) health condition in study the most of participant's healthy were (56.0%) Sources of information about obesity most of participant's booklets and brochures were (45.0%) followed by educational films were (40.0%) while own personal experience were (32.0%) but mass media were (32.0%).Conclusion: Effected of health education on knowledge and attitudes about obesity prevention diets for students at Saudi Arabia. It is recommended that students continue to adopt a healthy diet and increase physical activity that involves optimal body movement to prevent obesity.

Keywords: Evaluation affected, health, education, knowledge, attitudes, diet, obesity prevention, students, Saudi Arabia.

1. Introduction

Obesity and overweight are serious public health issues that are regarded as a global pandemic. Due to disease and biological risk factors associated with non-communicable diseases (1). Obesity and overweight are defined by the World Health Organization (WHO) as abnormal or excessive accumulation of fat, and they are categorized based on body mass indexes (BMIs) more than 25 and 30 kg/m2, respectively (2). Globally, obesity is a leading cause of morbidity and mortality (3). Regarding the care management of obesity and overweight diseases, attitudes and practices may be influenced by a lack of awareness (4).

A long-term imbalance between entering and exiting energy is the condition known as obesity (6). The energy required for metabolism and daily tasks is less than the energy consumed from digested food. This extra energy will be stored as fat and adipose tissue, which can lead to weight gain and poor health. Being overweight or obese is one of the numerous nutritional issues that still exist today and can have an impact on one's health (7).

According to WHO. Globally, the number of obese people is rising (>1 billion). In Saudi Arabia, like in the Arabian Gulf countries, over half of the adult population is obese, whereas two-thirds of the adult population in Europe is obese (9). Being overweight and Environmental, genetic, behavioral, and socioeconomic variables compound the causes of overweight. Dietary consumption and physical exercise are established risk factors for obesity and overweight (11).

In Saudi Arabia, Due to changing lifestyles brought about by the expansion of the economy, technological advancements, the availability and variety of food, and shifts in the living conditions of the populace, obesity and overweight rates have increased in Saudi Arabia.(12) As a result, dietary choices, energy intake, and energy expenditure changed. The Saudi populace was shown to have detrimental eating behaviors that are significantly linked to a higher BMI, including missing breakfast every day, eating emotionally, and snacking frequently on unhealthy snacks such crisps, candies, and fizzy drinks (13)

Furthermore, the climate, culture, lack of time, and lack of equipment all contribute to the physical inactivity of some Saudis (14).

As one moves from adolescent to maturity, learning about nutrition may still be connected to education, where knowledge is obtained from reliable sources without subjective interpretation.(16) At the same time, attitudes on food and nutrition as well as nutrition knowledge can be found in the social environment, including social media (17). False beliefs may rise as a result of increased exposure to online information. However, subjective knowledge is another characteristic of an individual (18).

The high incidence of obesity in the Kingdom of Saudi Arabia necessitates an examination of primary care physicians' awareness regarding the management of this condition. This understanding will enable policymakers to formulate strategies aimed at educating the younger population. The rising rates of obesity across different regions have garnered considerable interest from medical professionals, as the prevalence of diabetes and obesity is anticipated to rise in the future, driven by lifestyle changes and unhealthy dietary habits among individuals in Saudi Arabia. (20)

According to a study of obesity and eating habits, it was found that there is a rapid socio-cultural change as a result of the growing economy of the Saudi Arabia. This has affected the eating patterns and thus it has been reported for the recent increases in overweight and obesity among Saudi population. (21) Another important factor in obesity is psychological stress such as life in adolescent period. (22) Adolescent period can play a significant role in encouraging healthy behavior in students. Unhealthy lifestyle is prevalent among school students and therefore there is a need to integrate health education programs for school students.(23)

2. Literature Review

A study conducted by Aljohani et al. (2021) revealed that the analysis indicated education level serves as a protective factor against obesity. Specifically, individuals with at least a high school education exhibited a 20% reduced risk of being overweight compared to those with only a junior high school education or less. (24)

This finding aligns with the research by Alotaibi et al. (2022), which demonstrates that college graduates face a lower risk of obesity compared to those who have completed only primary school (RR=0.96). Individuals with higher educational attainment tend to excel in receiving, processing, interpreting, and utilizing information, particularly regarding nutritional knowledge. Those with advanced education generally possess greater nutritional awareness due to increased experience and access to information, leading to improved nutritional attitudes and practices, especially concerning dietary habits and physical activity, both of which are closely linked to obesity.(25)

