Health behaviours affecting academic performance among university students in Riyadh, Saudi Arabia: KSU female students as an example

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ABSTRACT

Aims

To determine whether there is an effect of healthy behaviours (diet, physical activity, sleep pattern and coping with stress strategies) on academic performance among King Saud University (KSU) female students who study in different academic fields.

Methods

A self-administered questionnaire was distributed among 14342 female students aged from 18-25 from different colleges fields, these colleges are Medical Colleges, Sciences Colleges and Humanities Colleges. We distributed the questionnaires through the students' official emails and only 310 students who completed them.

Results

The study results show, there was a very weak, positive monotonic correlation between GPA and family income (r_s=0.105, n=310, p>0.001) while, there was a very weak, negative monotonic correlation between GPA and the number of family members, marital status, and with whom they live (p<0.001). Regarding the health behaviours;

Physical activity seems to be related to academic performance among students of sciences colleges (X^2=174.34, and p<0.001) while, sleep pattern and stress are related to academic performance for medical students, (X^2=297.470, X^2=120.7 respectively and p<0.001).

Conclusion

The medical students are the most affected group by the health behaviours where sleep pattern and cope with stress are found to be the most health behaviours affecting their academic performance.

Key Words

Health behaviours, academic performance, grade point averages, healthy diet, physical activity, stress and sleep pattern.

What this study adds:

1. What is known about this subject?
There are previous studies were conducted about health behaviours (healthy diet and obesity, physical activity, sleep pattern, and stress) and their effects on students' academic performance.

2. What new information is offered in this study?
The researchers were focused on another sample in Saudi Arabia, and we compared between students who study different academic fields in one study where we found the medical students are the most affected group.

3. What are the implications for research, policy, or practice?
The healthy behaviours for students affect their academic performance positively. This research emphasis on promoting a healthy lifestyle for students rather than their grade point averages.

Background

The students' performance is a product of socio-economic, psychological and environmental factors where, the family income, parents' age, parents' education, study hours per

day and class attendance have a positive relationship with students' academic achievements.[1] Furthermore, healthier students are better learners, being healthy means that their bodies and minds function as they are supposed to.[2] A Research Initiative of the Campaign for Educational Equity Teachers College, Columbia University provided compelling evidence for the causal role that educationally relevant health disparities play in the educational achievement.[3] Higher academic performance throughout the years at university is highly associated with occupational success moreover, academic performance effects students' future educational fulfilment and income, which, in turn, affect health and quality of life.[4] Therefore, determining factors related to academic grades is important to both universities and their undergraduates.[5]

To improve, support, and justify the health promotion efforts in universities, it is helpful to understand how students' health behaviours affect their academic performance. Many factors affect students' health, some they cannot control, such as their genetic makeup or their age, but they can make changes to their lifestyle by taking steps toward healthy living, they can help reduce their risk of heart disease, cancer, stroke and other serious diseases.[6,7]

There is a great deal of interest in how students' health behaviours related to their academic performance, like sleep patterns, physical activity, eating behaviours, and stress have all suggested influencing academic performance. It has been shown that participation in physical activity, as well as more healthy diets, are beneficial to cognition, suggesting that health behaviours may affect cognitive performances.[5] In university, and especially the freshman year, is a period in which students are often subject to several health behaviours and lifestyle changes, thus, Grade Point Averages (GPA), which is often used as a measure of academic performance might be affected by such health behaviour changes during the first year at university.[5] Studies in university students have shown associations between several health behaviours (physical activity, sedentary lifestyle, and diet) and academic performance.[5,8]

Physical fitness in childhood and adolescence is beneficial for both physical and mental health throughout life, however, a growing body of evidence suggests that it may also play a key role in brain health and academic performance.[8,9] Besides, nutritional studies implicated that breakfast habits (skipping vs. consumption) were associated with nutritional status, body weight, and academic performance in children and adolescents, food insecurity affected students' academic performance and weight gain.[10]

A number of research studies highlighted the associations between obesity, healthy diet and academic performance.[11-14] In Saudi Arabia, A recent study was conducted in Riyadh showed that the female medical students who have a normal body mass index (BMI) achieve higher GPA while, who with high BMI show poor educational performance and another one reported that there is a negative relationship between the overweight and the academic performance among female high-school students while a study includes students from intermediate and high schools located in Taif city indicated that there is no correlation between BMI and academic performance except for physics where obese students perform worse than normal-weight students.[15-17]

Furthermore, College students experience several sleep problems, which may impact academic performance, health, and mood, a common sleep problem among university students is sleep deficiency and resulting excessive daytime sleepiness.[18] Young adults cannot get enough sleep if they must get up early, in addition, sleep may be voluntarily sacrificed due to social factors or involuntarily curtailed because of living in a noisy residence hall or apartment, the consequences of sleep problems, whether due to insufficient sleep or an untreated sleep disorder can be serious where sleep problems have been associated with deficits in attention and academic performance, it was reported that insomnia caused problems such as impaired concentration, impaired memory and decreased ability to accomplish the daily task.[18-20]

Regarding the effect of stress, it has been indicated that stress was negatively related to academic achievement, an optimal level of stress enhances learning while an excess of stress can cause health problems, a high level of stress may have a negative effect on cognitive functioning and learning of students.[21]

The presented research aimed to examine the effect of health behaviours affecting academic performance among university students in different fields of academic studies.

