Perceived Barriers to Physical Activity and Nutrition Among Geisinger Students

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Abstract

Physical inactivity and obesity are major public health problems in the United States. A cross-sectional study was carried out to evaluate the perceived barriers to physical activity and nutrition among a sample of medical and graduate students at Geisinger Commonwealth School of Medicine (GCSoM) on Doylestown and Scranton campuses. A total of 93 students (32 males and 61 females) were recruited to complete an online questionnaire that included questions related to their eating habits, physical activity, and lifestyle. Overall, 74.2% thought exercise was extremely/very important. Over half (62.4%) of the students performed vigorous and moderate physical activities that met the World Health Organization (WHO) criteria of health-enhancing physical activities. The percentage of students who thought that proper nutrition was extremely/very important was 77.4%. Based on the American Heart Association recommendations, only 40.9% of students consumed the recommended amount of protein per week, and ≤6.5% consumed the recommended servings for all other food groups. Students reported several barriers, noting time as the most significant barrier to getting the recommended physical activity and diet as a student.

Introduction

It is crucial to meet daily physical activity and nutritional needs for one's body to function properly and to maintain optimum health (1, 2). For substantial health benefits, it is recommended that adults do at least 150 minutes to 300 minutes a week of moderate-intensity, or 75 minutes to 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate and vigorous-intensity aerobic activity (1). The current dietary guideline from the American Heart Association recommends that adults eat five servings of vegetables, four servings of whole fruits, and six servings of whole grains per day and eight to nine servings of protein-rich foods per week. It suggests consuming three servings of low-fat or fat-free milk a day, and to eat and drink less sodium, saturated fat, and added sugars (3). Most nutritional recommendations such as protein, carbohydrates, fats, vitamins, and minerals intake can be obtained through a well-balanced diet (2).

Despite the well-documented benefits of physical activity and healthy diets, previous studies note the majority of post-secondary education students around the globe do not meet the weekly physical activity and dietary recommendations and had less than optimal health (1, 2, 4, 5, 6). In the United States, it was found that only 42% of college students participated in vigorous activities that met World Health Organization (WHO) criteria, while merely an additional 20% participated in moderate activity (4). It was also found that only a small percentage of college students ate the recommended amounts of fruits and vegetables (4). Lack of adequate physical activity and dietary habits can have significant negative health consequences on the human body (1). Physical inactivity and poor dietary habits have been proven to be significant risk factors for many chronic diseases such as heart disease, diabetes mellitus, and hypertension (5). These chronic diseases have been noted to be major causes of death and disability in the U.S. and among the most preventable (6).

Students who are entering postsecondary education are a group of people who are at a greater risk of making poor health decisions (e.g., poor dietary habits and inactivity) despite the strong emphasis on meeting nutritional and activity requirements (6). These individuals are beginning to live independently and the transition from home to college life often leads to many complex and multifaceted factors that pose a challenge for many students to make healthy lifestyle choices (2). Some of these factors may include adapting to new social and environmental changes, acknowledging new financial responsibilities, building different social networks, and experiencing different time schedules (2). The goal of this study is to identify common barriers to meeting the recommended physical activity and dietary guidelines for graduate and medical students at Geisinger Commonwealth School of Medicine (GCSoM) in Doylestown and Scranton, Pennsylvania. It is important to identify these barriers and to discover how they impact students because today's students will be tomorrow's medical professionals, who can play a major role in health awareness, promotion, and dissemination of healthy lifestyles to the public (4).

Methods

Literature search

A literature review was used to evaluate previous research on the perceived barriers of physical activity and dietary habits that post-secondary students experience. To find this information, various phrases and keywords were used in PubMed and Google Scholar to find relevant articles. Inclusion and exclusion requirements were included to help choose articles most applicable to this study. For example, the articles must have been written in English, published in the last five years and related to physical activity, nutrition, food insecurity, and academic performances. A study on the integration of physical activity and nutrition showed that physical activity has a significant impact on learning procedure among students, and that regular exercise leads to better mental health (8).

Weekly physical activity and dietary recommendations are not being met by a large percentage of students in post-secondary education (10). When researchers surveyed

student populations about their physical activity and dietary habits, researchers were able to identify various external and internal barriers that students encountered that kept them from becoming more active and eating healthier options (10). Some of the physical activity barriers that researchers were able to identify include: time limitations, having other important priorities, the stress and tiredness incited by the work or study overload, not being interested in sports, lack of motivation, not knowing how to work out properly, lack of accessible and suitable workout facilities as well as their high cost, and lack of social support (9).

