Research Article

Correlation between Demographic and Socio-Economic Factors among Undergraduate Medical Students in Taif University, Saudi Arabia

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ABSTRACT

This research was carried out in the College of Medicine at the University of Taif, Kingdom of Saudi Arabia. It included a random sample of medical students in 4th, 5th and 6th years (males and females). Data were collected using a semi-structured, self-administered questionnaire, including comprehensive, anonymous demographic and socioeconomic data, lifestyle factors, health related quality of life using the WHOQOL-BREF questionnaire, other health-related data, social support, as assessed using the Multidimensional scale of perceived social support (MSPSS), student's academic motivation, using self-efficacy and active learning strategies scales from MSPSS questionnaire an the past year grade point average (GPA). The results showed that their GPA ranged between 1.30 and 3.90 out of 4 with a mean of 3.04 and SD of 0.52. It was abnormally distributed as evidenced by significant Shapiro-Wilk test, $p<0.001$. Multiple linear regression analysis revealed that, after control for confounding, only gender of the students (females), non-smokers, membership in charity association, having higher score of psychological domain of quality of life, better overall QOL, and higher learning strategies score were significantly associated with GPA score and they are responsible for 21.5% variability of the score (r-square=0.215). From the results it could be concluded that Academic performance of senior medical students in Taif University, manifested by GPA score is influenced by many factors (multi-factorial) that are responsible for only 21.5% of variability in grade point average (GPA).

Key words: *Correlation, Socio-Economic Factors, Medical Students, Taif University*

INTRODUCTION

Borracci et al. [1] Investigated the socio-demographic and environmental factors of success among honored graduated medical students. Results showed that these highly successful profiles were significantly associated with a number of socio-demographic characteristics, including marital status, having children, living in urban setting, being far from the family and being financed by parents. Authors also investigated a few academic, cognitive and personality-related factors and found that in students, having graduated from a prestigious high-school, giving high priority to success, believing that success is contingent to intrinsic motivation, sociability and independence and knowing how to manage stress positively influenced academic achievement.

Lumley et al. [2] reported that the students who were employed and those who had familial commitments were less likely to reach high academic grades. Such data confirm that socially advantaged students have greater chances to achieve high performance as compared with their counterparts.

Vermandele et al. [3] demonstrated that the parents' high educational level positively influenced the student's academic success, especially in first college years, and is associated with lesser attrition by comparison to students with lowly educated parents. Furthermore, the study showed that female gender is associated with higher odds of success in the first college years. Moreover, Lechien [4] demonstrated that gender factor may

indirectly influence success, and results suggested that male students are likely to be discouraged to enter medical schools where a filtering examination is implemented in the 3rd year.

A Saudi study by Al Shawwa et al. [5] explored that the association of academic performance with a range of lifestyle factors, such as hours spent on TV, social networking, time dedicated to hobbies, time spent with friends and time spent on extracurricular activities. Authors reported excessive time spent on social networking to be the only significant lifestyle factor that negatively affected academic performance (GPA<4.5). Besides lifestyle factors, authors also assessed the impact of learning strategies and found some difference in the learning patterns between high GPA (GPA≥4.5) of students and their counterparts, in addition to higher levels of motivation and study enjoyment [6].

Quality of life (QoL) was also stipulated to be an important external factor of academic achievement. Previous study by Borracci et al. [1] explored various demographic, social and quality of life-related factors in association with academic achievement and reported that high academic performance was correlated to better QoL, as well as to conditions of living being close to student's ideal. Authors also demonstrated the significant predictive role of other factors such as involvement in extracurricular activities including charity and arts, as well as research; all are thought to contribute in the student's wellbeing. Furthermore, health-related QoL was reported by authors to be correlated to sleep quality as assessed by hours of sleep; while, paradoxically, low QoL may be associated with high academic achievement, as it can be the consequence of increased hours of studying.

The aim of this study was carried out to analyze the correlation of demographic and socioeconomic factors with academic success as measured by past year grade point average.

MATERIALS AND METHODS

Study design
A cross-sectional study was implemented and conducted in the College of Medicine at the University of Taif, Kingdom of Saudi Arabia.

