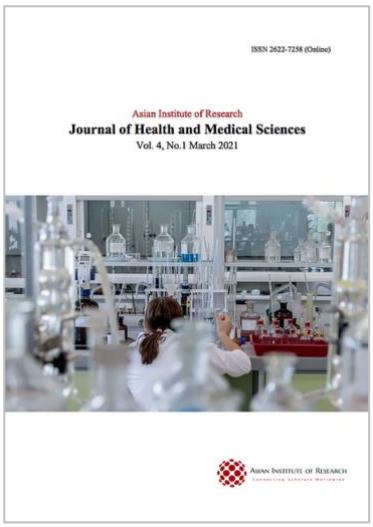

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Knowledge, Perception, Behavior and Practice Among University Students of Public Health Towards Obesity

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Abstract
Background: Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk factor to health. A crude population measure of obesity is the body mass index (BMI), which is used to classify weight status, overweight is the person with a BMI of 25 or more, while a person with a BMI equal to or more than 30 is considered obese. Objectives: The aim of the study was to assess public health students' perception on obesity &overweight health risks, clarify students' knowledge, behaviors and practices that increases risks of obesity and obesity-related diseases. Methods: A cross-sectional study was conducted to evaluate students Knowledge, Perception, Behavior and Practices towards obesity among students of public health in Umm Al-Qura University, in which 50% of students (136)were randomly selected using stratified sampling technique. Results: The study clarified that (69.9%) of students understand BMI-obesity relationship, while (30.9) didn't know, the study showed that among 136 students,124 (91.2%) understand obesity -diabetes mellitus type 2 relationships. Likewise, 112 (82.4%) understand the relationship between obesity and hypertension. The study found that out of 136 students (72.8%) are aware that obesity is a risk factor for sleep apnea, referring t student's practice of physical activity, study clarified that only 69.9%of students were practicing physical activity. Conclusion: The study concluded that there was a weakness in the perception and knowledge of students on BMI, study recommended for more concentration in academic activities to change this perception. The study concluded that the knowledge of students on major risk factors of obesity, relations of obesity with diabetes mellitus type 2, hypertension, sleep apnea, physical activity and weight control where acceptable. According to the study there were a problem in monitoring blood glucose and hypertension among overweight and obese students, which may be reflected in other health problems in the future. Recommendations: The study recommends for the introduction of extra educational and non-curricula programs on lifestyle, nutrition and obesity for public health student's, establishment of regular physical activities programs and strengthening of health education programs on overweight, obesity and other associated health problems inside and outside university campus. The study recommends for more researches to evaluate knowledge, perception, practice among public health and other students towards obesity.

Keywords: Obesity, Public Health Students

Introduction

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. A crude population measure of obesity is the body mass index (BMI), a person's weight (in kilograms) divided by

the square of his or her height (in meters). A person with a BMI of 30 or more is generally considered obese. A person with a BMI equal to or more than 25 is considered overweight. Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases and cancer. Once considered a problem only in high-income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries, particularly in urban settings (WHO, 2019).

Obesity is a complex disease involving an excessive amount of body fat. Obesity isn't just a cosmetic concern. It is a medical problem that increases your risk of other diseases and health problems, such as heart disease, diabetes, high blood pressure and certain cancers. There are many reasons why some people have difficulty avoiding obesity. Usually, obesity results from a combination of inherited factors, combined with the environment and personal diet and exercise choices. The good news is that even modest weight loss can improve or prevent the health problems associated with obesity. Dietary changes, increased physical activity and behavior changes can help you lose weight. Prescription medications and weight-loss procedures are additional options for treating obesity (MOH, 2013).

Obesity and Overweight are defined as an increase in body mass, particularly fatty mass, which is caused by an imbalance between the energy consumed from food. The body consumes energy, and the World Health Organization defines (overweight) as the condition in which the body mass index is between 25 kg / m2 to 29.9 kg / m2, and (obesity) is defined as the case where the body mass index is more than 30 kg / M 2. More than 1.4 billion adults are overweight, more than half a billion are obese globally, and more than 40 million children under the age of five are overweight worldwide, according to WHO reports. Reports also show that the rate of obesity has doubled from 1980 to 2008 globally. Obesity has taken on epidemic proportions around the world, with it, and overweight, standing behind the deaths of at least 2.6 million people every year (Mayo Clinic, 2019).

Objectives

1. To assess students' perception on obesity& overweight and their health risks.
2. To clarify students' knowledge about Obesity-related diseases.
3. To assess the availability of health education materials on obesity.
4. To clarify behaviors and practices increasing risks of Obesity.

Literature Review

Obesity is regarded as a significant public health issue, which has raised a concern globally. The WHO claims that, obesity has more than doubled worldwide, since 1980. More than 1.9 adults were overweight, in the year 2014, including over 600 million obese individuals. 39% of the adults were overweight and 14% were obese. Moreover, it is found that 41 million children (under age 5) around the world in 2014 were either overweight or obese. Previous studies have revealed that obesity is among the major cause of co-morbidities, including cardiovascular diseases, diabetes, cancers, and the related issues that may lead to morbidity and mortality. In most of the countries, the high total obesity and overweight cost represents a relative economic burden on the GDP. Over the last decade, the prevalence of obesity has increased significantly in several developed and developing countries. The current research paper focuses on obesity in Saudi Arabia, which has now one of the highest obesity and overweight prevalence rates (Imedpub, 2016).

Sabra examine obesity among female nursing students in Dammam, Saudi Arabia using waist to hip ratio (WHR) and body mass index (BMI). The study collected data with the help of an interviewer-administered questionnaire, from a sample of 260 female nursing students. The results of the study indicate the dietary pattern and life style, according to which 71.5% of the respondents do not share family members in their meals, 46.9% watch television while eating, and 35.7% take snacks as their main eating pattern. In addition, 82.7% of the students consume fast/junk food 1 to 6 times/week and 73.1% consume soft drinks more than 7 times/week. According to the BMI results, almost half of the

students (51.5%) have normal weight; and 23.1% and 3.8% are overweight and obese respectively. It is also found that 19.2% of the respondents are underweight. 33% have abnormally unacceptable WHR, which is more prevalent among those who are found overweight by BMI. It is also observed that family history is significantly associated with prevalence of obesity in female nursing students Imedpub, 2016).

It is argued that data on obesity-related to Kingdom of Saudi Arabia (KSA) is non-existent, which restrained evaluation of government efforts in controlling obesity trends in the country. In this regard, Memish et al. conducted a national survey to examine obesity and its associated factors in KSA; and in the process, interviewed 10,735 individuals aged 15 years and older. The research collected data regarding physical activities, diet, health-related behaviors and habits, socio-demographic characteristics, anthropometric measurements, use and access to healthcare, and chronic diseases of the respondents using computer-assisted personal interviews. The results reveal that 28.7% of the total respondents are obese, with a BMI greater than 30 kg/m2, which is more prevalent among women (33.5%) than men (24.1%). Obesity, among men is associated with diet, marital status, hypertension, hypercholesterolemia, diagnoses of diabetes, and physical activity. Among women, it is related with education, marital status, hypertension, and chronic diseases' history (Imedpub, 2016).