Researchers have also noted that students face similar barriers to healthy food choices such as: not having local or accessible food options, the cost of nutrient-dense food, time limitations, and social support (10). Unfortunately, studies have noted that students who face barriers to physical activity and healthy diet options have lower probabilities of becoming active and eating healthier options (9). The lower probabilities of becoming active and eating a healthy diet can possibly be attributed to the fact that students perceive the benefit/barrier ratio not sufficient enough to motivate them to choose a healthier lifestyle (10).

Questionnaire

A questionnaire was developed to assess the barriers that Geisinger students face with physical activity and proper dietary nutrition. The questionnaire included items related to students' physical activity and barriers that prevent students from exercising regularly. Nutritional and food insecurity questions were included to determine whether students are facing insecurities related to food access. Prior to launching the survey, a pilot analysis was conducted to determine quality and readability of the survey instrument.

Survey items were reassessed after piloting to improve the quality of the survey. The adjusted survey was distributed by email to graduate and medical students at GCSoM. The survey was open for 4 weeks, from January 29 to February 26 of 2020.

Data analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS®) software. Results were expressed as means ± standard deviation. All reported p-values were two-sided, and p-values less than 0.05 were considered statistically significant.

Results

This study had 93 participants, with 61 being female (Table 1). Overall, 58.1% of the respondents were medical students, and 42% identified as graduate students. Out of the 42% of the graduate students, 25.8% of the students are from the Scranton campus, 14% from the Doylestown campus, and 2.2% from the online campus. Approximately 77% of students did not hold any form of current employment.

Additionally, 74.2% of students reported exercise as “extremely important” and “very important” (Figure 1), while 1.1% of the students reported exercise as “not important.” According to Table 2, we found that 62.4% of students participated in

Characteristics	Number of Participants	Percent of Participants
Sex		
Male	32	34.4
Female	61	65.6
Age (years)		
21-25	59	63.4
26-30	24	25.8
30-35	6	6.5
35-40	1	1.1
Program		
MD-Scranton	54	58.1
MBS-Scranton	24	25.8
MBS-Doylestown	13	14
MBS-Online	2	2.2
Employment		
Yes	20	21.5
No	72	77.4

Table 1. The demographics of the 93 students who participated in this study consists of sex, age, program and employment status.

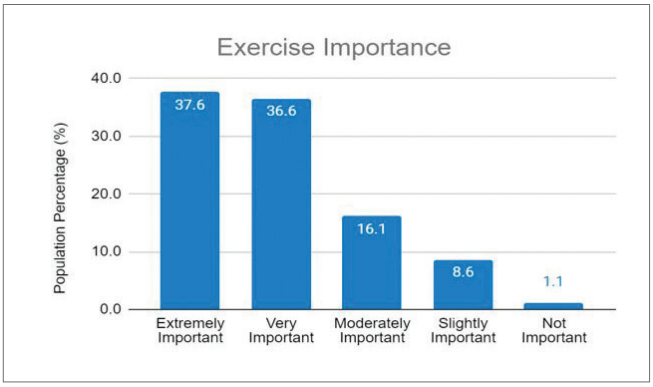

Figure 1. The percentage of students who deemed exercise as extremely, very, moderately, slightly, and not important. Approximately 74.2% of the students considered exercise highly important.

Moderate Physical Activity Participation (2.5-5 Hours a Week)		
Response	**Number of Participants**	**Percentage (%)**
Yes	58	62.4
No	35	37.6
Vigorous Physical Activity Participation (1.25-2.5 Hours a Week)		
Response	**Number of Participants**	**Percentage (%)**
Yes	58	62.4
No	35	37.6

Table 2. shows the percentage of participants who participates in moderate or vigorous activity. A majority (62.4%) of students participate in either vigorous or moderate activity. Moderate physical activity is defined as brisk walking, jogging, using an elliptical trainer, swimming leisurely, and water aerobics and bicycling for under 10 miles per hour for at least 2.5 to 5 hours a week. Vigorous activity is defined as running, swimming laps, aerobic dancing, jumping rope, hiking uphill for at least 1.25 to 2.5 hours a week.

