Journal of Advances in Medicine and Medical Research

34(22): 450-465, 2022; Article no.JAMMR.91691
ISSN: 2456-8899
(Past name: British Journal of Medicine and Medical Research, Past ISSN: 2231-0614, NLM ID: 101570965)

A Quantitative Assessment of the Impact of Nutritional Choices, Quality of Sleep and Physical Activity on the General Health of Staff and Students at the All Saints University School of Medicine, Dominica

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Authors' contributions

This work was carried out in collaboration among all authors. Author OM designed the study. All authors collaborated to carry out the study and write the initial manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2022/v34i224832

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/91691

Original Research Article

Received 02 August 2022
Accepted 09 October 2022
Published 19 October 2022

ABSTRACT

This study utilized a quantitative approach to investigate the impact of nutritional choices, quality of sleep and physical activity on the general health of staff and students at the All Saints University School of Medicine, Dominica. Seventy-seven people (14 staff members and 63 students) participated in the survey. The Nutritional Assessment Instrument of the Government of Northwest Territories was utilized to assess the nutritional choices of participants, the Pittsburgh Sleep Quality Index (PSQI) was used to determine the quality of sleep, the International Physical Activity Questionnaire—Short Form was used to assess the physical activity while the SF-36 Questionnaire was utilized to assess the general health of participants. The mean general health of participants was 75.46 (SD = 15.44) out of a maximum of 100. Nutritional choices (r = .270, P = .018), quality of sleep (r = .387, P <.001) and physical activity (r = .237, P = .040) all had

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significant positive correlations with general health. A regression analysis indicated that quality of sleep (B = 13.881, p<.001) and nutritional choices (B= 10.352, p= 0.002) were the best predictors of general health while physical activity (B = 4.099, p = .063) also had a weak but non-significant positive contribution. While males had a higher mean general health compared to females, this difference was not statistically significant (P>.05). The study recommends an improvement in sleep quality, nutritional choices and physical activity and recommends, among others, the following: education of students on the need to observe good nutritional choices, quality of sleep and exercises; establishment of a cafeteria that offers healthy foods and snacks, and the creation of a Fitness Club in the University. The authors recommend that a similar study should be conducted in other institutions, especially governmental agencies and religious organizations in Dominica, as well as in other Caribbean medical universities. A further study into how nutritional choices, quality of sleep and physical activity are related to specific non-communicable diseases such as obesity, high blood pressure and diabetes mellitus in the Caribbean, using both quantitative and qualitative approaches, is also recommended.

Keywords: Nutritional choices; quality of sleep; physical activity; general health; Medical University; Dominica.

1. INTRODUCTION

Many factors outside of the hospital setting have been shown to contribute to people's health [1]. These include good nutrition, adequate sleep and physical exercise [2–4]. Warburton et al. [4] reported that physical activity helped to prevent several disorders including obesity, diabetes, cardiovascular disorders and cancers. The authors also reported that there appeared to be a linear positive relationship between the extent of physical activity and the health status of individuals, and that the instructions from Health Canada produced health benefits to people [4]. Correa et al. [2] reported that disruption of sleep affects the circadian cycle and this could lead to poor performances, including poor academic performance of students. Medic et al. [5] reported that disruptions of sleeps have been linked to several health disorders, including pains, emotional stress, gastrointestinal and cardiovascular disorders, hypertension, and hyperlipidemia. Likewise, dietary habits have been found to affect the body's homeostasis and poor nutritional choices have been linked to several health disorders [3]. Recently, there has been an awakening to address the health issues of young people as this can help to prevent lifelong bad choices and also enhance efficiency of healthcare services [6]. Rosi et al. [7] conducted a review on eating habits of the youths in Europe, North America and Oceania and found out that the youths did not fully follow nutritional recommendations for foods such as vegetables, fruits and legumes; neither did they follow the recommendations on sodium intake. No such research had been conducted in Dominica.

Improving the dietary habits of people may require educational and behavioural interventions [7]. Unhealthy diets and the resultant obesity have been associated with several chronic non-communicable diseases and have been reported to be responsible as risk factors for deaths and disability worldwide [8]. On the other hand, healthy eating has been demonstrated to be beneficial in the prevention and treatment of several non-communicable diseases [9–11]. Simple positive changes in dietary patterns can improve well-being, quality of life and better mental health indices [12]. Unhealthy dietary patterns comprise both abundantly unhealthy foods and scarcely healthy foods, as both choices are not mutually exclusive.

Globally, the most significant risk factors contributing to the overall burden of unhealthy diets include low fruits, high sodium content, insufficient whole grains, inadequate vegetables as well as low nuts and seeds [8]. There are several studies that have demonstrated certain food groups with improved quality of life. In a study involving 50,000 individuals in the UK, it was reported that an increase in one portion of fruits and vegetables over a 5-year duration resulted in a 0.133 point increase in well-being [13].