Research indicates that an individual's self-assessed competency may influence behavior more significantly than objective knowledge. Nevertheless, a person possessing sufficient knowledge of nutrition is more likely to distinguish between factual nutritional information and popular misconceptions, thereby contributing to obesity prevention. (26) This understanding can

subsequently shape behaviors and attitudes regarding food, nutrition, and obesity. Numerous studies have highlighted that university students often fail to maintain a balanced diet, which can result in adverse health outcomes and weight gain. (24)

A study conducted in the United States revealed that the understanding of obesity treatment among various medical professionals, including general practitioners, specialists, internal medicine residents, and medical students, was insufficient, with notable disparities in knowledge levels among these groups. (27) According to the World Health Organization (WHO), in 2016, over 340 million children and adolescents aged 5 to 19 were classified as obese. The prevalence of overweight or obese individuals in this age group increased more than fourfold from 1975 to 2016, rising from 4% to 18% on a global scale. This trend was consistent across genders, with 18% of girls and 19% of boys being classified as overweight in 2016. (28)

Conversely, the level of nutrition knowledge among students ranges from inadequate to acceptable. Previous research has indicated that a lack of understanding regarding healthy nutrition contributes to various unhealthy eating habits and obesity. (29) In contrast, a higher level of nutrition knowledge has been significantly linked to healthier eating practices, such as increased consumption of fruits, cereals, dairy products, and legumes. (22) Nevertheless, existing studies that have explored the connection between nutrition knowledge and eating behaviors have largely focused on specific food groups rather than comprehensive dietary indices.(23) Recent research has indicated a decline or stabilization in the prevalence of adolescent obesity in certain developed and European countries. (20) Given that trends in obesity prevalence can vary significantly across different countries and over time, it is essential to gather more data regarding the temporal trends of obesity among adolescents in Saudi Arabia. This information is crucial for formulating effective public health policies and intervention strategies aimed at timely management of obesity. Numerous prior studies have highlighted the association between obesity and its risk factors. (22)

Rationale:

One of the contributing factors to obesity among students is their eating habits, particularly the excessive consumption of instant processed foods, sugary beverages, and snack items such as fast food (including burgers, pizza, and hot dogs) readily available at various food outlets. Children who frequently indulge in unhealthy snacks that are high in calories, while neglecting adequate intake of fruits and vegetables as sources of fiber, are at a higher risk of developing obesity. Data indicates that a significant proportion of obese students (69.4%) consume fast food more than twice a week, in contrast to their peers with normal weight, who typically consume it only once or twice weekly. The high caloric content of fast food can lead to obesity when consumed in excess. Dieting serves as a method for regulating the quantity and type of food consumed, aimed at maintaining health, nutritional status, and preventing or managing dietary-related diseases. It is essential for every individual to ensure that their food intake supports bodily maintenance and provides necessary nutrients for growth.

The study aimed

To evaluation the effected of health education on knowledge and attitudes about diet for obesity prevention in students at Saudi Arabia 2024 .

Methodology Study design:

Cross-sectional design in the present study with Stratified Random Sampling

Study area and population:

The population in this study were students of the were listed as students in age <14 to above 16 with a total population of 300 students in Makkah region Saudi Arabia

Inclusion criteria

- Student's obesity.
- < 14 years and above than 16 years
- Both males and females.

Sample size:

The sample size was determined using the Raosoft Online sample size calculator. A total of 300 students were selected to assess obesity, based on the assumption that the prevalence over the past four weeks was 50%, with a confidence level of 95% and a margin of error of 5%. To account for potential dropouts and non-respondents, an additional 10% was included, resulting in an invitation extended to 300 students to participate in the study.

Sampling technique

The sampling technique used Proportionate Stratified Random Sampling with a total of 300 respondents . Thus, nearly 30 working days were needed to collect the sample

Data collection tool

A self-administered questionnaire was employed for the purpose of data collection, adapted from a prior study conducted in Saudi Arabia. Several modifications were made, and the revised format received validation from three experts in the fields of family medicine, endocrinology, and community medicine. The final version of the questionnaire is divided into two sections:

- The first section gathers socio-demographic and personal information about the participants.