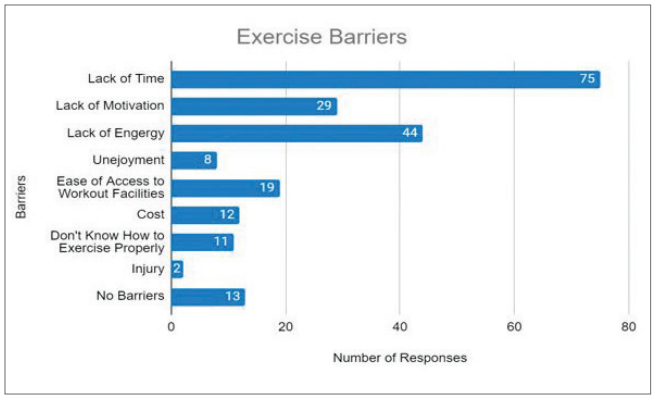

Figure 2. Shows the barriers which prevents students from being physically active. Lack of time, motivation and energy are the most common barriers reported.

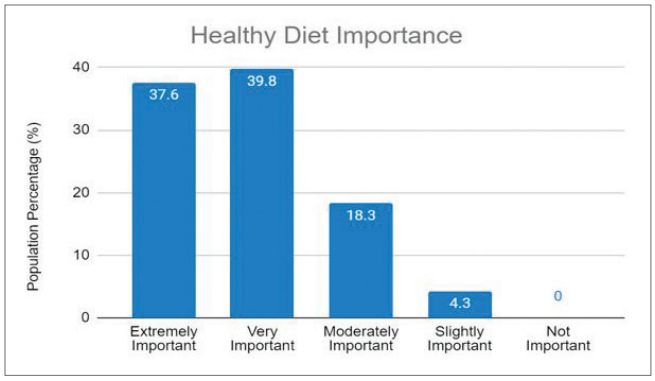

Figure 3. Shows the importance of healthy diet among medical and graduate students. Approximately 37% of students reported that exercise is extremely important, 39.8% reported exercise as being very important, 18.3% considered exercise as moderately important and 4.3% reported slightly important. None of the students reported that exercise is not important.

A

Number of Vegetable Servings per Day		
Servings	**Number of Responses**	**Percentage (%)**
0	9	9.7
1	26	28
2	32	34.4
3	10	10.8
4	10	10.8
5	5	5.4
6+	1	1.1
Number of Fruit Servings per Day		
Servings	**Number of Responses**	**Percentage (%)**
0	13	14
1	36	38.7
2	29	31.2
3	13	14
4	2	2.2
5+	0	0
Number of Servings of Whole Grains per Day		
Servings	**Number of Responses**	**Percentage (%)**
0	1	1.1
1	16	17.2
2	26	28
3	24	25.8
4	16	17.2
5	4	4.3
6	3	3.2
7+	3	3.2

B

Number of Servings of Low-Fat or Fat-Free Milk per Day		
Servings	**Number of Responses**	**Percentage (%)**
0	50	53.8
1	33	35.5
2	10	10.8
3	0	0
4+	0	0
Number of Servings of Protein-Rich Food per Week		
Servings	**Number of Responses**	**Percentage (%)**
0-2	7	7.5
3-4	22	23.7
5-6	26	28
7-8	12	12.9
9-10	5	5.4
10+	21	22.6

Table 3A and B. Current dietary guideline recommends 5 servings of vegetables per day but only 6.5% of participants ate the recommended amount. 2.2% reported eating 4 servings of fruits per day, 6.4% ate 6 servings of whole grains per day, 0% consumed 3 servings of low-fat or fat free milk a day, and 40.9% consumed 8 to 9 servings of protein-rich foods per week.

moderate and vigorous physical activity. Moderate physical activity is defined as brisk walking, jogging, using an elliptical trainer, swimming leisurely, water aerobics and bicycling for under 10 miles per hour for at least 2.5 to 5 hours a week, while vigorous activity is defined as running, swimming laps, aerobic dancing, jumping rope, hiking uphill for at least 1.25 to 2.5 hours a week. (1) Furthermore, 37.6% of students participated in vigorous and moderate physical activity. Among the different barriers investigated for exercise (lack of time, lack of motivation, lack of energy, lack of enjoyment, and ease of access to facility, cost, not knowing how to exercise properly, and injury), energy, motivation and the ease of access to the facility was the most common barriers students face with exercise (Figure 2).