Study population and selection criteria
The study included a representative sample of medical students in 4th, 5th and 6th years, which were registered in the College of Medicine at the University of Taif, for the academic year 2017-2018. Number of 4th, 5th and 6th year students (males + females) for the current academic year (2016-2017) is estimated at 209, 197, and 176, respectively. The samples were taken randomly to get 96 of medical students from 4th year, 90 medical students from 5th year and in 6th years were taken 75 medical students.

Data entry and analysis
Data collection sheets were collected and verified for completeness. Variables were coded prior to entry in database, using Statistical Package for Social Sciences (SPSS) software version 23 (IBM corporation). Descriptive statistics were performed to analyze patterns on answering regarding different parts of the questionnaire. Different scores including the 4 QoL dimensions, self-efficacy and learning strategy SMTSL scores and MSPSS scores were calculated as described in their respective manuals and presented as means ± standard deviations (SD) [range]. Normality tests were carried out to analyze distribution of numerical variables, especially GPA, the primary outcome (Shapiro-Wilk test). Nonparametric tests were used to analyze GPA as it was abnormally distributed, $p < 0.001$. Association of GPA with different factors' categories was tested. Mann-Whitney test was used to compare two groups whereas Kruskal-Wallis test was applied to compare between more than two groups. Spearman`s correlation was used to analyze correlation between two numerical variables. Multivariate linear regression model was applied to define the predictors of academic success, using GPA as the dependent variable. *P-values* of <0.05 were considered for statistical significance.

Ethical considerations
Ethical approval for this study protocol was sought from the Regional Ethical Committee. A written consent was obtained from Taif University administration prior to starting data collection.

Implicit consent was assumed on voluntary participation in the study. Questionnaire was filled and collected in complete anonymously manner. Data were coded prior to entry and data base was used with respect the confidentiality, and only the researcher and the statistician had access to the completed questionnaires.

RESULTS AND DISCUSSION

Factors associated with academic performance
Universities all over the world have tried to predict the academic achievements of medical students to have more insight for better support of students as well as for making evidence-based decisions with regard to the selection of medical students [7].

Demographic and socio-economic factors
Female students had higher significant GPA than male students (mean rank was 151.68 versus 114.71), p<0.001. Students who reported longer time of transportation between home and university (>60 minutes) had higher significant GPA compared with those with shorter time (<15 minutes; mean ranks were 214.25 and 114.83, respectively; p=0.032). All other studied demographic and socio-economic factors were not significantly associated with GPA among the participants as shown in Table (1).

In univariate analysis, students who spent longer time in transportation between home and university had higher significant GPA compared to those who spent shorter time. This could be explained by the fact that most of those who spent longer time are females and they spent this time in studying while males spent it in driving. Anyway, this significance disappeared after controlling for confounding effect. These results are in agreement with Salem et al. [8] who found that among demographic and socio-economic factors investigated in the current study, only gender was significantly associated with academic performance, indicated by GPA in the past year. Female students had higher academic achievements than male students, after controlling for confounders in multivariate linear regression analysis. In agreement with our finding, Salem et al observed that female students had higher academic performance compared to males. While in [9] Parents' education level or occupation, ownership of house, type of residence, number of siblings, whether living with parents or not, place of residence, mode of travel to the college, time taken to reach college, marital status and epidemiological factors other than those related to academic issues were not associated with stress.

Chronic health problems
As demonstrated from Table (2), there was no statistically significant association between history of chronic diseases (asthma, allergy, visual impairment, hearing impairment. And others) and academic performance, indicated by GPA.

Students who lived with their families used analgesic medication more often than students lived in dormitory. On the other hand, the Spanish study by Figueiras et al. [10] showed that medication was more prevalent among persons who lived alone. The reason of this difference could be because students lived with their families in the current study may be influenced by their parents' knowledge, attitude and practice regarding medication [11, 12].

Acute diseases
There was no statistically significant association between history of significant acute diseases and GPA of the students (Table 3).

Surgery
There was no statistically significant association between history of surgery and GPA of the students (Table 4).