In many developing societies, high caloric intake, decreased physical activity, and adoption of western lifestyle are contributing toward the prevalence of obesity. In addition, genetic factors also influence obesity and are related to BMI. Obesity has become an epidemic at global level, and widely regarded as a public health problem. Due to its related diseases, it is considered as major concern in KSA and other gulf states. In the context of KSA, examine association between obesity (BMI), fat mass and obesity-associated gene (FTO), glucose, and other metabolic-related traits. The study uses data of 186 female preparatory students of a university, and finds that one-third of the students have a high glucose level (HGL), and one-tenth are non-obese. Moreover, 50% of the students with Tallele have heterozygous FTO (Imedpub, 2016).

According to Horaib et al., obesity is a heritage of modernization of society. It involves faulty dietary habits, unhealthy food, less physical activity, and increased stress. In the Middle Eastern countries, these changes are drastic in the last four decades. The daily per capita consumption, during this period, has increased by 143.3% in the KSA. Moreover, the consequences are evident with the significant increase in prevalence and incidence of lifestyle-related diseases, which include ischemic heart diseases, diabetes, and hypertension [10], in the context of obesity, conducted a nationwide study and covered all five KSA military regions. Using a random (multistage stratified) sample of 10,229 military personnel, the research finds that 40.9% of the respondents are overweight; 42% have central obesity and 29% are obese. On the basis of multivariate analysis, results reveal that education years, age, and family history (Imedpub, 2016).

What are obesity and overweight?

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m^2) (WHO, 2018).

Body mass index:

The body mass index (BMI) is used to classify individuals as underweight normal weight, overweight, or obese in this report. The BMI is a unit of measurement that describes an individual's weight in relation to height, and is calculated by dividing weight in kilograms by the square of the height in meters (kg/m2).

For adults, WHO defines overweight and obesity as follows:

1. Overweight is a BMI greater than or equal to 25.
2. Obesity is a BMI greater than or equal to 30.

BMI provides the most useful population-level measure of overweight and obesity as it is the same for both sexes and for all ages of adults. However, it should be considered a rough guide because it may not correspond to the same degree of fatness in different individuals (Imedpub, 2016).

For children under 5 years of age:

1. Overweight is weight-for-height greater than 2 standard deviations above WHO Child Growth Standards median; and
2. Obesity is weight-for-height greater than 3 standard deviations above the WHO Child Growth Standards median.

Children aged between 5–19 years

1. Overweight is BMI-for-age greater than 1 standard deviation above the WHO Growth Reference median.
2. obesity is greater than 2 standard deviations above the WHO Growth Reference median (WHO, 2018).

What causes obesity and overweight?

The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally, there has been:

1. An increased intake of energy-dense foods that are high in fat.
2. An increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization.

Changes in dietary and physical activity patterns are often the result of environmental and societal changes associated with development and lack of supportive policies in sectors such as health, agriculture, transport, urban planning, environment, food processing, distribution, marketing, and education (WHO, 2018).

Overweight is a significant contributor to health problems. It increases the risk of developing a number of diseases including:
Type 2 (adult-onset) diabetes high blood pressure (hypertension), Stroke (cerebrovascular accident or CVA), Heart attack (myocardial infarction or MI), Heart failure (congestive heart failure), Cancer (certain forms such as cancer of the prostate and cancer of colon and rectum), Gallstones and bladder disease (cholecystitis), Gout and gouty arthritis, Osteoarthritis (degenerative arthritis) of the knees, hips, and the lower back, Sleep apnea (failure to breath normally during sleep, lowering blood oxygen), Pickwickian syndrome (obesity, red face, under ventilation, and drowsiness) (Medicine net, 2017).

Risk factors for obesity:

Obesity usually results from a combination of causes and contributing factors, including:

Family lifestyle. Obesity tends to run in families. If one or both of your parents are obese, your risk of being obese is increased. That's not just because of genetics. Family members tend to share similar eating and activity habits.

Inactivity. If you have a sedentary lifestyle, you can easily take in more calories every day than you burn through exercise and routine daily activities. Looking at computer, tablet and phone screens is a sedentary activity. The number of hours you spend in front of a screen is highly associated with weight gain.

Unhealthy diet. A diet that's high in calories, lacking in fruits and vegetables, full of fast food, and laden with high-calorie beverages and oversized portions contributes to weight gain.

Medical problems. In some people, obesity can be traced to a medical cause, such as Prader-Willi syndrome, Cushing syndrome and other conditions. Medical problems, such as arthritis, also can lead to decreased activity, which may result in weight gain.

Certain medications. Some medications can lead to weight gain if you don't compensate through diet or activity. These medications include some antidepressants, anti-seizure medications, diabetes medications, antipsychotic medications, steroids and beta-blockers.

Social and economic issues. Research has linked Social and economic factors to obesity. Avoiding obesity is difficult if you don't have safe areas to exercise. Similarly, you may not have been taught healthy ways of cooking, or you may not have money to buy healthier foods. In addition, the people you spend time with may influence your weight — you're more likely to become obesity if you have obese friends or relatives.

Age. Obesity can occur at any age, even in young children. But as you age, hormonal changes and a less active lifestyle increase your risk of obesity. In addition, the amount of muscle in your body tends to decrease with age. Generally, lower muscle mass leads to a decrease in metabolism. These changes also reduce calorie needs, and can make it harder to keep off excess weight. If you don't consciously control what you eat and become more physically active as you age, you'll likely gain weight.

Pregnancy. Weight gain is common during pregnancy. Some women find this weight difficult to lose after the baby is born. This weight gain may contribute to the development of obesity in women.

Quitting smoking. Quitting smoking is often associated with weight gain. And for some, it can lead to enough weight gain that the person becomes obese. In the long run, however, quitting smoking is still a greater benefit to your health than is continuing to smoke.

Lack of sleep. Not getting enough sleep or getting too much sleep can cause changes in hormones that increase your appetite. You may also crave foods high in calories and carbohydrates, which can contribute to weight gain.[7]

Obesity worldwide

Worldwide obesity has nearly tripled since 1975, in 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese, 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese, Most of the world's population live in countries where overweight and obesity kills more people than underweight, 41 million children under the age of 5 were overweight or obese in 2016, Over 340 million children and adolescents aged 5-19 were overweight or obese in 2016 and Obesity is preventable (WHO, 2018).