Students reported the importance of nutrition and results demonstrated that 77.4% of the students reported nutrition as “extremely important” and “very important” (Figure 3). 18.3% of the students considered nutrition as being “moderately important.” Table 3A and 3B shows a series of questions asked to obtain data on servings of fruits, vegetables, whole grain, fat-free milk, and protein. The barriers observed in proper diet consumption are lack of time, cost, and ease of asked to investigate the presence of food insecurity and food assistance programs on campus. Healthy People 2020 defined food insecurity as the disruption of food intake or eating pattern because of lack of money and other resources. Currently, the Doylestown campus does not have a food assistance program. The number of students who reported they were not suffering from food insecurity was 81%, while 17% reported they have experienced food insecurity. In addition, the results showed 65% of the students have not utilized any food assistance program on campus, mainly the Scranton students, while 32% have. Thirty-nine percent reported having skipped 1 to 2 meals, while 22.5% reported skipping 3 to 5 meals per day (Figure 5).

Discussion

Previous studies have demonstrated that physical activity and diet play an important role in preventing the onset of chronic non-communicable diseases and are crucial for living a healthy

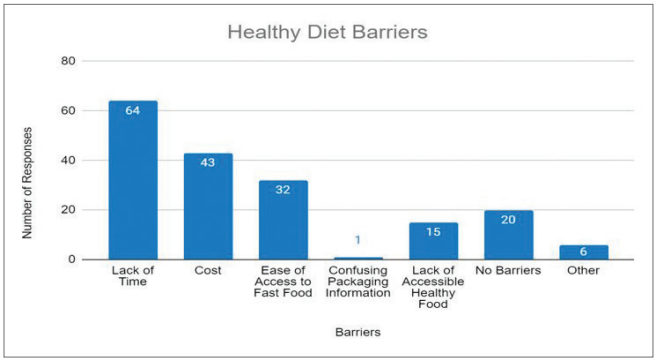

Figure 4. The barriers GCSoM students face with obtaining a healthy diet. We see lack of time, cost, and ease of access to fast food as the common barriers students face.

Experienced Food Insecurity While at GCSoM		
Response	**Number of Responses**	**Percentage (%)**
Yes	16	17
No	75	81
I Do Not Know	2	2.2
Food Assistance Programs		
Program	**Number of Responses**	**Percentage (%)**
Community Food Bank	0	0
Campus Food Pantry	30	32
Community Food Assistance Organization	1	1.1
Supplemental Nutrition Assistance Program	0	0
Child and Adult Care Food Program	0	0
No Food Assistance	62	65
Other	2	2.2

Table 4. Responses obtained when asked about food assistance program availability on campus and potential food insecurities. Most (81%) of the students have not experienced food insecurity, while 17% have not experienced food insecurity. Sixty-five percent of the students have utilized any food assistance program.

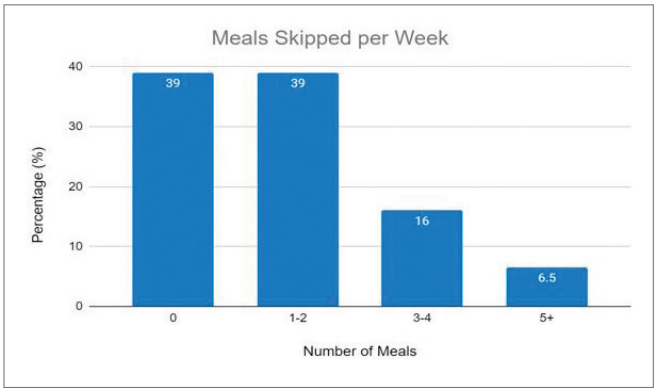

Figure 5. The number of meals students skipped per week. About 39% of the students reported skipping 1 to 2 meals per week.

life (4). Similarly, to the results found in the literature review, this study has found that a large proportion of the students at GCSoM do not meet the recommended amount of physical activity per week or the nutritional intake guidelines despite the known health benefits. At GCSoM, 62.4% of graduate and medical students reported obtaining the recommended amount of moderate and vigorous physical activity laid out by WHO even though most students thought that exercise was very or extremely important. A possible explanation of why students are not meeting the recommended amount of exercise per week can be attributed to the barriers that students face. According to the study, about 86% of students at GCSoM face some sort of barrier that prevents them from meeting these guidelines. The significant barriers reported by physically inactive students were: lack of time, lack of motivation, lack of energy, and lack of accessible workout facilities. We recommend that there is a need to promote physical activity among medical and graduate students. Both individual and population approaches are needed. For an individual approach, developing social support from friends and families may be a key tactic to increase activity levels among students. For a population approach, the medical school policymakers can take suitable action to highlight the importance of fellow students' and families' involvement in promoting physical activity. To help students overcome these barriers and see them meet the recommended amount of physical activity, specific interventions that will target these barriers must be carried out. For example, GCSoM can partner with the local fitness centers to provide monthly memberships at a low cost for students.

