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Assessment of Quality of Life among Medical Students in Saudi Arabia: A Study Based on WHO-QOL-BREF Protocol

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ABSTRACT

Objectives: *Medical students may experience stressful condition due to their curriculum burden and career responsibilities. Adverse physical and mental health leads to impaired quality of life of medical students which may affect their learning and academic capabilities during medical education.* ***Aim of the study:*** *The purpose of this study was to assess the quality of life-based on WHO-QOL-BREF protocol among medical students studying in Riyadh, Saudi Arabia.* ***Methods:*** *A cross-sectional study was conducted among medical students at the College of Medicine, Al-Imam Muhammad Ibn Saud Islamic University, Riyadh during the year 2014. The data for quality of life was collected by a well-designed questionnaire as prescribed by the WHO-QOL-BREF which includes questions pertaining to different domains for the quality of life.* ***Results:*** *Total 983 male medical students from different academic year participated in this study, who voluntarily filled their questionnaires for quality of life. The overall Cronbach's a coefficient of the WHO-QOL-BREF questionnaire was 0.837. Students staying with family had a higher overall QOL score than those living alone ($p<0.05$). The scores according to different academic years were significantly different in the environmental health domain ($p<0.05$); in which second-year students had the least score and fifth-year students had the highest score.* ***Conclusion:*** *In this study, we found that the medical students were found to have a decreased quality of life. Students who lived with family led to an improvement in the quality of life in some domains. There is a need for psychological support for students living alone and those in the middle of their medical course.*

Keywords: Quality of life, Medical students, Saudi Arabia

INTRODUCTION

World Health Organization (WHO) defines Quality of life (QOL) as, ''an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns'' [1]. During the course of medical education, students are subjected to a pressure of their curriculum having an expectation to get a successful medical career and to cope with the future uncertainties regarding medical practice and its associated employment. Social, emotional, physical and family problems were faced by the students which may affect their academic performance and learning abilities [2,3]. Physical and mental health problems, a reduction in student's self-esteem are generally caused by too much stress, which may affect a student's academic achievement [4,5]. In addition to educating in a professional medical course, it is also very important to take into consideration the quality of life of the students in the duration of medical training.

There are some previous studies which have assessed the QOL of medical students with the WHOQOL-BREF, but no such kind of study was conducted in Saudi Arabia [6,7]. Mental stress during education can have a negative impact on learning and cognitive functioning of students [8]. Several studies from different western countries have reported high rates of psychological morbidity among students, such as depressive symptoms and anxiety as well as from other parts of the world [9-13]. Higher levels of stress are presented by medical students when compared with other young students of the same age in other academic courses [14]. Due to the distress in medical students, the harmful outcomes include decreased cognitive functioning and learning abilities, depression, burnout, alcohol and other substance abuse, dropout, suicidal ideation, and professional ramifications, such as ethical misconduct, all of which can adversely affect medical student's health-related quality of life (HR-QOL) [15,16]. This mental distress

is associated with poor academic performance and quality of care [17-19]. Research on quality of life has become increasingly relevant since the shift in the paradigm of health proposed by the World Health Organization (WHO) in 1946 which established multi-dimensional and subjective attributes towards the concept of health [20].

There are very limited studies based on the health-related quality of life of medical students during their medical training in Saudi Arabia. The present study aims the assessment of health-related quality of life of medicals students studying in different academic years in a medical college of Saudi Arabia through the prescribed protocol of World Health Organization for Quality of Life (WHOQOL-BREF) and also to explore its associations with demographic variables, social habits, and behaviors.

METHODOLOGY

Study Setting and Population

College of Medicine at Al-Imam Muhammad Ibn Saud Islamic University, Riyadh, Kingdom of Saudi Arabia follows a modern curriculum including Problem Based Learning (PBL). Most medical students are admitted directly from high school. Before the beginning of the medical training, students have to study 1 year as the preparative year which includes completely basic sciences. Duration of medical education is 5 years, which is divided into an initial 3 years as a preclinical module, last 2 years as a clinical module and 1 year of internship. During the first year of the preclinical module students are assigned 70% courses of basic sciences and 30% courses of clinical sciences; while in year 2 and 3, students are assigned 30% courses of basic sciences and 70% courses of clinical sciences. The clinical module includes completely clinical medicine which includes courses like internal medicine, surgery, pediatrics, gynecology, and obstetrics. Students are exposed to the treatment of patients in different hospital settings mostly in their clinical years.