Hypothesis
The null hypothesis (H0) might be a healthy diet, physical activity, sleep pattern, and stress are not related to academic performance and an alternative hypothesis (H1) might be a healthy diet, physical activity, sleep pattern, and stress is related to academic performance.

Method

To evaluate the relationship between health behaviours and academic performance of King Saud University (KSU) female students, the researchers conducted a cross-sectional study using self-administered survey on a sample of 310 students aged from 18–25 from different colleges field.

The total undergraduate female students of the KSU was 14342, a survey questionnaire was distributed among students aged from 18–25 from different colleges field, these colleges are Medical Colleges, Sciences Colleges and Humanities Colleges (Table 1).

The questionnaire was transformed into electronic survey and Messages Centre of the University assisted the researchers to distribute it through the student's official emails and only 310 students who completed the survey.

The Study's Date Collection and Instrument: The study questionnaire was designed to include questions regarding some sociodemographic characteristics, academic performance and lifestyle behaviours including four dimensions: (healthy eating habits, physical activity, stress and sleep pattern). The researchers have designed the survey questionnaire according to different international questionnaires, The first one is called "CEVEAPEU questionnaire" an instrument to assess the learning strategies of university students,[22] only 11 questions are used out of 88 questions, another questionnaire called "ACHA-NCHA II",[23] and the third questionnaire validated by World Health Organization (WHO) that so-called "Global Physical Activity Surveillance (GPAS)", The GPAQ covers several components of physical activity, such as intensity, duration, and frequency.[24]

The Validity of the Study's Instrument: The final copy of the questionnaire has been collected and modified by the researchers and it was handed out (Pilot phase) for the definitive validation furthermore, the questionnaire was tested by well-known professors from Public Health Department, KSU.

Data analysis

Descriptive and quantitative statistics, Spearman and Pearson's correlation were used to calculate bivariate correlations. Other tests used are chi-square test (X^2), Cronbach's Alpha and frequency rate; these analyses were performed with SPSS 19.0 for windows.

The reliability of the study's instrument: The researchers used SPSS to calculate and report Cronbach's alpha coefficient for internal consistency reliability for all scales and subscales that used, an alpha of 0.743 is probably a reasonable goal, and high value for Cronbach's alpha indicates the good internal consistency of the items in the scale. The acceptable values of alpha ranging from 0.70–0.95.

Results

The study sample included a total of 310 female students, most of the students are singles (86.1 per cent), some are married (13.5 per cent), and the divorced are very rare (0.3 per cent). Most of the students (89.7 per cent) do not suffer from any disease, but the other (10.3 per cent) suffer from some diseases such as Ovaries cyst, hyperthyroidism, asthma, anaemia and some skin conditions (Table 2).

When we examined the frequency of participating in social activities impact on academic performance among the students, we found that half the students (n=71) who have GPA (3.5–4.49 out of 5) and near half of (54 per cent, n=77) who have GPA (4.5–5 out of 5) have moderate social activity practice.

Spearman's correlation was run to determine the relationship between students' GPA and other factors; there was very weak, positive monotonic correlation between GPA and family income (r_s=0.105, n=310, p>0.001) while, there was very weak, negative monotonic correlation between GPA and the number of family members, marital status, and with whom they live (p<0.001), (Table 3).

Academic performance and health dimensions:

1- Healthy Diet and Academic Performance

The null hypothesis is accepted, since (p>0.05) where diet seems to not be related to academic performance among students of humanist, sciences, and medical colleges. The researchers found that most of the humanist students do not eat healthily, only less than (30.7 per cent) of them do, however, Science students and medical students (50 per cent and 56.8 per cent, respectively) tend to eat healthier, (Table 4).

2- Physical Activity and Academic Performance

Physical activity seems to not be related to academic performance among students of humanist colleges and medical colleges, where (X^2=170.07 and X^2=194.707, respectively and p>0.001), the null hypothesis is accepted since p>0.05. While Physical activity seems to be related to academic performance among students of Sciences Colleges, (X^2=174.34, and p<0.001), the null hypothesis is rejected, since (p<0.05), (Table 5).