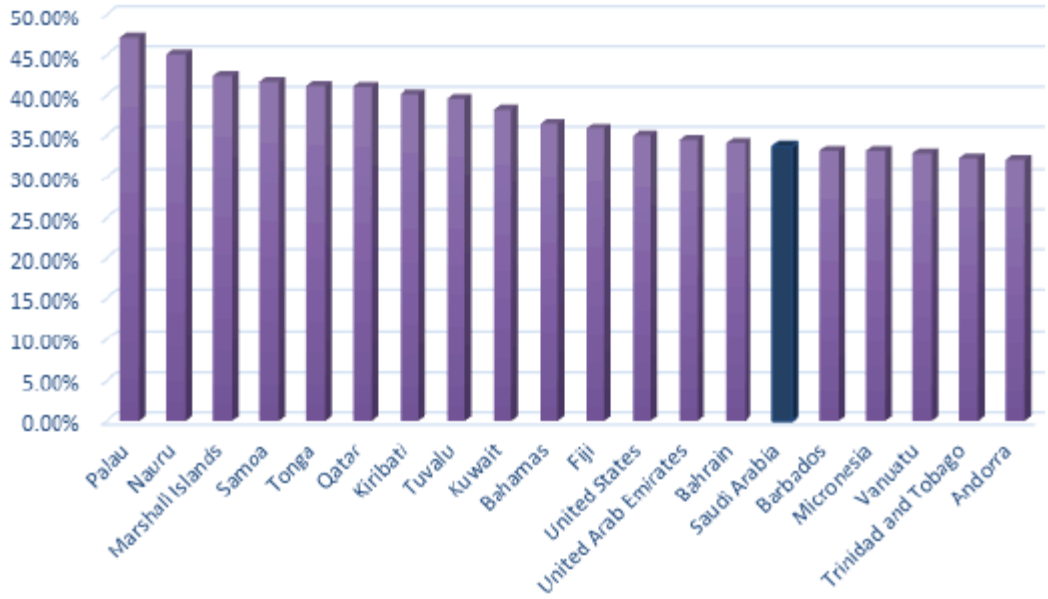

Figure 1: World Obesity Rates. The figure shows that Saudi Arabia is the world 15th most obese country, with an overall obesity rate of 33.7%

The prevalence of obesity, over the past 3 decades, has increased in many countries around the world. It is defined by a 30 or higher body mass index (BMI). The problem of obesity extends globally as estimated by the WHO. In 2008, worldwide 1.5 billion adults were overweight, where nearly 300 million women and over 200 million men were obese. However, across different nations, the prevalence of obesity varies, ranging from below 5% in Japan, China, Indonesia, India, and certain African countries to over 75% in Nauru and Samoa. In addition, childhood obesity is also on the rise globally, and an epidemic in some countries. Worldwide, 22 million children approximately, under age 5, are estimated to be overweight. Obesity prevalence has also increased dramatically among children aged 6-17 years, which is extending into the developing world from the developed nations. The rising trend, as indicated by international data, is not confined to the developed world, and it is predicted that by 2030, a majority of adult population of the world would be either obese or overweight (Imedpub, 2016).

In the rise of obesity and overweight, the interaction of a number of factors is contributing, which include metabolic, genetic, environmental, and behavioral influences. According to Mahmoud and Arulkumaran, the rapid growth in the rate of obesity is directly contributed by environmental and behavioral factors, rather than the biological factors. Moreover, racial or ethnic differences, consumption pattern, and lifestyle also influence the rate of obesity. For instance, as compared to rural areas, people in urban areas have higher obesity rate, possibly due to consumption of high-fat diets and more sedentary lifestyles. For daily living, the amount of energy spent has also reduced over the years, which also promotes obesity. Obesity is also often associated with high socio-economic status; as populations in the developed world are mostly affected by obesity (Imedpub, 2016).

Obesity in Saudi Arabia

Over the past 3 decades, the prevalence of overweight and obesity has increased dramatically worldwide. The rising trend of obesity indicates that this increase is not only confined to the developed world, but also extending towards the developing world. In the context, Saudi Arabia is now among the nations with the highest obesity and overweight prevalence rates due to a number of factors.

Over the past few decades, Saudi Arabia has become increasingly westernized, and now it has one of the highest obesity and overweight prevalence rates. Obesity in the county is a major cause of concern, where 7 out of 10 people are experiencing the problem. Previous studies related to prevalence of obesity in the Kingdom of Saudi Arabia (KSA) indicate an increasing trend in obesity and overweight, which are major sources of a number of other diseases, including hypertension, diabetes, obstructive sleep apnea, hyperlipidemia, and osteoarthritis (Imedpub, 2016).[9]

The rapid change in diet, lack of physical activity and lifestyle has led to an increase in the number of obese and overweight people in Saudi Arabia. Statistics from the World Health Organization show that the prevalence of obesity in the GCC is among the highest in the world. Obesity in the Kingdom of Saudi Arabia 28.7%, and the proportion of overweight 30.7% in the age group of 15 and above men and women, according to the results of the National Health Information Survey in 2013. Obesity is 9.3% among school-age children and 6% among preschool-age children, due to the high rate of obesity in Saudi Arabia and its association with many non-communicable diseases such as diabetes, heart disease, stress, arthritis Cancer, and other diseases, programs had been developed by the Ministry of Health to combat obesity (MOH Saudi Arabia, 2013).

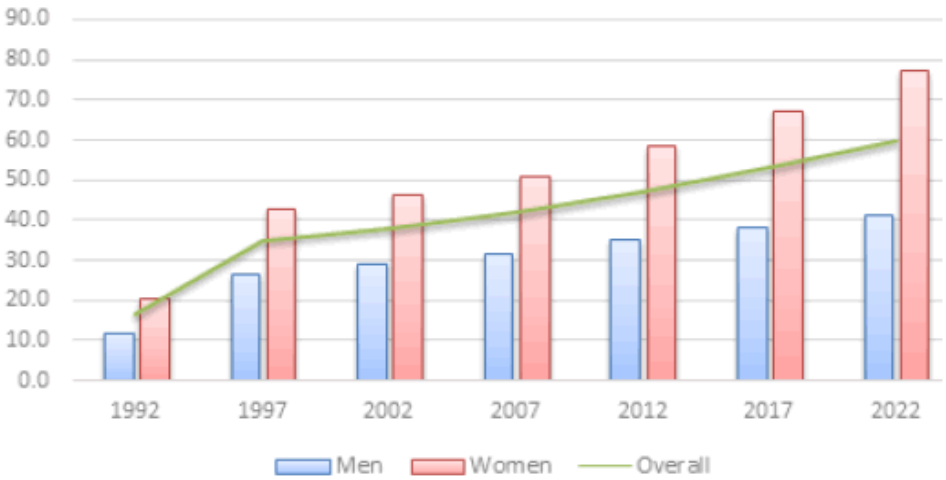

Figure 2: Obesity Prevalence % (1992-2022). As indicated earlier, the current research paper adopts a qualitative approach and follows a review-design to explore the research problem; i.e. to examine the prevalence of obesity in KSA, and explain its causes and consequences, the study performed a detailed literature review. The following table represents a summary of the reviewed studies in order to highlight and discuss the key statistics and findings

Methodology

Study area:

The study was conducted in the faculty of public health and health informatics, Umm Al-Qura University in Makkah city.