Regular consumption of fruits and vegetables has been associated with improved quality of life across different populations. For instance, dietary interventions improved depression, anxiety and productivity in a multicenter corporate insurance company in the United States [14]. Furthermore, regular intake of fish has been linked with better mental health indices [15] while high fibre diet

has been associated with increased energy as well as improved self-reported physical and mental health [16]. Also, a couple of studies involving children and young adults associated frequent consumption of fast foods and snacks with lower quality of life [17,18]. Diets rich in classes of foods such as fruits, vegetables, whole grains and fish have also been associated with reduction in the incidence of cardiovascular and neoplastic disease conditions [19,20].

Quality of sleep remains central as one of the core indices for determining healthy sleeping habits [21]. Healthy sleep is a fundamental human need. Sleep deprivation and disturbances alter metabolic and inflammatory processes, with immense negative impacts on general health. Concerning sleep quality, studies indicate that poor sleep quality is associated with higher mortality rates, prevalence of metabolic syndrome, coronary heart disease, diabetes, hypertension, depression [22–25], traffic and work accidents [26] as well as poor productivity and quality of life. A seven hours uninterrupted night sleep is recommended for humans [27]. However, there are other factors to consider in determining the overall quality of sleep, including sleep disturbance, sleep latency, day dysfunction due to sleepiness, sleep efficiency, overall sleep quality and needs for medications to sleep [2,27,28].

One good definition of sleep health states that '*Sleep health is a multidimensional pattern of sleep-wakefulness, adapted to individual, social and environmental demands, that promotes physical and mental wellbeing. Good sleep health is characterized by subjective satisfaction, appropriate timing, adequate duration, high efficiency and sustained alertness during waking hours*' [21].

Physical activity is defined as '*any bodily movement that requires energy expenditure '* [29]. It '*involves people moving, acting and performing within culturally specific spaces and contexts, and influenced by a unique array of interests, emotions, ideas, instructions and relationships* [30]. It involves any body movement that is generated by smooth muscle contraction designed to raise energy expenditure above basal metabolic rate and, is influenced by its frequency, intensity, duration, modality and context of practice [31].

Physical activity plays a fundamental role in healthy lifestyle. It has been positively associated with numerous health benefits. These include reduced overall mortality, improved musculoskeletal health with reduced risk of osteoporosis, stress/ anxiety/ depression reduction, reduced risks of cardiovascular disease, obesity, stroke, cancer, and enhancement of psychological wellbeing with mental health [32].

A meta-analyses reported an inverse association between physical activity (walking and cycling) and risk of all-cause mortality, suggesting that walking and cycling results in a 11% and 10% risk reduction in those who conducted 11.25 MET hours per week [32].

Regarding mental health, Phenylethylamine is an endogenous neuroamine associated with regulation of mood and physical energy while Monoamine Oxidase B preferentially metabolizes phenylethylamine to phenylacetic acid [33]. Low levels of both phenylacetic acids and phenylethylamine have been reported in depressed patients [33]. Similarly, substantial increases in urinary phenylacetic acid levels were reported after 24 hours of moderate to high intensity aerobic exercise [33]. This underlines the antidepressant effects of exercise as well as the relationship between exercise and phenylethylamine concentrations.

Furthermore, regarding the impact of physical activity on mortality risks and cardiovascular events, the findings of a study that involved 130,000 people across 17 high, middle and low-income countries demonstrated that lower mortality risks as well as decreased cardiovascular events were associated with higher recreational and non-recreational physical activity, both in low-income, middle income and high-income countries [34]. Thus, regular increase in physical activity could be a cost-effective approach to reducing deaths and cardiovascular diseases globally [34].

This research was conducted to assess the nutritional choices, quality of sleep and physical activities of staff and students at the All Saints University School of Medicine and to investigate any impact the variables may have on the health and wellness of these people. This is very important because *health is wealth*, as the saying goes. Good health would amount to high efficiency and productivity for both staff and students of the institution. Findings from this research contribute to the body of knowledge and also would help

the students and staff of the All Saints University to gain better appreciation of how sleep quality, diets and physical activity may be crucial to overall health. Moreover, these findings would help policy makers and the general public to gain better insights into how good feeding habits, good quality of sleep and good exercise could help to improve the general health of people.

1.1 Research Problem Statement

The main problem is that poor dietary choices, poor sleep quality and decreased physical activity have been reported to be linked to a lot of health disorders in different parts of the world. A study of this nature had not been conducted in Dominica and especially at the All Saints University. In view of the fact that non-communicable diseases abound in many parts of the world, including Dominica, and most of these diseases have been linked to diets, inadequate sleep and physical inactivity, this present study was conducted to assess these factors and create more awareness for improved healthy lifestyles, especially among the students.