Lifestyle factors
Non-smoker students had the highest GPA (mean rank was 139.04) whereas daily smokers had the lowest GPA (mean rank was 71.14). The difference was statistically significant, p=0.001. Students who never tried substance abuse had higher significant GPA (mean rank=133.21) compared to those already tried (mean rank=107.19) and currently users (mean rank=14.50), p=0.043. Students who reported studying of religion-oriented materials regularly had significant higher GPA compared to those who studied them sometimes (mean rank was 210.14 versus 122.83), p=0.028. Students who had membership in charity association had higher significant GPA compared to non-members (mean ranks were 167.17 and 125.95, respectively), p=0.004. Other life style factors were not significantly associated with students' GPA; Table (5).

In the current study, few life style factors were significantly associated with higher GPA score in univariate analysis; namely non-smoking status, never drug abuse, studying of religion-oriented materials regularly and having a membership in charity association. However, in multivariate analysis, only none smokers and members in charity association were significantly associated with better academic performance. Other studied life style factors such as physical activity, eating habits, vacation and travel habit and daily smart device use for entertainment, sleep pattern and compliance with religious duties were not significantly associated with

academic performance. In another Saudi study carried out in Jeddah [5] excessive time spent on social networking was the only significant lifestyle factor that negatively affected academic performance. In addition, Walsh et al [13], indicated adverse effect of media use on academic outcomes of college students.

Table 1: Association between demographic and socio-economic characteristics and academic performance among senior medical students, Taif University

Variables	GPA			p-value
	Median	IQR	Mean rank	
Gender				
Male (n=146)	2.90	2.50-3.39	114.71	
Female (n=115)	3.30	2.90-3.50	151.68	<0.001*
Nationality				
Saudi (n=258)	3.06	2.60-3.50	130.46	
Others (n=3)	3.75	2.50-3.75	177.33	0.285*
Academic level (years)				
4th (n=96)	3.30	2.61-3.50	141.54	
5th (n=90)	3.00	2.58-3.41	121.32	
6th (n=75)	3.05	2.70-3.45	129.13	0.183**
Marital status				
Single (n=250)	3.04	2.60-3.50	130.41	
Married (n=11)	3.29	2.60-3.50	144.41	0.547*
Having children among married students (n=11)				
No (n=6)	3.38	3.09-3.71	7.25	
Yes (n=5)	2.70	2.55-3.40	4.50	0.177*
Accommodation				
Urban (n=252)	3.02	2.60-3.50	129.87	
Rural (n=9)	3.45	2.95-3.50	162.78	0.198*
Town of origin				
Taif (n=240)	3.09	2.60-3.50	132.64	
Makkah/Jeddah (n=15)	3.00	2.50-3.36	109.60	
Others (n=6)	3.15	2.16-3.49	118.75	0.477**
Residence				
With parents (n=234)	3.10	2.60-3.50	134.32	
With spouse (n=8)	2.30	2.60-3.48	126.69	
University campus (n=1)	3.00	---	117.00	
Alone (n=18)	2.82	2.42-3.18	90.47	0.127**
Number of house occupants (family size)				
≤5 (n=103)	3.00	2.60-3.40	124.17	
6-9 (n=139)	3.20	2.63-3.50	137.83	
≥10 (n=19)	3.00	2.50-3.50	118.00	0.280**
Number of siblings				
None (n=7)	3.00	2.75-3.40	129.93	
1-3 (n=50)	3.00	2.62-3.50	133.03	
4-6 (n=127)	3.20	2.70-3.52	139.66	
>6 (n=77)	3.00	2.50-3.40	115.50	0.175**
Number of university-graduated siblings				
None (n=76)	3.00	2.60-3.38	121.30	
1-3 (n=122)	3.20	2.66-3.53	140.51	
>3 (n=63)	3.02	2.60-3.43	124.29	0.157**
Family monthly income in SAR				
<5000 (n=37)	3.00	2.44-3.48	120.05	
5000-1000 (n=12)	3.15	2.74-3.50	138.17	
10001-20000 (n=30)	2.65	2.50-3.39	102.22	
>20000 (n=80)	3.19	2.77-3.50	141.54	
Don`t know (n=102)	3.13	2.60-3.50	134.33	0.135**
Father's educational level				
Illiterate (n=10)	3.01	2.16-3.43	109.00	
Primary/intermediate (n=38)	3.20	2.69-3.50	137.68	
Secondary (n=53)	3.00	2.50-3.38	117.36	
University (n=160)	3.14	2.60-3.50	135.31	0.333**
Mother's educational level				
Illiterate (n=25)	3.00	2.63-3.61	132.50	
Primary/intermediate (n=61)	3.00	2.50-3.41	116.74	
Secondary (n=46)	3.07	2.70-3.47	132.65	
University (n=129)	3.20	2.61-3.50	136.86	0.393**