Study population:

All of public health students in the college.

Study design:

Cross-sectional study design used to evaluate the knowledge, perception, behavior and practice among students of public health towards obesity.

Sample size:

Sample size determined by selecting 50% of public health students at faculty of public health using stratified sampling technique in which 136 students participated in the study.

Inclusion criteria:

All students of public health at Umm Al-Qura University, Makkah city.

Exclusion criteria:

All females and internship students excluded.

Data collection and interpretation:

The data has been collected through questionnaire and interpreted using SPSS program.

Ethical issues:

Ethical clearance was obtained from the ethical committee of faculty of public health.

Results

Table.1. Number of respondents according to department& educational level

student department * education level Cross tabulation					
Count					
		education level			Total
		second level	3rd level	4th level	
student department	Health Promotion Department	10	11	11	32
	Environmental Health Department	10	9	9	28
	Epidemiology Department	11	13	15	39
	Health Informatics Department	9	15	13	37
Total		40	48	48	136

Stratified sampling technique used to select students from four departments

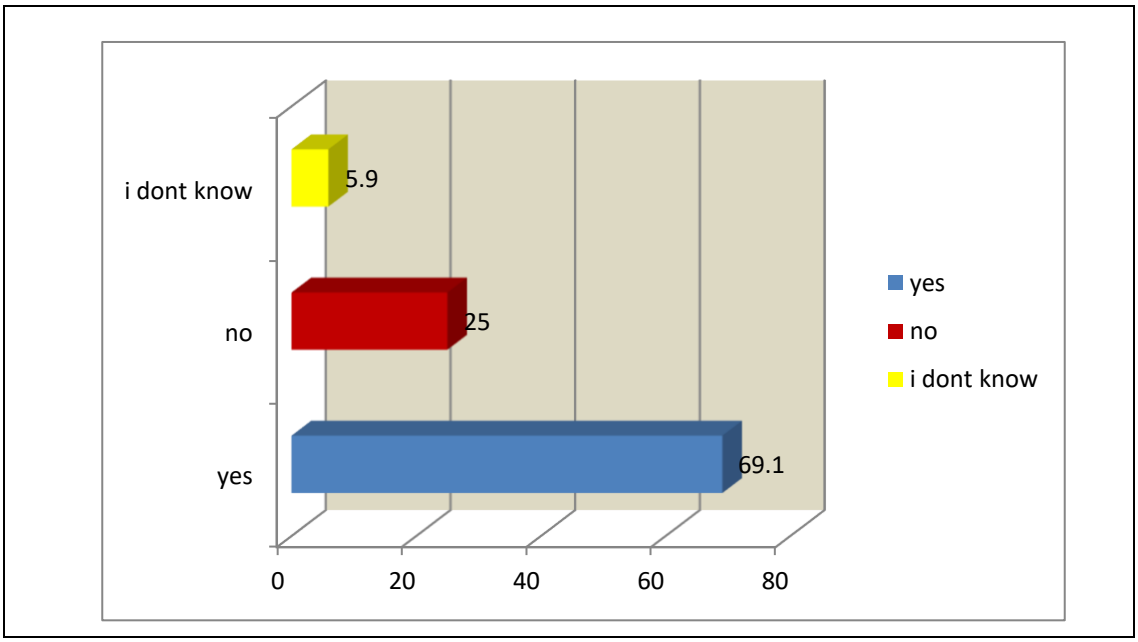

Figure 3: Perception of students on BMI, relation with obesity

69.1 of students knows what the mean of BMI, while 30.9 don't know.

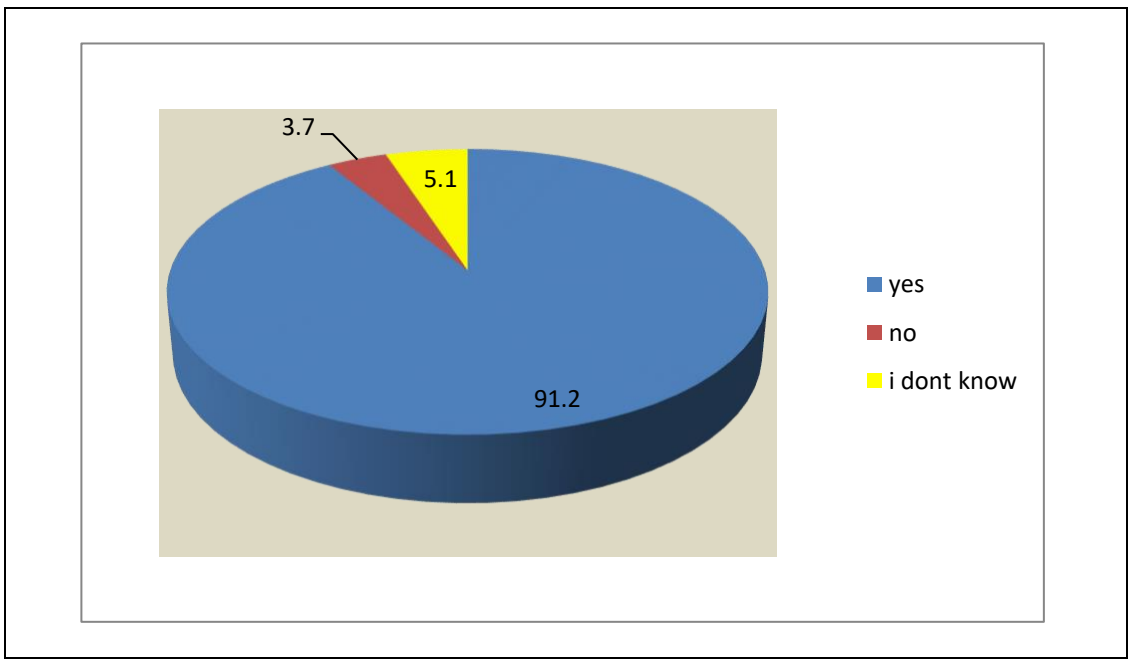

Figure 4: Knowledge of students on relations between obesity and diabetes Mellitus type 2

Majority of students (91.2%) knows relationship between obesity and diabetes type 2.