1.2 Theoretical Framework

This research study is based on the health belief model [35] which states that there would be positive behavioural changes in people if the target obstacles, profits, advantages, disadvantages or threats of a phenomenon are well communicated to the intended audience. In other words, when people realize the health advantages/ benefits of making lifestyle changes and the repercussions of not doing so, they are most likely to effect the changes.

This assertion is corroborated by the report of Masoudiyekta et al. [36] who used the health belief model as a basis to conduct a quasi-experimental study on how education affects breast cancer screening in women in Iran. The authors reported that proper information dissemination concerning breast cancer, its risks, and its prevention led to positive attitudes toward breast cancer screening among the women. This present study assessed the impacts of the identified factors from the literature on the general health of staff and students at the All Saints University and strives to get the populace in Dominica informed on some positive changes that could improve health and wellness.

1.3 Research Purpose

The purpose of this research was to assess the nutritional choices, quality of sleep and physical activities of staff and students at the All Saints University School of Medicine and to investigate the impacts of these factors on the general health of participants.

1.4 Aim

This research investigated the nutritional choices, quality of sleep and physical activities of staff and students at the All Saints University School of Medicine. The study also investigated the associations that each of these factors had on the general health of the participants. A regression analysis was conducted to determine any predictive effect that the independent factors may have on the general health of the people.

1.5 Objectives

This study focused on the following objectives:

1. To assess the nutritional choices, quality of sleep and physical activities of staff and students at the University.
2. To investigate whether nutritional choices have any relationship with the general health of the staff and students in the University.
3. To investigate whether quality of sleep has any relationship with the general health of staff and students in the university.
4. To investigate if physical activities have any relationship with the general health of staff and students in the university.
5. To investigate whether nutritional choices, quality of sleep and physical activity are significant predictors of the general health of staff and students in the University.
6. To assess whether there are differences in nutritional choices, quality of sleep and physical activities based on gender.

2. METHODOLOGY

This study utilized the quantitative approach. Quantitative research hinges on positivism [37]. A quantitative approach is chosen because it is objective, impartial, replicable, predictable and deterministic [37,38]. The entire staff and students of the All Saints University were targeted for the study. However, the survey was voluntary. Faculty staff, nonteaching staff, and students at the All Saints University School of

Medicine, Dominica were eligible to participate in the study. Students who had graduated from the institution were excluded from the study.

After an approval letter was obtained from the Research Committee of the All Saints University, the link to the questionnaire was sent to the faculty staff and students through the office of the Academic Dean. The link was sent to the nonteaching staff through the office of the Registrar, Administration. The opening page of the questionnaire explained the purpose of the questionnaire. Participants were assured of their anonymity and confidentiality. There was a *CONSENT* button on the questionnaire that participants clicked for them to proceed. Those who were unwilling to participate in the study did not bother to click on the button.

2.1 Period of Research Study and Duration

This study was conducted during the 2022 winter semester after approval was obtained from the ASUSM Research Committee/ Research Ethics Committee. The surveys took about 30 minutes to complete. Participants were given a two-week period to answer the survey.

2.2 Research Instruments

The Nutritional Assessment Instrument of the Government of Northwest Territories was utilized to assess the nutritional choices of the participants. This instrument was adapted from the nutritional assessment instrument created by Paxton et al. [39] and is in the public domain and allowed to be used for nutritional assessment studies. The Nutritional Assessment Instrument is rated on a Likert scale of 1 to 5. The highest possible score is 50 while the lowest is 10. Scores between 10 and 19 are poor and need improvement; scores between 20 and 29 are fair, scores between 30 and 39 are good while scores between 40 and 50 are excellent (Healthy Living Assessment, 2017). Based on their total scores, participants were grouped into four categories: Poor (Need improvement), Fair, Good and Excellent.

The Pittsburgh Sleep Quality Index (PSQI) instrument was used to determine the quality of sleep. This instrument was developed by Buysse et al. [27] and is useful for both hospital practice and research purposes. It has 86.5% specificity (kappa=0.75, $p<0.001$) [27]. The PSQI is a validated instrument used worldwide. It has seven components which are: duration of sleep, sleep disturbance, sleep latency, day dysfunction due to sleepiness, sleep efficiency, overall sleep quality and needs for medications to sleep [2,28]. Based on the scoring results, participants were categorized as either having *Poor Quality of Sleep* or *Good Quality of Sleep*.

The International Physical Activity Questionnaire—Short Form [40] was utilized for the physical activity assessment. This instrument has been validated and used by many researchers for assessing physical activity of individuals [41]. Based on their scores, participants were categorized into three groups: *Low Activity Level, Moderate Activity Level*, and *High Activity Level.*

The SF-36 Questionnaire was utilized to assess the general health of the participants. This instrument has been reported to be widely used by researchers for similar studies [42]. There are 36 questions and each question is rated between 0 and 100. Therefore, the highest overall score is 3600 while the lowest is 0. However, the percentage scores were used for the statistical analysis.