Source of financial support				
Parents (n=229)	3.07	2.60-3.50	131.16	
Self (n=22)	2.98	2.59-3.39	128.55	
Others (n=10)	3.13	2.60-3.50	137.75	0.985
Mean of transportation				
Private car (n=154)	3.00	2.54-3.41	121.22	
Family car (n=91)	3.30	2.70-3.50	143.75	
Public transportation (n=7)	3.20	2.88-3.42	140.00	
University transportation (n=9)	3.39	3.00-3.51	162.44	0.077**
Time between home and university (minutes)				
<15 (n=41)	3.00	2.50-3.35	114.83	
15-30 (n=141)	3.00	2.60-3.50	127.26	
31-60 (n=75)	3.20	2.70-3.50	142.44	
>60 (n=4)	3.60	3.38-3.78	214.25	0.032**

* Mann-Whitney test   ** Kruskal-Wallis test of health-related problems

Table 2: Association between history of chronic health problems and academic performance among senior medical students, Taif University

Variables	GPA			p-value*
	Median	**IQR**	**Mean rank**	
Bronchial asthma				
No (n=244)	3.10	2.60-3.50	133.08	
Yes (n=17)	2.83	2.53-3.18	101.12	0.091
Allergy				
No (n=204)	3.10	2.63-3.50	134.06	
Yes (n=57)	3.00	2.50-3.45	120.06	0.216
Visual impairment				
No (n=150)	3.00	2.60-3.50	129.01	
Yes (n=111)	3.16	2.63-3.47	133.69	0.620
Hearing impairment				
No (n=252)	3.06	2.60-3.50	131.61	
Yes (n=9)	3.20	2.50-3.35	113.89	0.489
Others				
No (n=232)	3.06	2.60-3.50	131.36	
Yes (n=29)	3.00	2.67-3.43	128.14	0.828

Table 3: Association between history of significant acute diseases and academic performance among senior medical students, Taif University

Acute disease	GPA			p-value*
	Median	**IQR**	**Mean rank**	
No (n=246)	3.09	2.60-3.50	132.70	
Yes (n=15)	2.95	2.40-3.45	103.10	0.140

* Mann-Whitney test

Table 4: Association between history of surgery and academic performance among senior medical students, Taif University

Surgery	GPA			p-value*
	Median	**IQR**	**Mean rank**	
No (n=239)	3.06	2.60-3.50	131.21	
Yes (n=22)	3.06	2.55-3.47	128.77	0.885

* Mann-Whitney test

Quality of life

The term, quality of life (QOL), was first used in the US after the Second World War to explain that having a good life is of more value than just being financially well off [14]. QOL is explained by the World Health Organization (WHO) as the individual's perception of his/her position in life within the context of culture and system of values where the individual lives, and in association with his goals, expectations, standards, and concerns [15]. QOL issues have become steadily more important so that the measurement of health should comprise not only an indication of changes in the frequency and severity of diseases but also an estimation of well-being, which can be evaluated by measuring the improvement in the QOL associated with health [16]. Health-related QOL (HRQOL) is a multidimensional concept that consists of domains assoviated with physical,

mental, emotional, and social functioning. It goes beyond the direct measures of population health, life expectancy, and causes of death to focus on the influence of the status of health on the QOL [17].

The most frequently used multi-item HRQOL instruments evaluate physical function, role limitations because of physical health problems, bodily pain, general health vitality, social functioning, role limitations because of emotional issues, and emotional well-being, and can be aggregated into two measures of physical component summaries (PCSs) and mental component summaries (MCSs) [17].

Physical domain

QOL is one's subjective perception of one's own well-being within one's sociocultural context. HRQOL measures make it possible to reveal scientifically the influence of QOL on health [18].