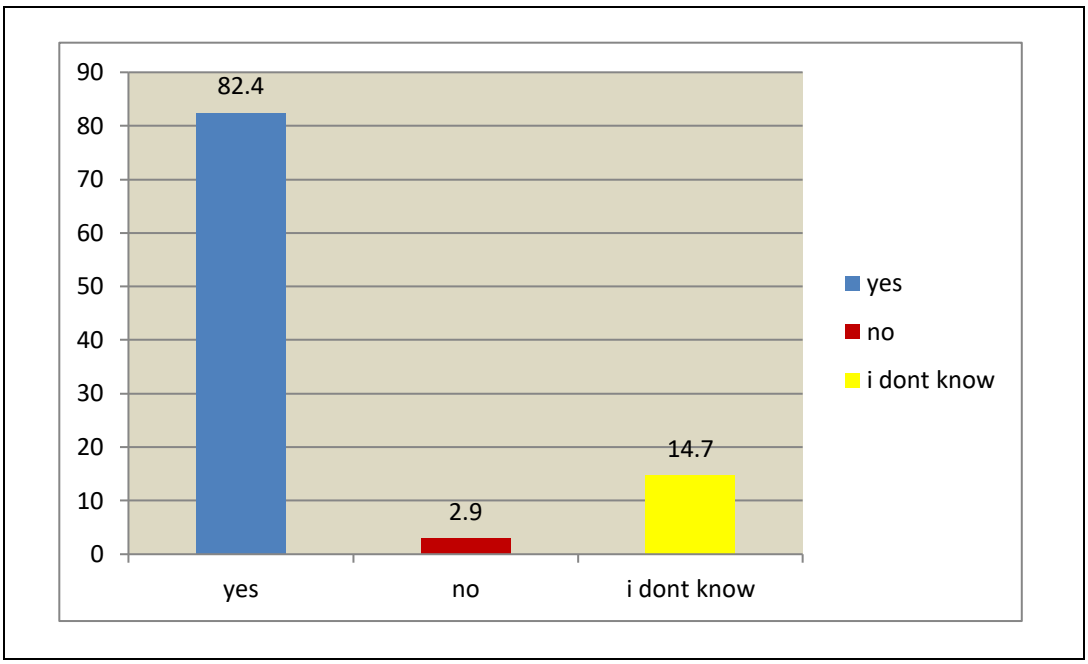

Figure 5: Students understanding on obesity-hypertension relationship

Majority of students understands obesity-hypertension relationships.

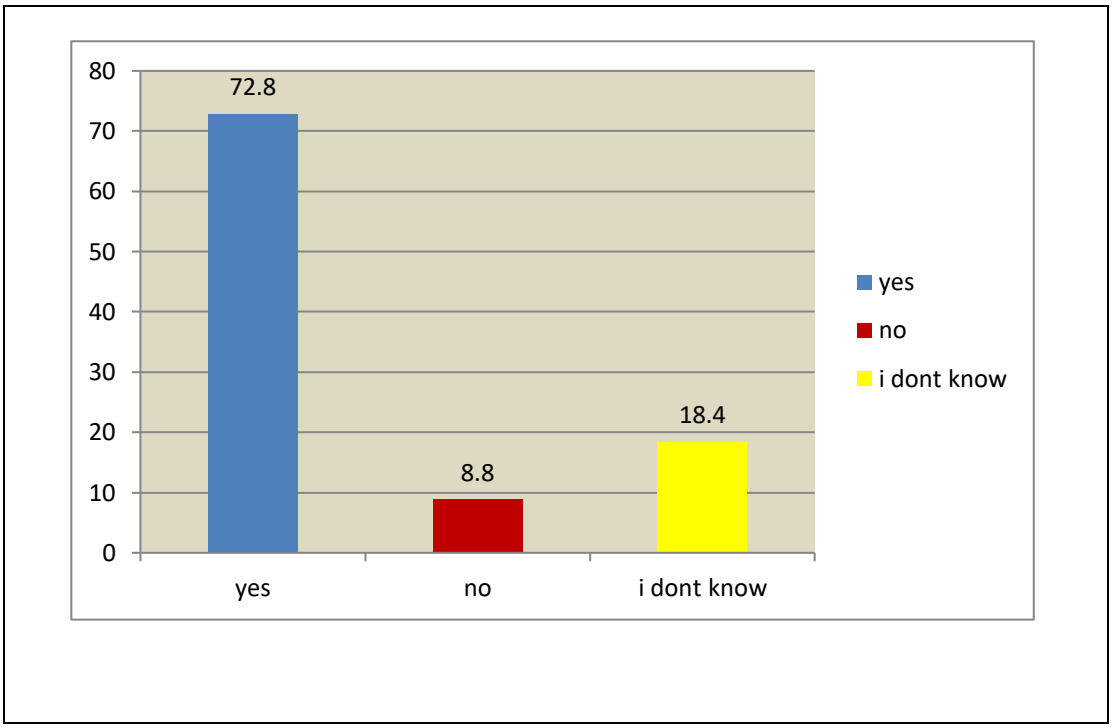

Figure 6: Knowledge of students on obesity- sleep apnea relationship

Most of students (72.8) are aware that obesity is a risk factor for sleep apnea.

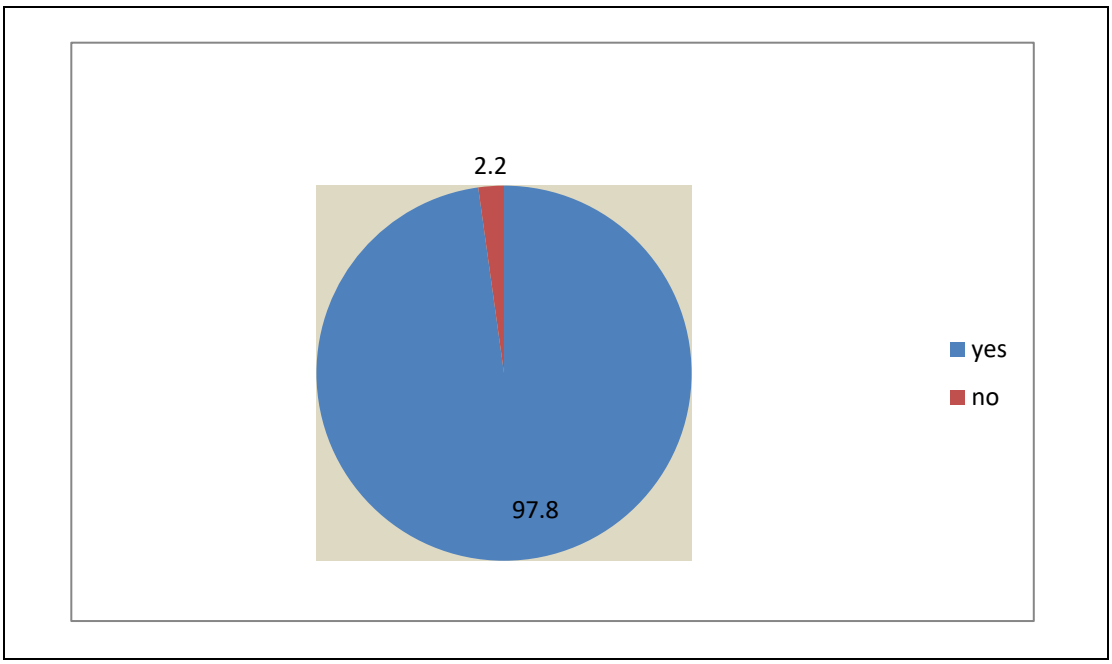

Figure 7: Physical activity and weight control

Showing perception of students on physical activity and weight control relations.