- The second section examines factors associated with obesity, including physical activity and dietary habits. Additionally, an expert nurse calculated the body mass index (BMI).

Data collection involved a knowledge questionnaire consisting of closed-ended questions, as well as an attitude questionnaire utilizing a Likert scale for responses.

Data Collection technique .

- During the study period (during the Septmber to October, 2024), 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 carried out involving 20 patients, which constitutes roughly 10% of the total sample size. This study was conducted with a different group of students in Saudi Arabia, distinct from those participating in the main research, to evaluate the clarity of the questions and the practicality of the methodology. No changes were implemented based on the findings from the pilot study.

Ethical considerations

Approval from the research committee, documented consent from the joint program of family medicine in Saudi Arabia, written authorization from the relevant school authority in Saudi Arabia, and individual verbal consent from all participants prior to data collection were obtained. Acknowledgments were extended to all supervisors, advisors, assistants, facilitators, and participants. All data collected were maintained in a confidential manner.

Budget: Self-funded

3. Results

Table 1. Distribution of Socio-demographic characteristics of the studied participated (Age, Gender, Marital status, Level of education)(n-300)

	N	%
Age		
<14	87	29
14-16	90	30
More than 16	123	41
Sex		
Male	126	42
Female	174	58
Income level		
Below 5000 SR	93	31
5000 – 10000 SR	72	24
10,000 – 20,000 SR	60	20
Above 20,000 SR	75	25
Health condition		
Healthy	168	56
Having diabetes	51	17
Having heart disease	27	9

Having hypertension	33	11
High cholesterol	21	7
Sources of information about obesity		
Booklets and brochures	135	45
Mass media	69	23
Own personal experience	96	32
Educational films	120	40

Table 1 presents data indicating that the total number of participants was 300. Among these, the majority of participants aged over 16 constituted 41.0%, followed by those aged 14-16 at 30.0%, and those under 14 at 29.0%. In terms of gender, female participants represented 58.0%, while male participants accounted for 42.0%. Regarding income levels, 31.0% of participants reported earning below 5,000 SR, while 25.0% earned above 20,000 SR. Additionally, 24.0% fell within the 5,000-10,000 SR range, and 20.0% earned between 10,000-20,000 SR. Concerning health conditions, 56.0% of participants reported being healthy, while 17.0% had diabetes, 11.0% had hypertension, and 9.0% had heart disease. As for sources of information about obesity, 45.0% of participants cited booklets and brochures, followed by 40.0% who referred to educational films, and 32.0% who relied on personal experience, with mass media also accounting for 32.0%.

Table 2 illustrates the distribution of habitual factors associated with obesity among the studied participants.

	N	%
Do you have any complications from obesity?		
Yes	159	53
No	141	47
Smoking cigarette		
Smoker	39	13
Quit smoking	69	23
Non-smoker	192	64
BMI status		
Normal weight	186	62
Overweight	63	21
Obese	51	17

Table 2 presents the habitual factors associated with obesity. Among the participants, a majority reported experiencing complications related to obesity, with 53.0% answering affirmatively and 47.0% indicating they had no such complications. In terms of smoking status, 64.0% of participants identified as non-smokers, while 23.19% had quit smoking, and 13.0% were current smokers. Regarding Body Mass Index (BMI), 62.0% of participants were classified as having a normal weight, 21.0% were categorized as overweight, and 17.0% were identified as obese.

Table 3 Distribution of the attitudes (Physical activities) associated about the obesity prevention in students participated

	N	%
Physical activities or exercises		
No	186	62
Yes	114	38
If yes What is type of physical activities or exercises		
Walking	126	42
Running	87	29

Both	87	29
Do you stop aerobic exercise for two consecutive days or more per week?		
Always	207	69
Sometimes	69	23
No	24	8
Risk factor		
Asthma	75	25
High blood pressure	102	34
High fat and cholesterol	66	22
Emphysema or COPD	30	10
Other lung diseases Type of lung disease	39	13
Heart diseases	45	15
Arthritis or other rheumatic diseases	96	32

Table 3 presents the attitudes towards physical activities related to obesity prevention among students. More than half of the participants (62.0%) reported that they do not engage in physical activities or exercises, while 38.0% indicated that they do. Among those who do participate, walking was the most common activity, reported by 42.0% of the respondents, followed by running and a combination of both at 29.0%. When asked about the frequency of stopping aerobic exercise for two or more consecutive days each week, the majority of participants (69.0%) stated that they always stop, while 23.0% said they sometimes do, and 8.0% reported that they do not stop at all. In terms of risk factors, the most prevalent among participants was high blood pressure at 34.0%, followed closely by arthritis or other rheumatic diseases at 32.0%. Asthma was reported by 25.0% of participants, while high fat and cholesterol levels were noted by 22.0%, and heart diseases were mentioned by 15.0%. Other lung diseases accounted for 13.0% of the responses.