As shown in figure (1), there was a positive significant correlation between physical domain score of QoL and GPA score of the students, Spearman correlation coefficient (r)=0.129, p=0.037.

Table 5: Association between life style factors and academic performance among senior medical students, Taif University

Variables	GPA			p-value
	Median	**IQR**	**Mean rank**	
Smoking				
No (n=200)	3.20	2.70-3.50	139.04	
Yes, Occasionally (n=31)	3.00	2.55-3.50	123.35	
Yes, daily (≤10 cigarettes) (n=16)	2.72	2.44-3.30	97.69	
Yes, daily (>10 cigarettes) (n=14)	2.50	2.50-2.93	71.14	0.002**
Substance abuse				
Never tried (n=246)	3.10	2.62-3.50	133.21	
Already tried (n=13)	2.90	2.50-3.47	107.19	
Currently use (n=2)	2016	2.16-2.16	14.50	0.043**
Physical exercise				
None (n=79)	3.17	2.60-3.50	134.66	
<once per month (n=79)	2.98	2.53-3.39	115.27	
One per week (n=53)	3.07	2.67-3.58	133.73	
≥2 times per week (n=50)	3.27	2.75-3.53	147.19	0.112**
Eating habits				
Unhealthy (n=54)	3.00	2.52-3.45	122.98	
Not very healthy (n=93)	3.00	2.60-3.41	127.25	
Rather healthy (n=110)	3.23	2.69-3.50	140.32	
Very healthy (n=4)	2.63	2.49-2.94	70.13	0.163**
Vacation/travel				
Never (n=39)	3.00	2.50-3.50	128.59	
Rarely (n=76)	3.09	2.50-3.49	126.36	
Sometimes (n=110)	3.00	2.62-3.44	129.56	
Often (n=36)	3.14	2.70-3.70	147.79	0.542**
Daily smart device use for entertainment				
<2 hours (n=24)	3.05	2.71-3.50	146.42	
2-4 hours (n=85)	3.20	2.60-3.60	138.28	
4-6 hours (n=105)	3.02	2.60-3.44	127.37	
>6 hours (n=47)	2.98	2.66-3.31	118.07	0.332**
Sleep Pattern				
Usual sleep time				
≤12 pm (n=136)	3.10	2.61-3.49	131.78	
>12pm-2 am (n=92)	3.01	2.60-3.51	133.17	
>2 am (n=33)	3.00	2.60-3.40	121.73	0.745**
Usual wake-up time				
<8 am (n=185)	3.00	2.60-3.50	129.44	
8-10 am (n=17)	3.00	2.55-3.63	130.38	
>10 am (n=59)	3.29	2.75-3.43	136.08	0.840**
Average hours of sleep				
<6 (n=85)	3.00	2.60-3.44	120.66	
6-8 (n=165)	3.11	2.66-3.50	135.37	
>8 (n=11)	3.20	2.90-3.50	145.27	0.280**
Sleep quality				
Poor (n=14)	3.05	2.50-3.33	116.39	
Unsatisfactory (n=71)	3.07	2.60-3.50	128.41	
Acceptable (n=133)	3.06	2.63-3.50	132.89	

Good (n=43)	3.00	2.70-3.50	134.17	0.857**
Spiritual/religious habits				
Compliance with religious duties				
Poor (n=13)	2.80	2.16-3.45	100.54	
Unsatisfactory (n=45)	3.00	2.50-3.36	116.74	
Acceptable (n=104)	3.11	2.623.50	134.52	
Good (n=99)	3.10	2.63-3.50	137.78	0.191**
Study of religion-oriented materials				
Rarely (n=118)	3.10	2.60-3.50	137.87	
Sometimes (n=108)	3.00	2.60-3.45	122.83	
Often (n=28)	3.11	2.78-3.42	134.82	
Regularly (n=7)	3.70	3.34-3.80	210.14	0.028**
Membership in charity association				
No (n=229)	3.00	2.60-3.45	125.95	
Yes (n=32)	3.39	3.00-3.70	167.17	0.004*

* Mann-Whitney test   ** Kruskal-Wallis test

Psychological domain

As it can be seen in figure (2), there was a positive significant correlation between psychological domain score of QoL and GPA score of the students, Spearman correlation coefficient (r)=0.169, p=0.006.