Similarly, the majority of students (77.4%) thought that nutrition was very or extremely important. Based on the American Heart Association's recommendations, less than half of the students at GCSoM ate the recommended amount of servings from each food group. Only 40.9% of students ate the recommended amount of protein per week, and ≤6.5% of students ate the recommended amount of servings for all other food groups. One possible explanation of why students are not obtaining the recommended amount of servings can be due to various barriers. According to the data, 79.5% of students experience at least one barrier that prevents them from eating the recommended amount of servings. The significant barriers reported by students were: lack of time, cost, and ease of access to fast food. A second explanation could be due to diet fads and trends like the keto diet, which is a low-carbohydrate diet that limits foods that can be eaten, or intermittent fasting, which can limit the amount of food eaten per day. Intermittent fasting could also explain why some students are not meeting the American Heart Association's recommendations and also the number of skipped meals reported. A third explanation could be attributed to food insecurity found on campus. Approximately 17% of students reported experiencing food insecurity and 32% have reported using the school food pantry. Furthermore, the dining options currently on campus are not very nutritional and are very expensive. Due to the cost and lack of healthy food options, students do not regularly obtain food there.

One major limitation of this study was that we did not have direct access to the SPSS software, which made it difficult to calculate correlations. A second limitation was that some survey questions were not specific enough. For example, the survey did not specify what a serving of milk was (8 ounces) or include alternative types of milk, such as soy or almond milk. Since we did not specify that the serving is 8 ounces or milk alternatives, the number of servings reported might not represent the actual amount of servings consumed by

students. We also did not specifically ask if meal skipping was due to food insecurity. Students may be skipping meals due to different diets, religion practices and lack of cultural and type of foods offered on campus. In relation to that, the third limitation to this study was that we assume that one diet works for all (Figure 6). Furthermore, other demographics information pertaining to race/ethnicity, religion/spirituality necessary to understanding the dietary needs of the participants were not obtained. Even though the American Heart Association has recommendations for how many servings of each food group should be consumed, that does not mean that these recommendations are what is best for each individual.

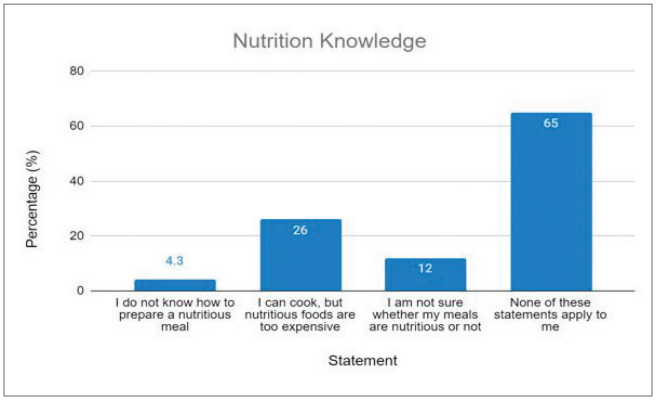

Figure 6. Students' knowledge regarding nutrition

Conclusions

Future studies should determine which barriers are significant for the MD as opposed to the MBS program and how the different campuses' locations impact the overall result of the study. Looking at the programs separately will allow for the implementation of specific interventions that work best for each program. In addition to this, future studies should investigate whether physical activity and nutrition barriers affect academic success. One of the questions on this study's survey asked the participants about their grade point average. However, not enough data were collected to make a correlation since most of the participants only had pass/fail grades. Furthermore, questions related to ethnicity, religion, and socioeconomic status should also be asked to determine if they impact diet or the amount of physical activity per week.

Since the most significant barriers reported by students are lack of time, ease of access to fast and cost, it would be imperative to set up programs that will effectively target these barriers. For example, including a time management course that is available to students multiple times a year would potentially help address the lack-of-time barrier, since it may teach students techniques that can help them learn how to manage their time effectively. A second assistance program that would be beneficial to the students would be a food pantry. Approximately 32% of students at the Scranton campus reported using a food pantry while studying at GCSoM, but there are no school pantries currently available to students at the Doylestown campus. Adding a food pantry will allow students to obtain nutritious foods if they are unable to purchase them on their own. Introducing these recommendations at student orientation or open houses will ensure that all students are aware of all the assistance programs available to them. Similarly, handing out fact sheets of local affordable grocery stores, farms, or community food pantries will help tackle the nutrition problem too.

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