2.3 Data Collection

A survey method was utilized to extract information from the participants. Questionnaires have been found to be very useful in educational research, including medical education research [43]. Data were collected anonymously online through the Google Forms. All the instruments were pulled together in one survey and sent to the participants (staff and students). The survey had a demographic portion which captured Participant's Status (Staff or Student), and Gender (Male or Female). The link to the survey was sent to participants through the Dean's office and the Administrative Registrar's office. Responses of participants stored in the Google Forms were password-protected.

2.4 Data Analysis

Responses from participants were recorded into Microsoft Excel files and the data transferred into the Statistical Packages for Social Sciences (SPSS) files. The SPSS 28 software was utilized for both descriptive and inferential statistical analysis. Results from the data analysis were utilized to answer the research questions and to test the hypothesis.

Descriptive statistics included means, percentages and tables. Inferential statistical analysis involved testing the hypotheses through correlational tests, independent sample T-Tests, Mann-Whitney U tests, and regression. The alpha value was set at .05. If the *P* value was greater than .05, the null hypothesis was accepted. If the *P* value was equal to or less than .05, the null hypothesis was rejected and the alternative hypothesis was accepted.

2.5 Testing for Credibility

The credibility of this study was assessed via use of standardized instruments and testing for the assumptions of independent sample T-test and regression. The assumptions were assessed through the multicollinearity tests. The normality histogram as well as the normal P-P plot of the regression standardized residual for the dependent variable, general health, were also determined.

The normality of the dependent variable (health status) was determined by histogram.

2.6 Statistical Analysis to Answer the Research Questions and Hypothesis

Research Question 1: What are the nutritional choices, quality of sleep and physical activity status of staff and students at the All Saints University?

This research question was answered by the descriptive statistics of percentages, means and standard deviations.

Research Question 2: Do nutritional choices, quality of sleep and physical activities `impact the general health of staff and students in All Saints University?

H_0: Nutritional choices, quality of sleep and physical activities do not impact the general health of staff and students at the All Saints University.

H_1: Nutritional choices, quality of sleep and physical activities do impact the general health of staff and students at the All Saints University.

Spearman rank correlational tests were first conducted to determine any correlations between the independent factors (nutritional choices, quality of sleep and physical activity) and the dependent variable (general health). After this, a linear regression analysis was conducted to assess the impacts of nutritional choices, quality of sleep and physical activity on the health status of the participants. The regression analysis determined the best predictor(s) of general health among the independent variables. Gender and Participant Status were used as controlling variables. Since these are nominal variables, they were first converted to dummy variables before they are used for the regression analysis. For Gender Dummy, Male = 0 while Female =1. For Participant Status Dummy, Staff =0 and Student = 1.

In addition, independent sample T-Tests were conducted to assess any statistical differences in the means of general health of participants based on gender and status (staff or students). Mann-Whitney U tests were used to determine any statistical differences in the nutritional choices, quality of sleep and physical activity of participants based on gender and status (staff/ students).

2.7 Limitation

One limitation of this study is the fact that it used questionnaires and it is difficult to tell whether participants would be honest with their responses or not. However, since the survey was conducted anonymously and participants were assured of their anonymity and confidentiality, it was and is expected that they would be truthful.

2.8 Delimitation

This study was limited to students and staff at the All Saints University School of Medicine, Dominica. Students that had graduated from the university were excluded from the study.

3. RESULTS

There were a total of 77 participants; 63 were students while 14 were staff. Based on gender, there were a total of 44 female and 33 male participants.

Research Question 1: What are the nutritional choices, quality of sleep and physical activity status of staff and students at the All Saints University?

This research question was answered by the descriptive statistics of means, frequencies and percentages, as indicated in Table 1 below.

Table 1. Summary of nutritional choices, quality of sleep, physical activity and general health of participants

Variable		Frequency	Percentage
Nutritional Choices	Poor	1	1.3
	Fair	9	11.7
	Good	62	80.5
	Excellent	5	6.5
	Total	77	100
Sleep Quality	Poor	40	54.1
	Good	34	45.9
	Total	74	100
Physical Activity	Low	39	51.3
	Moderate	27	35.5
	High	10	13.2
	Total	76	100
General Health		(M=75.46, SD=15.44)	75.46

From the Table above, it can be seen that 1 participant (1.3%) had poor choices, 9 (11.7%) had fair choices, 62 (80.5%) had good choices while 5 participants (6.5%) had excellent nutritional choices. It can be seen that 40 participants (54.1%) had poor sleep quality while 34 participants (45.9%) had good sleep quality.

It can also be seen that 39 participants (51.3%) had low physical activity, 27 participants (35.5%) had moderate physical activity while 10 participants (13.2%) had high physical activity.