In the current study, there was a positive significant correlation between both physical and psychological domains of QoL and GPA of the students in the univariate analysis. However, in the multivariate analysis, only psychological domain remained in the best fit model. Moreover, there was a significant association between overall QoL score and GPA in both univariate and multivariate analyses. Lumley et al. [2] in their study observed that better QoL was significantly correlated with higher academic performance. They attributed this to the correlation between QoL and sleep quality as assessed by hours of sleep.
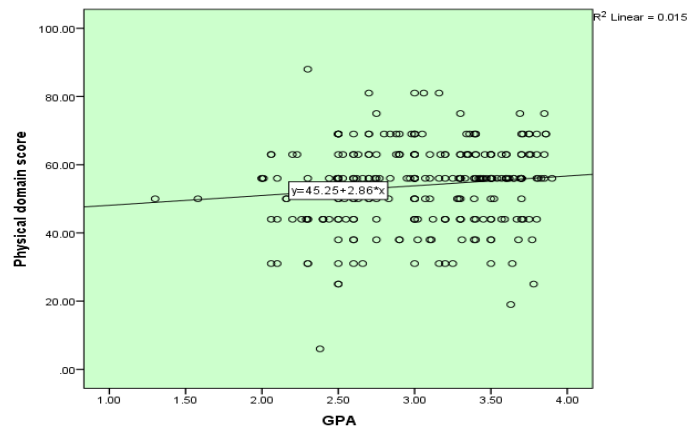

Figure 1: Correlation between the score of the physical domain of QoL and GPA score among senior medical students, Taif University
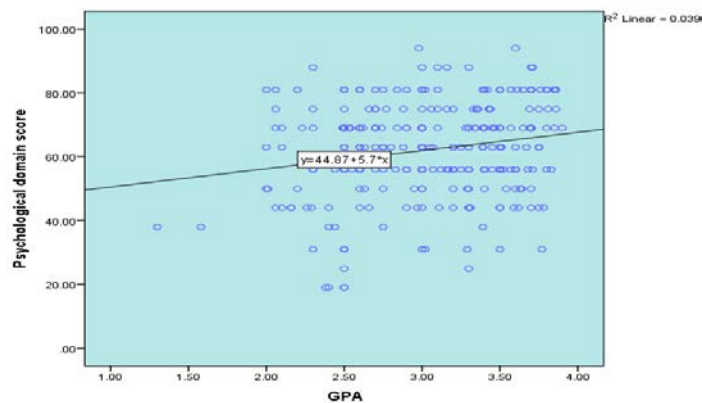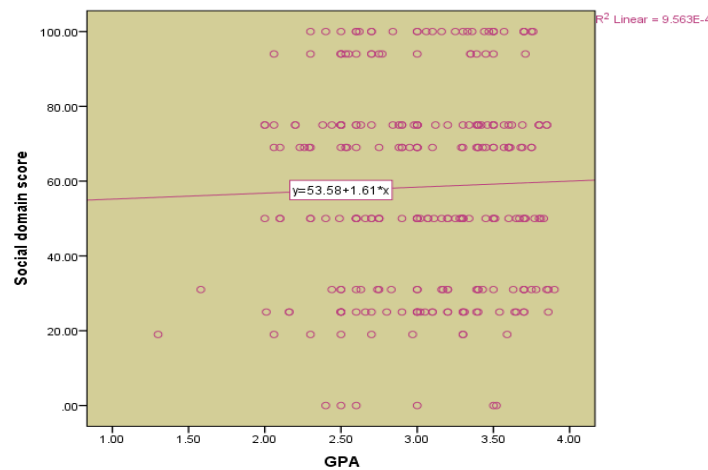

Figure 2: Correlation between the score of the psychological domain of QoL and GPA score among senior medical students, Taif University

Social domain

There are few studies on the socioeconomic status (SES) of family and QOL. Economic support from the family is necessary in a student's life. We associate the scores of HRQOL of students with family incomes per month, as a direct measure of SES. Students with a total family income of >10,000 SR per month had higher scores than those on incomes <5000 SR. This was in agreement with the research of Belgrade University students in which the total SF-36 score was significantly correlated with the average monthly family income ($P = 0.002$) [19].