Table 4 Distribution of health education on knowledge and attitudes about diet for obesity prevention in students participated

Variable	**Favorable**		**Un favorable**		**Chi-square**	
	No	**%**	**No**	**%**	**X^2**	**P-value**
pay attention to the caloric value of the foods I eat	129	43	171	57	0.448	0.503
My food choices are determined by concern for my health	87	29	213	71	52.083	<0.001*
Thinking about food is a particular concern for me	147	49	153	51	0.083	0.772
A belief in healthy eating increases my self-esteem	159	53	141	47	0.963	0.326
Healthy eating influences my lifestyle	216	72	84	28	57.203	<0.001*
Eating healthy foods can improve my appearance	198	66	102	34	30.083	<0.001*
Attitude towards food and nutrition	186	62	114	38	61.004	<0.001*

Table 4 presents the distribution of health education concerning knowledge and attitudes about diet for obesity prevention among participating students. The findings indicate that attention to the caloric value of foods consumed showed no significant relationship (P-value = 0.503, X^2 = 0.448), with a majority of participants expressing unfavorable attitudes (57.0%) compared to those with favorable attitudes (43.0%). In terms of food choices being influenced by health concerns, a significant relationship was observed (P-value = 0.001, X^2 = 52.083), where the majority of participants reported unfavorable attitudes (71.0%) against those who were favorable (29.0%). Regarding the concern for food, no significant relationship was found (P-value = 0.772, X^2 = 0.083), with a near-even split in attitudes (unfavorable: 51.0%, favorable: 49.0%). The belief that healthy eating enhances self-esteem also showed no significant relationship (P-value = 0.326, X^2 = 0.963), with a majority of participants holding favorable views (53.0%) compared to unfavorable views (47.0%). Conversely, the perception that healthy eating influences lifestyle demonstrated a significant relationship (P-value = 0.001, X^2 = 57.203), with a majority of participants expressing favorable attitudes (72.0%) versus unfavorable (28.0%). Additionally, the belief that eating healthy foods can improve appearance revealed a significant relationship (P-value = 0.001, X^2 = 30.083), with 66.0% of participants holding favorable views compared to 34.0% who were unfavorable. Lastly, attitudes towards food and nutrition also indicated a significant relationship (P-value = 0.001, X^2 = 61.004), with 62.0% of participants expressing favorable attitudes and 38.0% unfavorable.

Table 5 Distribution of health education on knowledge about diet for obesity prevention in students participated

	Knowledge	
	N	**%**
Weak	171	57
Average	99	33
High	30	10
Total	300	100
X^2	99.42	
P-value	<0.001*	

P-value <0.001*

Table 5 regarding distribution of health education on knowledge about diet for obesity prevention in students the most of participant answer in weak knowledge were (57.0%) followed by average were (33.0%) while high were (10.05) while a significant relation were < P-value=0.001 and X2 99.42 while total were (100.0%) .