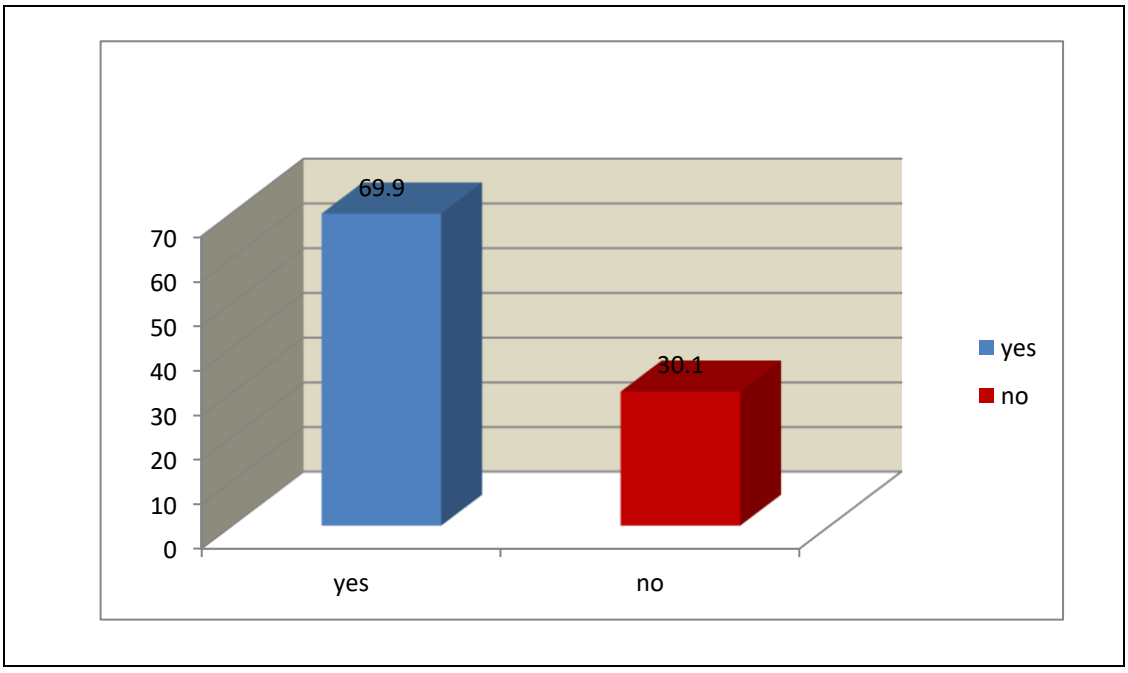

Figure 8: Student's practice of physical activity

(69.9%) of students practicing physical activity.

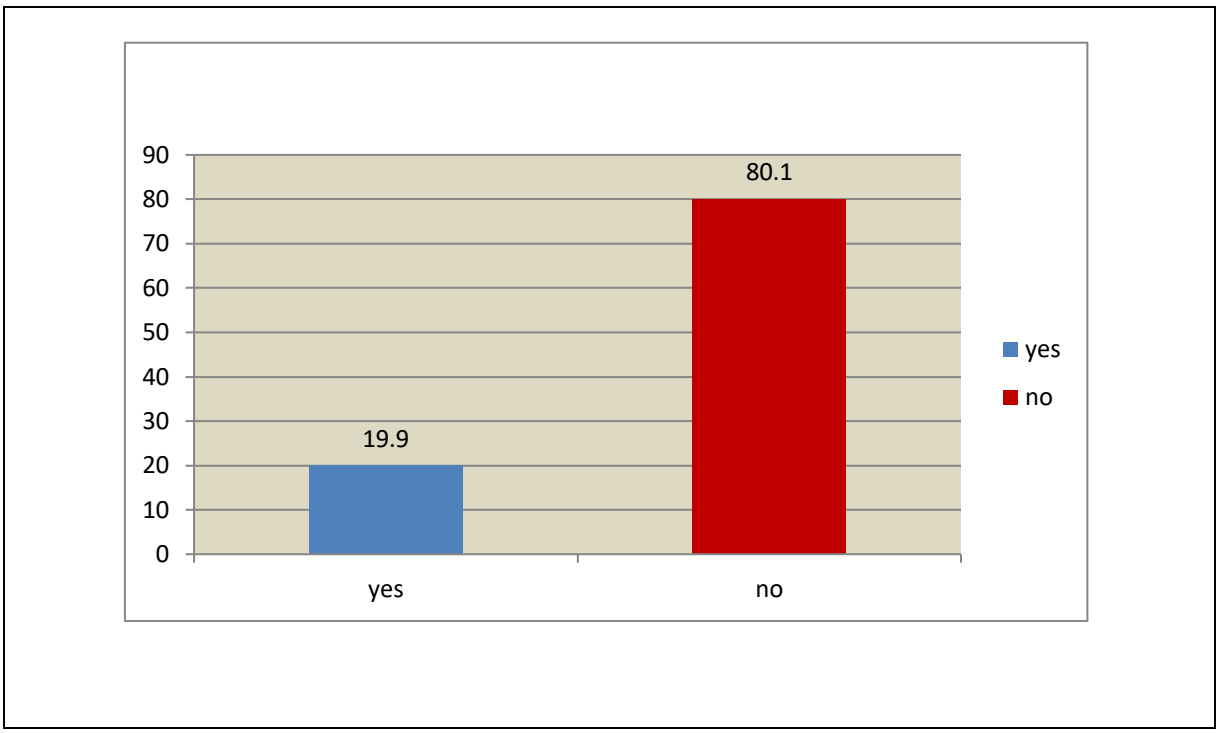

Figure 9: Knowledge of students on the importance of monitoring daily calories

The majority of students (80.1) do not monitor their daily calories.