The overall general health of participants was 75.46% (M=75.46, SD=15.44).

3.1 Correlational Analysis

The Spearman rank correlational analysis of relationships between the independent factors and general health is presented in Table 2.

Table 2 shows that each of the three independent variables exhibited positive and statistically significant (P<.05) correlation with general health of participants.

3.2 Regression Analysis

The impact of nutritional choices, quality of sleep and physical activity on the general health, using gender and participant status as controlling variables, is presented in Tables 3 and 4.

The F value is 8.405 (which is far greater than 1) and the P value is less than .001. Therefore, the null hypothesis is rejected; the alternative hypothesis is upheld. This shows that the independent variables impact the general health of participants in a statistically significant manner.

Table 2. Summary of correlational analysis

Variable	Sample Size (independent Variable)	Sample Size (Dependent Variable)	Correlation Coefficient (r)	*P* Value (-Tailed)
Nutritional Choices	77	77	.270	.018
Quality of Sleep	74	77	.387	<.001
Physical Activity	76	77	.237	.040

Table 3. Summary of regression model

R	R Square	Adjusted R Square	ANOVA F	Sig.	Regression df	Residual df
.621	.385	.340	8.405	<.001	5	67

Table 4. Contributions of independent factors to the general health of participants

	Unstandardized B	S.E of Unstandardized B	Standardized Coefficient Beta	t.	Sig.	Collinearity Tolerance	Collinearity VIF
Constant	24.487	11.998		2.041	.045		
Participant	-4.203	3.845	-.108	-1.093	.278	.940	1.063
Gender	-5.326	3.061	-.173	-1.740	.086	.928	1.077
Nutritional Choices	10.352	3.157	.323	3.279	.002	.947	1.056
Quality of Sleep	13.881	3.038	.452	4.570	<.001	.939	1.065
Physical Activity	4.099	2.171	.186	1.888	.063	.941	1.063

Table 3 above shows an R Square of .385 and an adjusted R Square of .340. R square depicts the proportion of variance of general health that is determined by the independent factors in the sample while the Adjusted R Square denotes the estimated proportion in the population. Since the R Square value is .385, this indicates that 38.5% of the general health of participants can be accounted for by the independent factors.

The results of the regression indicated that the model explained 38.5% of the variance and that the model was a significant predictor of general health, F(5, 67) = 8.405 p<.001. Table 4 presents the contribution of each independent factor on the general health of participants. While Nutritional Choices (B= 10.352, p= 0.002) and Quality of Sleep (B = 13.881, p<.001) contributed significantly to the model, Physical Activity (B = 4.099, p = .063), Gender (B = -5.326, p = .086) and Participant Status (B = -4.203, p = .278) did not.

The regression analysis resulted in the following equation specification:

> General Health = 24.487 + (10.352*Nutritional Choices) + (13.881*Quality of Sleep) + (4.099*Physical Activity) - (5.326*Gender) - (4.203*Participant Status).

Since 0 is given for Male in the Gender Dummy variable and 1 to Female, Male is the reference for gender. Therefore, female participants would have 5.326 less than males as a contribution of gender to the general health. In a like manner, Participant Status Dummy variable has 0 for Staff and 1for Student. Therefore, the student has 4.203 less than staff as contribution of participant status to the general health. The equation was statistically significant at the <.001 level as indicated by the *F* value of 8.405. The *t*-statistics was used in the selection of the statistically significant variables.

This equation suggests that nutritional choices and quality of sleep were the most significant predictors of general health. Physical activity has a P value that is greater than .05; therefore, it is not a good predictor of general health in this study. The demographic variables of gender and participant status are also not good predictors of general health since they are not statistically significant.

3.3 Results of Assumption Tests

Statistical analysis showed that the correlations between the independent variables were much less than 0.8. This signifies that there was no multicollinearity between them [44]. To further test for the multicollinearity, tolerance and variance inflation factor (VIF) were determined. The tolerance values were greater than 0.10 and the VIF values were less than 10. This indicated that there was no multicollinearity [44,45]. The histogram of regression standardized residual (Fig. 1) showed a normal distribution curve and the normal P-P plot (Fig. 2) also showed near linearity.