3- Sleep Pattern and Academic Performance

Sleep pattern seems to not be related to academic performance among students of Humanist and Sciences Colleges, where (X^2=162.075 and X^2=208.756, respectively and p>0.001), the null hypothesis is accepted, since (p>0.05). While for medical students, (X^2=297.470 and p<0.001), the null hypothesis is rejected, since (p<0.05). Science and humanist students are sleeping much better than medical students where (74.1 per cent, 68.5 per cent, and 66.4 per cent respectively) are sleeping well, (Table 6).

4- Stress and Academic Performance

Stress seems to not be related to academic performance among students of humanist and Sciences Colleges where, (X^2=113.016 and X^2=104.869, respectively and p>0.001), the null hypothesis is accepted, since p>0.05. While, the null hypothesis is rejected for medical students where (X^2=120.7, and p<0.001) therefore, stress seems to be related to academic performance among students of Medical Colleges (Table 7).

When students were asked about coping with stress, (28.1 per cent) tend to sleep, and (19.7 per cent) are preferred talking to someone, the others have different strategies to cope with stress such as watching TV or movie, dancing, eating, crying, exercise or doing a favourite hobby.

Discussion

In this study, the academic performance of medical students is affected by sleep pattern and stress while, science students affected by physical activity behaviours only. On the other hand, the academic performance of humanist students is not associated with their health behaviors, however, Previous studies show that more positive health behaviours generally were associated with better academic performance.[21,25-27]

Overall, sociodemographic results show very weak correlation between GPA and marital status (r_s=-0.096, n=310, p<0.001), Family income (r_s=0.105, n=310, p>0.001). The number of family members (r_s=-.038, n=310, p<0.001), and with whom they live (r_s=-.128, n=310, p>0.001). This finding is consistent with earlier published results which indicated that marital status and family income did not significantly differ with academic performance, however, a study conducted in Pakistan showed that large family size, tension among the family members and low socio-economic status badly effects student's educational attainment.[28-30]

Healthy (or unhealthy) lifestyle behaviours are significantly interrelated, students who take healthy meals and exercise often are associated with better health and fewer academic problems.[31] however, we found that there is no relationship between academic performance and healthy diet among the represented sample of King Saud University, some studies demonstrate an association between diet quality and academic performance, which interfere with the results of our study.[25,32]

Regarding the physical activity, our results show that physical activity seems to not be related to academic performance among students of humanist colleges and medical colleges, this result supports the result of a study indicates that the changes in muscle strength and flexibility fitness were unrelated to academic performance.[33] However, our results show that the physical activity is only related to academic performance of Science college students, this support the results of other studies which say fitness is positively related and a predictor of overall academic performance.[34-35] This inconsistency may be due to the very small sample size in our study in compared to the large population of King Saud University.

For sleep disorders, having insomnia symptoms or obstructive sleep apnoea (OSA) symptoms were associated with poor academic performance.[36] We found that the academic performance is affected by the quality of sleep pattern among Medical students only, unlikely the students from other colleges, this result is consistent with an earlier study conducted in Malaysia showed that medical students who slept more than 6 hours were observed to have significantly higher academic performance.

The present study indicates that academic performance is affected by the stress among Medical students only. Also, a published study indicated that stress was a significant problem among medical students and had a negative impact on their academic performance.[37] Therefore, a study recommends that universities should endorse sleep quality and mental health illness screening programs for students.[38]

Limitations of the study:

One major limitation of this study was the time constraint hinders the researchers from collecting the larger sample and the low response rate. Secondly, as with any cross-sectional study, the reported values may be a snapshot and not represent the full experience of this population and the presented descriptive study used self-administered questionnaire which causes low response rates and information bias especially if respondent misunderstood questions. In addition, as the researchers belong to the female section the study populations are females only.

Conclusion

The medical students are the most affected group by the health behaviours where sleep pattern and cope with stress are found to be the most health behaviour affecting their academic performance.

This study recommends that:

-   Students need to be aware of the benefits of good sleep, and regular seminars and workshops should be held on this issue to motivate the students to structure their routines in such manner make their sleep duration is not affected by their academic commitments.
-   Further studies recommended to be made to assess the knowledge about physical activity and more studies should be conducted in Saudi Arabia, Gulf and the Middle East on students' health.