As illustrated in figure (3), there was no significant correlation between social domain score of QoL and GPA score of the students, Spearman correlation coefficient (r)=0.026, p=0.678

Figure 3: Correlation between the score of the social domain of QoL and GPA score among senior medical students, Taif University

Environmental domain

As displayed in Figure (4), there was no significant correlation between environmental domain score of QoL and GPA score of the students, Spearman correlation coefficient (r)=0.030, p=0.628

Many studies have approved the association between the academic achievement and environmental factors [20-22]. However, this study did not find an association between environmental domain of Qol and academic performance.
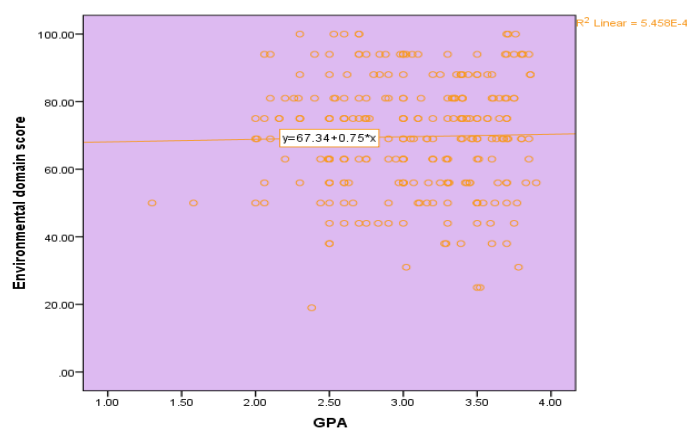

Figure 4: Correlation between the score of the environmental domain of QoL and GPA score among senior medical students, Taif University

Overall QoL score.

There was a statistically significant association between overall QoL score and GPA as the highest GPA was observed among students with relatively high QoL score (mean rank=152.08) Table (6).

Shareef et al. [23] used the same questionnaire used in the present study to assess the relation between QoL and academic performance among medical students (WHOQOL-BREF) and revealed that students with higher academic performance scored higher in all domains of QoL, and male students are better than female students in physical and psychological health domains.

Table 6: Association between overall quality of life score and academic performance among senior medical students, Taif University

Overall QoL score	GPA			p-value*
	Median	**IQR**	**Mean rank**	
Poor (n=18)	3.01	2.50-3.50	124.17	
Moderate (n=183)	3.00	2.60-3.45	124.76	
Relatively high (n=60)	3.32	2.81-3.66	152.08	0.048

* Kruskal-Wallis test

Perceived social support

There was a significant positive correlation between GPA and perceived social support score (Spearman`s correlation coefficient "r" =0.122, p=0.049); Figure (5).
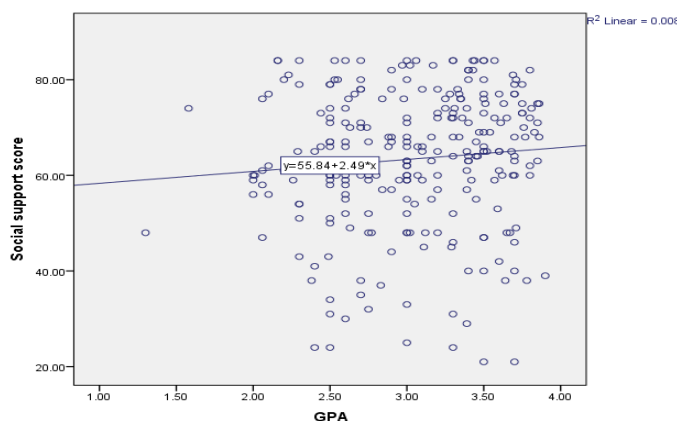

Figure 5: Correlation between GPA and perceived social support score among senior medical students, Taif University.