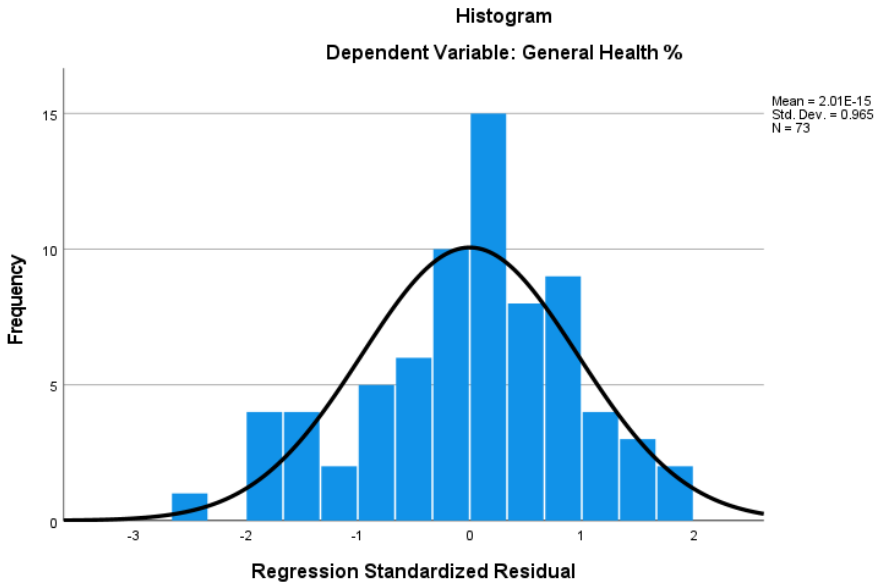

Fig. 1. Regression standardized residual

Fig. 1 shows the normality of the regression standardized residual for the dependent variable, general health.

The Normal-PP plot for regression residual was determined and the result is shown in the Fig. 2.

3.4 Results of the Other Statistical Tests

An independent sample T-test indicated that staff participants had a higher mean general health (M = 83.13, SD = 11.93) than student participants (M = 73.75, SD = 15.69) and this difference is statistically significant (P = .039). A T-test analysis also indicated that the male participants had a higher mean general health (M = 78.05, SD = 14.97) than the female participants (M = 73.51, SD = 15.67); however, the difference is not statistically significant (P>.05).

A Mann-Whitney U test showed that staff participants had higher mean ranks in quality of sleep, nutritional choices and physical activity compared to the students, but the differences were not statistically significant (P>.05). A Mann-Whitney U test also indicated that there were no statistically significant differences in the mean ranks of participants in quality of sleep, nutritional choices and physical activities based on gender (P>.05).

4. DISCUSSION

This study shows that the mean general health of the participants is 75.46 (SD = 15.44). The study also shows that 87% of participants had either good or excellent nutritional choices while the remaining 13% had either fair or poor nutritional choices (Table 1). These are commendable. As indicated in the questionnaire, good nutritional choices include healthy diets such as vegetables, whole fruits, fish, poultry, beans and healthy snacks like nuts while unhealthy foods include, for example, high-salt/sugar foods, soda drinks, high-fat meals, and foods rich in trans fats. However, 54.1% of participants had poor sleep quality while 45.9% had good sleep quality. This is worrisome and needs to be addressed. Several factors were considered in arriving at the overall quality of sleep, as indicated in the instrument. However, one of them is the sleep duration in which a good sleep is supposed to take at least seven hours of uninterrupted sleep. Likewise, 51.3% of participants had low physical activity while 35.5% had moderate physical activity and 13.2% had high physical activity. This also needs to be looked into. The mean general health of male participants (M = 78.05, SD = 14.973) is higher than that of females (M = 73.51, SD = 15.674) though the difference is not statistically significant.

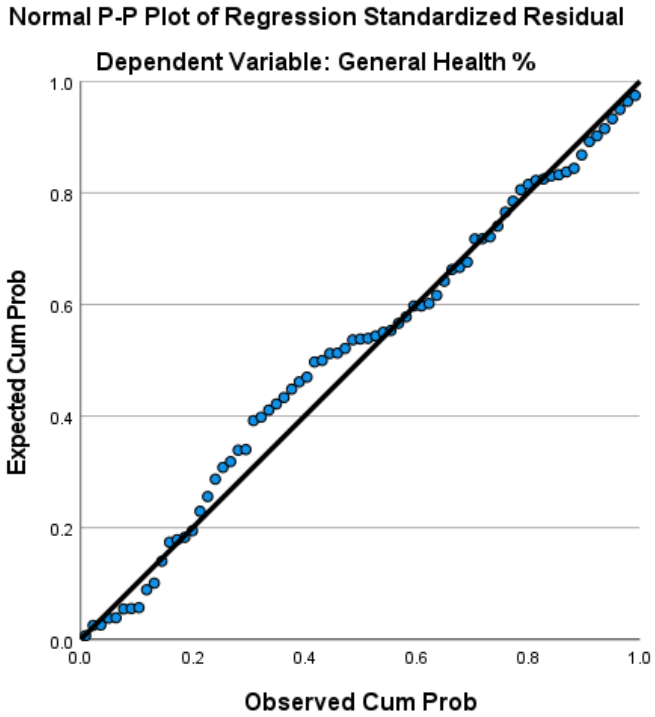

Fig. 2. Normal-PP plot for regression residual

The P value for the regression is less than .05 (P<.001). Therefore, the null hypothesis is rejected while the alternative hypothesis is upheld. This shows that the independent factors significantly impacted quality of health of participants. The regression results shows that quality of sleep and nutritional choices are the best predictors of general health.