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PEER REVIEW

Not commissioned. Externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

FUNDING

Table 1: Population and sample size from each field

	Total population	Sample n (%)
Medical students	2629	95 (30.6)
Sciences students	3920	120 (38.7)
Humanist students	7793	95 (30.6)
Total	14,342	310 (100)

Table 2: Demographic distribution of the sample

	n (%)
Field of study:	
- Humanitarian studies	95 (30.6)
- Sciences	120 (38.7)
- Medical	95 (30.6)
Students GPA:	
- 2- 2.49	2 (0.6)
- 2.5-3.49	24 (7.7)
- 3.5- 4.49	142 (45.8)
- 4.5-5	142 (45.8)
Marital status:	
- Single	267 (86.1)
- Married	42 (13.5)
- Divorced	1 (0.3)
Health status:	
- Healthy	278 (89.7)
- Have some Health problems	32 (10.3)
BMI	
- Underweight	35 (11.3)
- Normal	169 (54.5)
- Obese	75 (24.2)
- Very obese	31 (10)

Table 3: Spearman Rho correlation coefficient and p values for students' GPA and other selected factors

	GPA	
	Spearman Rho	P value
Marital status	-0.096	0.093
Family income	0.105	0.064
Number of family members	-0.038	0.505
With whom they live	-0.128*	0.24

*correlation is significant at the 0.05 level

Table 4: Chi-Square Tests for Diet among the study sample

	Value	df	Asymp. Sig. (2-sided)
Humanist Students:			
Pearson Chi-Square	149.590[a]	132	0.14
Likelihood Ratio	107.792	132	0.939
Linear-by-Linear Association	0.721	1	0.396
N of Valid Cases	95		
Science Students:			
Pearson Chi-Square	131.439[b]	143	0.746
Likelihood Ratio	123.859	143	0.874
Linear-by-Linear Association	0.072	1	0.788
N of Valid Cases	119		
Medical Students:			
Pearson Chi-Square	166.913[c]	154	0.225
Likelihood Ratio	132.622	154	0.893
Linear-by-Linear Association	1.611	1	0.204
N of Valid Cases	95		

[a]156 cells (100.0%) have expected count less than 5. The minimum expected count is .01.
[b]168 cells (100.0%) have expected count less than 5. The minimum expected count is .01.
[c]180 cells (100.0%) have expected count less than 5. The minimum expected count is .01.

Table 5: Chi-Square Tests for Physical activity among the study sample

	Value	df	Asymp. Sig. (2-sided)
Humanist Students:			
Pearson Chi-Square	170.071[a]	156	0.209
Likelihood Ratio	131.398	156	0.924
Linear-by-Linear Association	1.794	1	0.18
N of Valid Cases	95		
Sciences Students:			
Pearson Chi-Square	174.340[b]	143	0.038
Likelihood Ratio	131.159	143	0.752
Linear-by-Linear Association	0.001	1	0.979
N of Valid Cases	120		
Medical Students:			
Pearson Chi-Square	194.707[c]	210	0.768
Likelihood Ratio	153.545	210	0.999
Linear-by-Linear Association	4.402	1	0.036
N of Valid Cases	95		

Table 6: Chi-Square Tests for Sleep pattern among the study sample

	Value	df	Asymp. Sig. (2-sided)
Humanist Students:			
Pearson Chi-Square	162.075[a]	180	0.827
Likelihood Ratio	127.487	180	0.999
Linear-by-Linear Association	0.403	1	0.525
N of Valid Cases	95		
Sciences Students:			
Pearson Chi-Square	208.756[b]	187	0.132
Likelihood Ratio	173.186	187	0.757
Linear-by-Linear Association	0.083	1	0.773
N of Valid Cases	120		
Medical Students:			
Pearson Chi-Square	297.470[c]	210	0
Likelihood Ratio	152.248	210	0.999
Linear-by-Linear Association	7.548	1	0.006
N of Valid Cases	95		

[a]208 cells (100.0%) have expected count less than 5. The minimum expected count is .01.
[b]216 cells (100.0%) have expected count less than 5. The minimum expected count is .01.
[c]240 cells (100.0%) have expected count less than 5. The minimum expected count is .01.

Table 7: Chi-Square Tests for Stress among the study sample

	Value	df	Asymp. Sig. (2-sided)
Humanist Students:			
Pearson Chi-Square	113.016[a]	96	0.113
Likelihood Ratio	80.754	96	0.868
Linear-by-Linear Association	11.066	1	0.001
N of Valid Cases	95		
Science Students:			
Pearson Chi-Square	104.869[b]	88	0.106
Likelihood Ratio	91.476	88	0.379
Linear-by-Linear Association	11.402	1	0.001
N of Valid Cases	120		
Medical Students:			
Pearson Chi-Square	120.700[c]	84	0.005
Likelihood Ratio	81.272	84	0.564
Linear-by-Linear Association	11.256	1	0.001
N of Valid Cases	95		

[a]117 cells (100.0%) have expected count less than 5. The minimum expected count is .02.
[b]108 cells (100.0%) have expected count less than 5. The minimum expected count is .01.
[c]105 cells (100.0%) have expected count less than 5. The minimum expected count is .02.