Student's academic motivation

Self-efficacy in learning

There was a significant positive correlation between GPA and score of self efficacy of learning (Spearman`s correlation coefficient "r" =0.254, p<0.001); Figure (6).
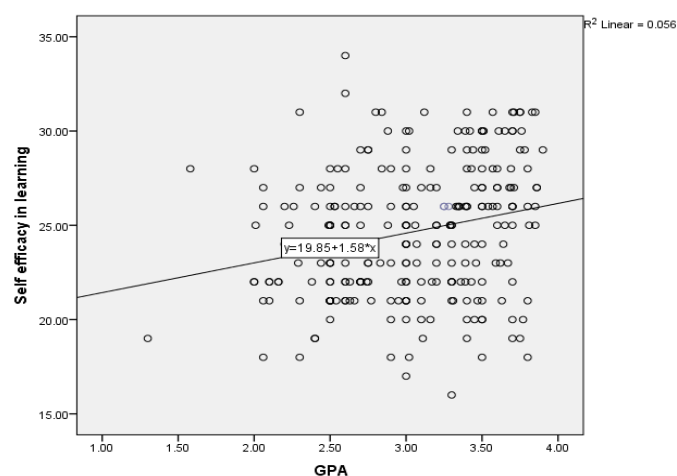

Figure 6: Correlation between GPA and self efficacy of learning among senior medical students, Taif University.

Self-efficacy in learning

There was a significant positive correlation between GPA and score of learning strategies score (Spearman`s correlation coefficient "r" =0.335, p<0.001); Figure (7).
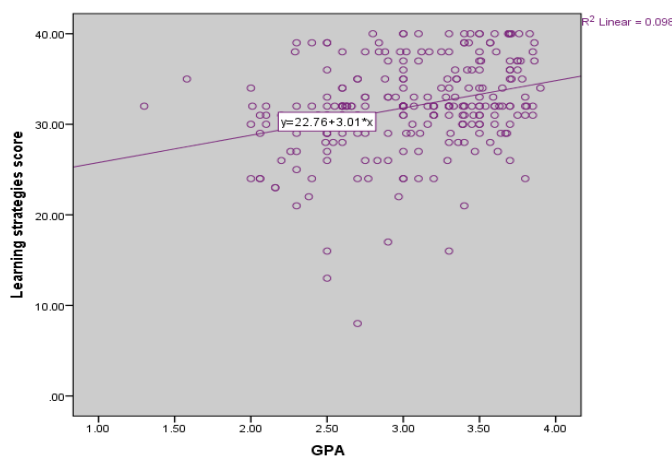

Figure 7: Correlation between GPA and learning strategies score among senior medical students, Taif University.

Factors affecting GPA among senior medical students:

Multiple linear regression analysis revealed that, after control for confounding, only gender of the students (females), non-smokers, membership in charity association, having higher score of psychological domain of quality of life, better overall QOL, and higher learning strategies score were significantly associated with GPA score, and they are responsible for 21.5% variability of the score (r-square=0.215); Table (7).

Table 7: Best fitting linear regression model for factors affecting GPA score among senior medial students, Taif University.

	Un-standardized Coefficients		Standardized Coefficients	t-value	p-value	95% CI for B	
	B	SE	Beta			Lower	Upper
Constant	1.815	.282		6.423	.000	1.258	2.371
Gender	.161	.062	.154	2.596	.010	.039	.283
Smoking	-.089	.037	-.142	-2.408	.017	-.162	-.016
Membership in charity association	.208	.090	.132	2.323	.021	.032	.385
Psychological domain of QoL	.007	.003	.201	2.515	.013	.002	.012
Overall QoL score	-.010	.005	-.164	-2.087	.038	-.019	-.001
Self efficacy in learning score	.016	.010	.108	1.687	.093	-.003	.035
Learning strategies score	.023	.007	.222	3.504	.001	.010	.036

r-square = 0.215   Model ANOVA: F=9.87, p<0.001   SE: Standard error

Variables of study of religion-oriented materials, substance abuse, social support, time between home and university (minutes) and physical domain of quality of life were excluded from the best fit model. Based on the results organizing a medical college preparation course could be recommended to prepare new students to perform different skills such as note taking, critical thinking, and active reading, and identify their effective study habits to help them in their future medical education. Further studies including students from different institutions and investigating other important factors that could influence academic performance such as students' stress, personality, confidence in career development, and interest in area of studies as well as the evaluation system should be done. Findings of the present study should be submitted to the decision makers who are responsible for selection of medical students.

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