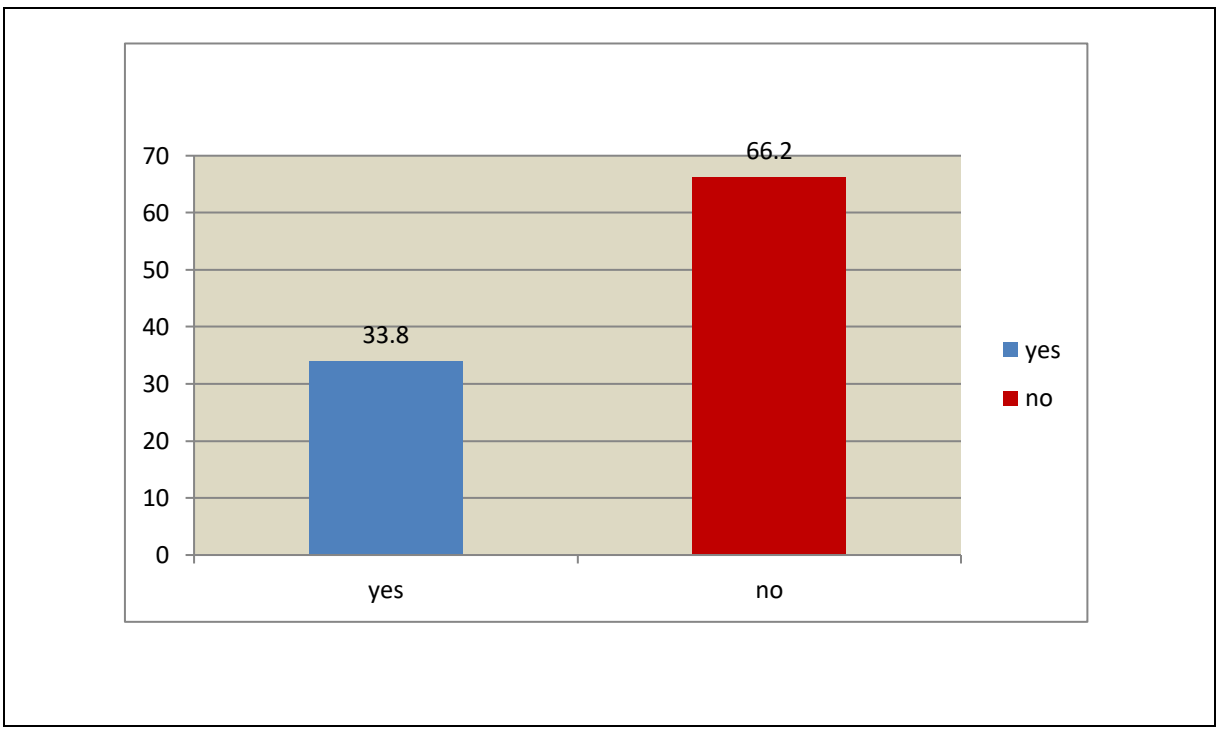

Figure 10: Monitoring of blood glucose among overweight or obese students

(66.2) of those students do not monitor their blood glucose, while (33.8) do.

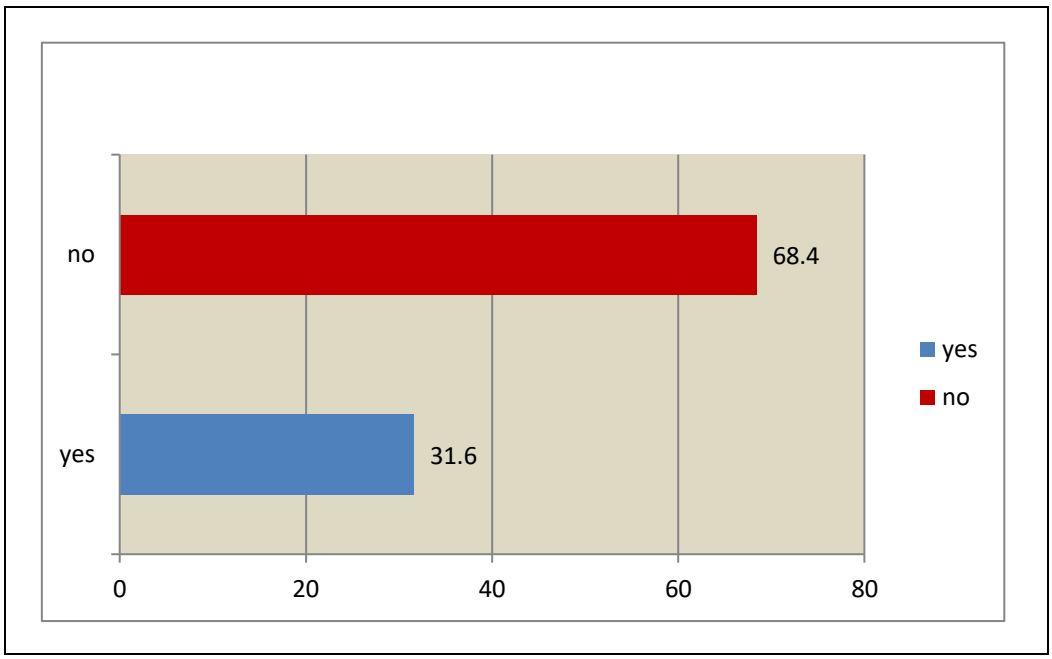

Figure 11: Monitoring of blood pressure levels among overweight or obese students

Large numbers of overweight or obese students (68.4) do not monitor their blood pressure.