The regression equation is:

General Health = 24.487 + (10.352*Nutritional Choices) + (13.881*Quality of Sleep) + (4.099*Physical Activity) - (5.326*Gender) - (4.203*Participant Status).

This study buttresses earlier reports on the impacts of quality of sleep and nutritional choices on the general health of people. Though not statistically significant, Physical Activity's contribution in regression is still positive and this shows that physical activity may contribute to the general health though the impact may not be as strong as those of quality of sleep and nutritional choices. Gender and Participant Status did not contribute significantly to the regression; however, they still add to the regression equation.

As indicated in Table 2, Nutritional Choices (r = .270, p = .018), Quality of Sleep (r = .387, p<.001) and Physical Activity (r = .237, p = .040) all have positive and statistically significant correlations with general health. From the results and the literature, the following syntheses are made:

4.1 Nutritional Choices and General Health

Our findings showed that nutritional choices are among the best predictors of general health based on the regression model. Nutritional choices as a variable also shows a statistically significant positive correlation to the general health. This finding echoes the results of similar studies that were done by other researchers. Studies by Wright et al. [46] examined the association of nutrition behavior with the obesity levels in Caribbean undergraduate students and found a correlation in avoidance of healthy food choices with the high prevalence of obesity among these students (P < 0.05 for all variables considered) [46]. Likewise, a study done by Bede et al. [47] in Cameroon among three universities showed that poor eating habits such as snacking topped the bracket for the larger percentage of students. Skipped meals was a custom and only 33.5% had three daily meals.

4.2 Sleep Quality and General Health

Quality of sleep is the best predictor of general health, based on the regression model. It also shows a statistically significant positive correlation with general health. Our study agrees with studies from other parts of the world that good sleep is associated with good health. Clement-Carbonell et al. [48] reported a significant association between sleep quality and both physical and mental health. Dalmases et al. [49] affirmed that improved sleep health was associated with improved health status.

Seun-Fadipe et al. [50] conducted a study in the University of Ile-Ife to evaluate undergraduate students' sleep quality. Their results revealed that half of the student participants reported poor quality of sleep alongside the presence of anxiety, depression and psychological distress. Carpi et al. [51] carried out a study centered on the university students of Sapienza University of Rome, one of Italy's largest universities. According to the PSQI, up to 65% of the sample had poor sleep quality, with 55% of participants reporting pertinent insomnia symptoms. Individuals with poor sleep quality had lower physical and mental health-related quality of life. They concluded that their study found a substantial connection between the key elements of sleep quality and physical and mental health-related quality of life. Barros et al. [52] also reported the prevalence of poor sleep was among population subgroups in Brazil.

4.3 Physical Activity and General Health

Although nutritional choices and quality of sleep are the best predictors of general health, as shown by the regression result, the role of physical activity however could not be ignored. Our study showed a positive significant correlation between physical activity and general health, and physical activity is also a weak positive contributor in the regression model. Physical exercise in most people results in positive emotions which could equally enhance the functioning of the immune system thus leading to better general and even cardiovascular health [53]. Kim & McKenzie, [53] carried out a phenomenological research at Southern Illinois University where the impact of physical exercise on psychological well-being was analyzed [53]. Their study also showed that

the discipline that comes from physical exercise could also be reflected in other health practices. Hence, individuals who carry out physical exercise tend to promote other healthy behaviors; thus, physical exercise could lead to better general health practices like nutrition and quality of sleep [53].

Snedden et al. [54] carried out a study among undergraduate student-athletes and non-athletes in a large Midwestern University. The authors concluded that participation in any form of physical activity would lead to a generalized improvement in overall health. A study conducted in New Delhi, India to assess the association between physical activity and quality of sleep on mental health among college students also demonstrated a significant and inverse relationship between physical activity and anxiety [55]. Physical activity is linked with mental health. Physical exercise improves positive emotion and hence can become therapeutic in the management of psychological and mental health complaints like anxiety and depression [55].

Wright et al. [46] studied the association of nutritional behaviors and physical activity on the general and central obesity in Caribbean undergraduate students. They conducted a study to evaluate the association of nutritional behaviors and physical activity with general obesity. The study included undergraduate students from Barbados, Jamaica, and Grenada. In this study, the International Physical Activity Questionnaire (IPAQ) short form was used to analyze the amount of physical activity done by students. Met scores were calculated and used in categorizing students into groups of vigorous, moderate, and low activity. This study showed about 46% of females and 24% of males recorded low levels of physical activity. Though the authors did not establish any significant relationship between nutritional choices and physical activity, their study was relevant due to the risk of cardiovascular disease that is associated with low levels of physical activity [46]. Other researchers have reported positive correlation and impacts of physical activity on the general health [56,57].

5. CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

5.1 Conclusion

This study has demonstrated that quality of sleep and nutritional choices are the best predictors of general health at the All Saints University School of Medicine, Dominica. The study also indicated that Physical Activity has a positive significant correlation with general health and also contributes positively (though non-significantly) to general health in the regression model. Males appeared to have a mean better general health compared to the females though the difference is not statistically significant. Likewise, staff had better and statistically significant mean general health compared to the students. These findings have both practical and theoretical implications, and would assist policy makers in making decisions and policies that would assist people to promote their general health.

5.2 Implications of the Study

5.2.1 Practical implications

This study has provided new empirical evidence that nutritional choices and quality of sleep are good predictors of general health of people. The study also showed that majority of participants had poor quality of sleep and low physical activity. These need to be addressed. However, only 13% of participants had poor/fair nutritional choices while 87% had either excellent or good nutritional choices. The study also reinforced previous reports that physical activity, quality of sleep and nutritional choices have positive associations with general health. These findings would assist institutional administration to draw up policies and advices that could be useful in educating students on how to enhance quality living. This is especially important in Caribbean medical schools where studies of this nature are not very common.

The study shows that the general health of staff is significantly better than that of students. The students might have less time to cook, thereby resulting in buying unhealthy snacks. The same could also be true of students having less time for sleep because they usually face a lot of pressure academically [2]. However, with proper education and counseling, the students can be shown how to utilize their time optimally and how to engage in healthier nutritional practices.

5.2.2 Theoretical implications

This research has contributed to knowledge in many ways. Earlier studies have shown that quality of sleep, nutritional choices and physical activity have positive correlations with general health. Our study also confirmed these

observations. This study also demonstrated that quality of sleep and nutritional choices are the best predictors of general health while physical activity contributed positively but non-significantly to the general health.

This study would hopefully spur more researches in this area in other educational institutions, especially in the Caribbean.

5.2.3 Strengths and weaknesses of the research

This study draws its strengths from the positivist research approach which is objective, impartial and deterministic. In addition, standardized instruments were used for the survey. The assumptions of the inferential statistical analysis were tested to ensure the credibility and robustness of the study.

One weakness of the study is the sample size. To overcome this, the entire student and staff population was sampled for the study and this enhanced good representation. Another weakness is the fact that any health condition that participants might have that might actually affect their nutritional choices, sleep and physical activity was not considered. For instance, persons with debilitating conditions may not be able to participate in physical activity and this could constitute a confounding variable. However, since the participants were drawn from a University where the students participated in academic programs and staff came to work without any complaints, it is assumed that the confounding variables if any, would not have much effects on the results.

5.3 Recommendations

5.3.1 Recommendations for practice and policy

1. Students and staff should be encouraged to prioritize sleep and observe better sleep practices. If they cannot make up the recommended seven hours of uninterrupted sleep at nights, they should strive to have at least six hours of uninterrupted night sleeps.
2. Students and staff should endeavor to have siestas during the day.
3. In situations where several days are spent with not-enough sleep, increased hours of sleep should be observed at least for a day during the weekend, without an alarm clock, to make up for minimal sleep during the week.
4. Fruits should be provided at the student lounge once a week to encourage students to have similar practices at home.
5. Students should be educated more on the need to consume healthy foods and snacks
6. The University should re-open the cafeteria. Healthy foods and snacks should be served in the cafeteria.
7. Students should be advised to limit the consumption of unhealthy foods such as carbonated drinks, energy drinks, caffeinated drinks and foods rich in trans-fats.
8. Students should be educated on the proper timing for food consumption, as late hour heavy meals could also cause unpleasant reactions.
9. The University should organize fitness activities as part of its extracurricular events.
10. Students should be educated to increase their daily physical activities either by carrying out specific workout routines or by walking and stretching between study periods.
11. The establishment of a Fitness Club at the University is recommended.

5.3.2 Recommendations for future research

1. Future research may consider taking the blood pressure, blood glucose and body mass index of participants and determining how the independent factors of quality of sleep, nutritional choices and physical activities affect these parameters.
2. Similar research studies should also be conducted in other Caribbean medical schools for comparison.

SUPPLEMENTARY MATERIALS

Supplementary materials available in this link:https://www.journaljammr.com/index.php/JAMMR/libraryFiles/downloadPublic/23

CONSENT AND ETHICAL APPROVAL

Approval was obtained from the All Saints University Research Committee/ Research Ethics Committee before the research was conducted. All participants' responses were kept confidential. No one was coerced, bribed or threatened to take part; each participant took part voluntarily. The write-up was checked for plagiarism. All sourced information were properly cited and referenced.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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