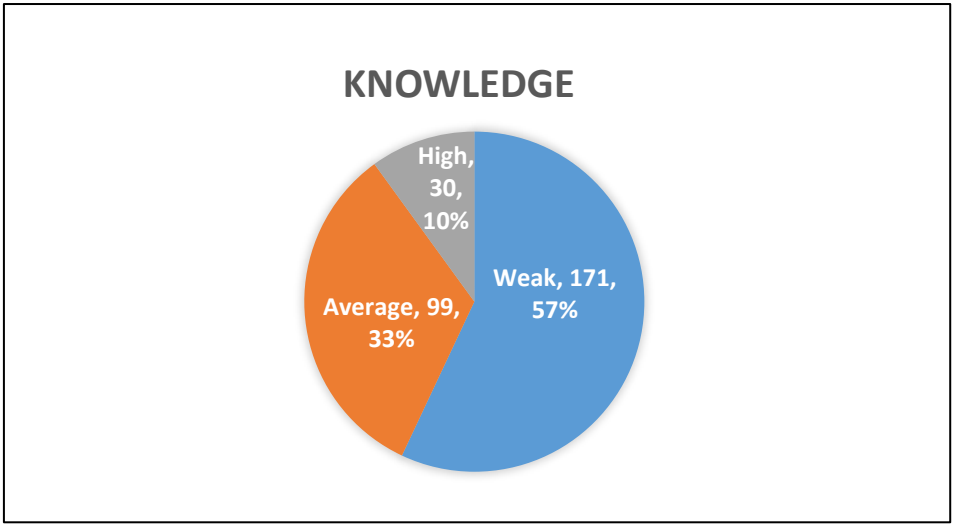

Figure 1 Distribution of health education on knowledge about diet for obesity prevention in students participated

Table 6 Distribution of health education attitudes about diet for obesity prevention in students participated

	Attitudes	
	N	**%**
Negative	189	63
Positive	111	37
Total	300	100
X^2	19.763	
P-value	<0.001*	

P-value <0.001*

Table 6 regarding distribution of health education attitudes about diet for obesity prevention in students the most of participant answer in negative attitudes were (63.0%) followed by positive were (37.0%) while total were (100.0%) while a significant relation were < P-value= 0.001 and X2 19.763

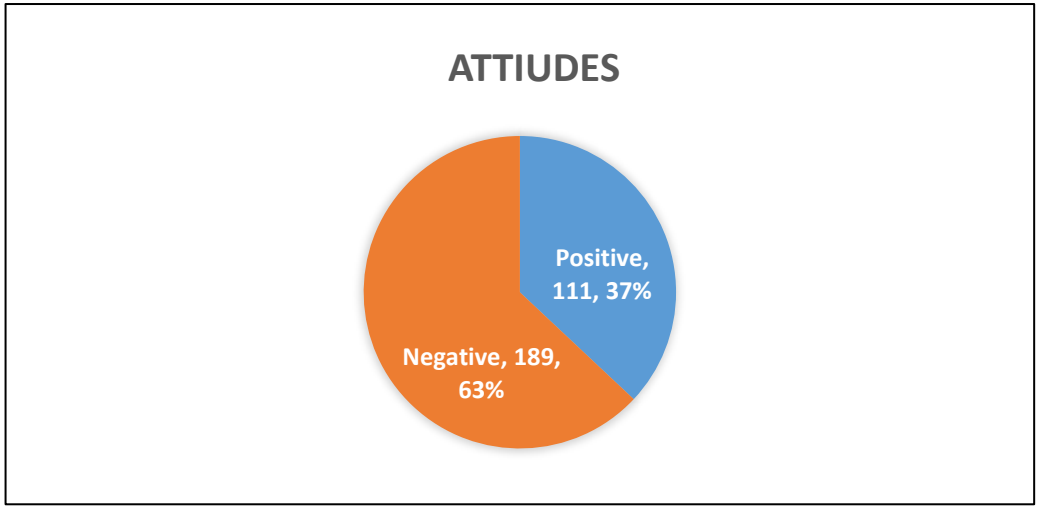

Figure 2 Distribution of health education on knowledge about diet for obesity prevention in students participated

4. Discussion

Knowledge is subject to various influences, with education being a significant factor that enhances an individual's understanding. Generally, individuals with higher educational attainment possess a more extensive knowledge base compared to those with lower educational levels. Knowledge can also be gained through various learning processes. Additionally, mass media and information sources, such as radio, television, newspapers, magazines, and books, play a crucial role in knowledge acquisition.

This study examined the impact of health education on knowledge and attitudes regarding dietary practices for obesity prevention among students in Saudi Arabia, utilizing a nationally representative sample. Notably, the prevalence of obesity among students has doubled since 2019, with a significant annual increase. Previous research indicates a rising trend in obesity rates in Saudi Arabia, particularly among boys, as evidenced by studies conducted since 2019. The results of this study reveal that the obesity prevalence among adolescents in Saudi Arabia contrasts with trends observed in several developed nations, where research has indicated stable or declining obesity rates. In comparison, studies tracking obesity trends among Chinese adolescents from 2015 have reported a decrease in obesity rates since 2011, which is not the case in Saudi Arabia.