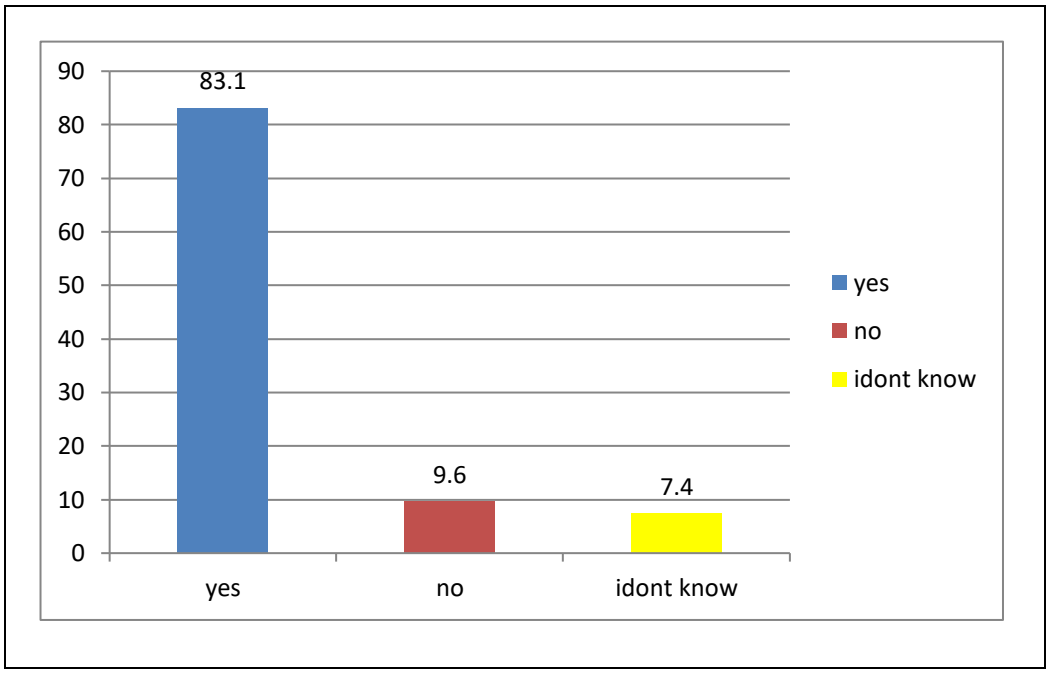

Figure 12: Public health students should be models and maintain normal weight

Showing attitudes of Public health students towards being with normal body weight.

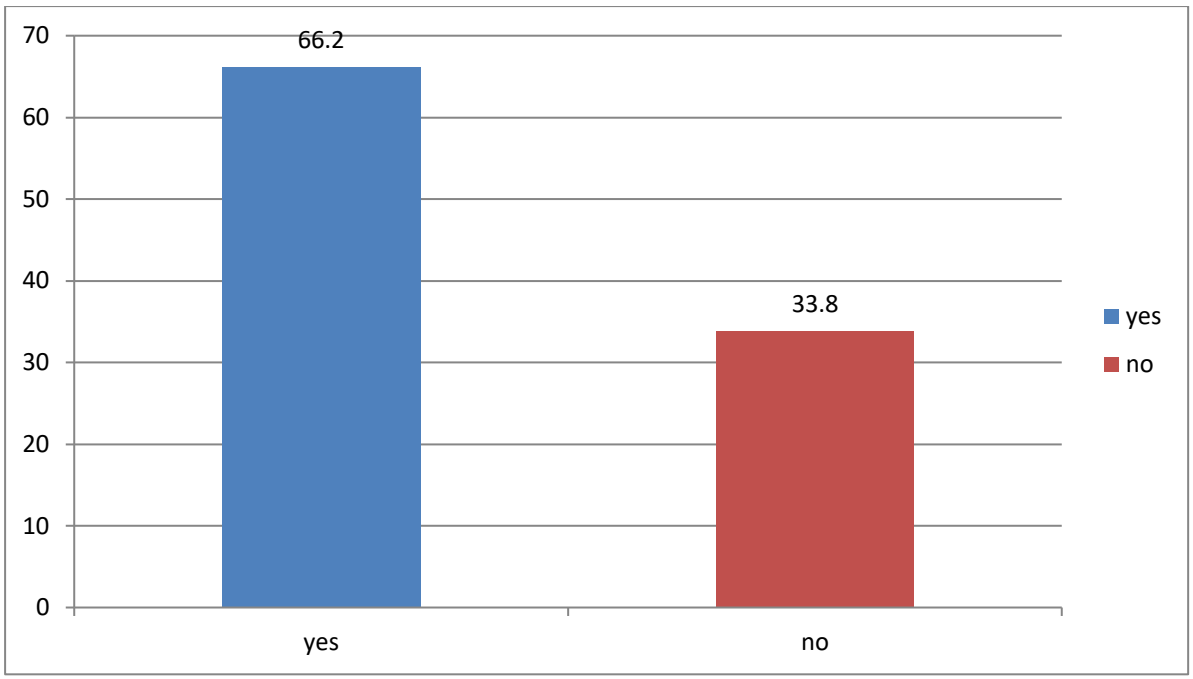

Figure 13: Knowledge of students about health education material on obesity

Two-thirds (66.2%) of students has come across health education material.

Discussion

The cross-sectional study was designed to assess knowledge, perception, behavior, and practice among students of public health in Umm Al-Qura University towards obesity and overweight. Obesity and overweight remains one of the major risk factors for many non-communicable diseases, where students of public health considered as a part of the major components in the fight against obesity and overweight. Body mass index (BMI) is recommended by the WHO to classify obesity and is used as a tool to identify patients or individuals at risk for adverse health outcomes. Referring to perception of public health students on BMI, (69.9%) of students understand BMI-obesity relationship, while (30.9) didn't know, this result agrees with the study of Lakshmi Sivashunmugam, Reshma M Ansari, which identified gaps in the knowledge and poor perception among medical students (Ansari, 2017).

The study shows that majority of students (91.2%) knows the relationship between obesity-diabetes mellitus, obesity-hypertension (82.4%), in addition to that most of students (72.8%) aware of obesity-sleep apnea relationship. The perception of students on weight control through physical activity is positive, where (97.8%) understand this relation. Referring to public health students practice, approximately (70%) have a physical activity, while (30%) are not practicing any type of these activities although they understand the importance of it in the prevention of obesity, this agrees with the study of Martins, Catia, Norsett-Carr, anette which revealed that medical students trust their acquired knowledge, but feel pressured by time constraints and the complexity of lifestyle issues and experience barriers to long-term follow-up (Martins, et al., 2017).

According to attitudes of students, it has been clarified that most of students (83.3%) thought that public health students should become models and maintain normal weight. It has been clarified that two-thirds of overweight or obese students are not monitoring their blood glucose and blood pressure, this situation will become a risk factor for these diseases in the nearest future, and approximately similar percentage of them mentioned they had come across health education materials on obesity.

Conclusion

The study concluded that there was a weakness in the perception and knowledge of students on the understanding of BMI, practicing of physical activities, monitoring blood glucose and pressure for obese and overweight students, study recommends for more concentration in academic and non-curricula activities to change these perceptions and practices. The study concluded that the knowledge of students on major risk factors of obesity, relations of obesity with diabetes mellitus type 2, hypertension, sleep apnea, relation of physical activity and weight control were acceptable. According to the study there were a problem in monitoring blood glucose and hypertension among overweight and obese students, which may be reflected in other health problems in the future.

Recommendations

1. Introduce extra educational and non-curricular programs on lifestyle, nutrition and obesity for public health students.
2. Establishment of regular physical activities programs for students especially for those who are overweight or obese.
3. Strengthening of health education programs on obesity and other associated health problems inside and outside university campus.
4. The supply of weight machines in faculty departments.
5. Training of public health students on blood glucose, hypertension measurements methods and equipment's.
6. More researches are required for evaluating knowledge, perception, behavior and practice among public health and other students towards obesity.

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