In our research, the total number of participants was 300. Regarding age, the majority of participants over 16 years old constituted 41.0%. In terms of gender, female participants represented 58.0%. Concerning income levels, 31.0% of participants reported earnings below 5000 SR. As for health status, 56.0% of participants were classified as healthy. When examining

sources of information about obesity, 45.0% of participants indicated that they relied on booklets and brochures (See to Table 1).

Obesity and overweight are significant public health concerns among adolescent students, carrying considerable health, demographic, and socio-economic consequences. (28).The food environment has evolved over recent decades, leading to a dramatic increase in obesity and overweight rates in both developing and developed nations. The study also explored the factors associated with overweight and obesity, concluding that the prevalence of these conditions is notably high and is correlated with sedentary lifestyles, unhealthy eating patterns, and restricted dietary diversity. (25).

The prevalence of overweight and obesity was found to be lower than what is typically reported in existing studies. (29) While this prevalence aligns with findings from other studies, it exceeds the rates observed among preschool students in a cross-sectional study conducted across twenty-six African nations. Numerous studies indicate that urban students, benefiting from more favorable environmental and socio-economic conditions, generally exhibit better nutritional status compared to their rural peers. (30) A similar investigation focusing on rural adolescents in Saudi Arabia would be essential to either support or challenge this hypothesis. Additionally, another survey indicated that the prevalence of overweight and obesity was higher among girls than boys, which is consistent with findings from low- and middle-income countries. Conversely, in high-income nations, the trend is reversed, with boys exhibiting higher rates of overweight and obesity than girls. (31)

This study has shown an increase in the level of physical activity among the Saudi population, although it remains relatively low. The World Health Organization reports that approximately 30% of the global population, and between 30% to 70% of individuals in the eastern Mediterranean region, do not achieve the recommended minimum levels of physical activity. (2).The Saudi STEPwise survey revealed that 32.3% of Saudis aged 15 to 64 years engage in moderate to high levels of physical activity. (30).

In our study regarding distribution of the attitudes (Physical activities) associated about the obesity prevention in students show the physical activities or exercises more than half of the participants (62.0%), if yes What is type of physical activities or exercises the majority of the participants walking were (42.0%), you stop aerobic exercise for two consecutive days or more per week the majority of the participants always were (69.0%) (See table 3)

According to Kriswanto (2014) "Health Education is the process of helping a person, by acting individually or collectively, to make decisions based on knowledge about matters that affect their personal health and that of others to increase the ability of the community to maintain their health and not only bind themselves in increasing knowledge, attitudes and practices, but also improving or improving the environment (both physical and non-physical) in order to maintain and improve health with full awareness[33] ."

in our study regarding distribution of health education on knowledge about diet for obesity prevention in students the most of participant answer in weak knowledge were (57.0%) followed by average were (33.0%) while high were (10.05) while a significant relation were < P-value=

0.001 and X2 99.42 while total were (100.0%) .(See table 5)

Tadesse et al (2017) reported defined attitude as an individual's closed reaction to a specific stimulus or item that already incorporates the relevant opinion and emotion variables. Personal experience, the impact of other individuals who are seen as important, cultural influences, mass media, educational institutions, religious organizations, and societal variables are all factors that affect views,(32) in our study regarding distribution of health education attitudes about diet for obesity prevention in students the most of participant answer in negative attitudes were (63.0%) followed by positive were (37.0%) while total were (100.0%) while a significant relation were < P-value= 0.001 and X2 19.763 (See table 6)

5. Conclusion

Obesity is increasingly recognized as a widespread health issue globally. Current estimates suggest that approximately 350 million individuals are classified as obese or overweight worldwide. Over the past three decades, the incidence of obesity among students has surged, particularly in developed nations such as Saudi Arabia, where there is a growing emphasis on health education. This research aims to serve as a foundational lesson, encouraging Saudi students to engage more deeply in counseling courses. Such training will enable them to offer effective guidance in their communities. Furthermore, it is anticipated that collaborative programs with local health centers will be established to consistently deliver health education focused on promoting healthy eating habits and preventing obesity among students on an annual basis. Students who participate in health education initiatives are expected to maintain healthier dietary practices to mitigate the risk of obesity. Additionally, the findings of this study are intended to provide essential data for future researchers, offering insights that can inform subsequent studies and encouraging the exploration of new research variables alongside those already established.

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