This is a cross-sectional study which was conducted in the year 2014. Students were selected using cluster sampling method. Copies of the questionnaires were sent to student leaders of each academic year who were being trained in the questionnaire and surveying process and he distributed the questionnaires to all students. The students were given free time to complete the questionnaire independently. This study was approved by the institutional ethical committee. All students were informed regarding the purpose of the study and later their informed consent was taken.

Instruments

Two instruments were used for data collection:

- A socio-demographic questionnaire to obtain information of age, hometown location, interest in the area of study, confidence in career development
- The Arabic version of the WHOQOL-BREF questionnaire based on a brief version of the World Health Organization Quality of Life Instrument (WHOQOL-BREF).

The WHOQOL-BREF is an international cross-culturally comparable quality of life assessment instrument [21]. It is available in different languages for both developed and developing countries and it is a generic QOL instrument developed by WHO and is composed of 26 items [22,23]. The response options range from 1 (very dissatisfied/very poor) to 5 (very satisfied/very good). It emphasizes the subjective responses rather than the objective life conditions, with assessments made over 4 weeks. The questionnaire includes four domains: physical health, psychological health, social relations, and environment according to which scores of quality of life were recorded and analyzed. The components of each domain are mentioned in Table 1. The scores are transformed into a linear scale between 0 and 100, with 0 being the least favorable and 100 being the most favorable.

Table 1 Different domains for the quality of life and their components according to WHO-QOL-BREF protocol

Domain	Components within domains
Physical health	Activities of daily living
	Dependence on medicinal substances and medical aids
	Energy and fatigue
	Mobility
	Pain and discomfort
	Sleep and rest
	Work Capacity

Psychological	Bodily image and appearance
	Negative feelings
	Positive feelings
	Self-esteem
	Spirituality/Religion/Personal beliefs
	Thinking, learning, memory, and concentration
Social relationships	Personal relationships
	Social support
	Sexual activity
Environment	Financial resources
	Freedom, physical safety and security
	Health and social care: accessibility and quality
	Home environment
	Opportunities for acquiring new information and skills
	Participation in and opportunities for recreation/leisure activities
	Physical environment (pollution/noise/traffic/climate)
	Transport

Statistical Analysis

Data recorded on a predesigned proforma was entered in a Microsoft Excel spreadsheet. All the entries were double-checked for possible typing errors. Demographic characteristics of the study sample were defined. Cronbach's α-coefficient was calculated to determine the internal consistency. Bivariate analysis was done to delineate factors associated with total and domain scores using independent samples t-test or ANOVA. The QOL of the study sample was then compared using one-way ANOVA and student's t-test according to different years, accommodation and age group. Post-hoc tests were then used to make multiple comparisons between different groups. The criterion of significance was set at $p<0.05$. All calculations were done using IBM SPSS statistics version 20.

RESULTS

Socio-demographic Characteristics of the Participants

Total of 983 male students returned the completed questionnaire with the response rate of more than 80%. Table 2 shows the social-demographic characteristics of medical students. The mean age of students was 22.0 ± 2.0 years and the range of the age was 17-36 years. Most of the students belong to the age group of 17-22 years and least students belong to the age group of 38-42 years. Maximum students were from academic year 2 (40.1%) and minimum from academic year 5 (1.3%). Most of the students (54.2%) were living with their families, 34.1% of students were living in a hostel and 1.6% of students were living alone.

Table 2 Social demographic characteristics of medical students in the study

Variables	**(N=983) n (%)**
Age (yrs.) [Mean ± SD]	22.0 ± 2.0
Range of Age (yrs.)	17-36
Age Group	
17-22 yrs	748 (76.2)
23-27 yrs	218 (22.2)
28-32 yrs	12 (1.3)
33-37 yrs	3 (0.2)
38-42 yrs	2 (0.1)
Academic Year	
Year 0	24 (2.5)
Year 1	254 (25.8)
Year 2	439 (44.7)
Year 3	196 (19.9)
Year 4	56 (5.7)
Year 5	14 (1.4)

Accommodation	
With family	593 (60.4)
Hostel	373 (37.9)
Alone	17 (1.7)

Frequency Distribution of the Medical Students according to Different Components of QOL Domains

Table 3 represents the frequency distribution of the medical students according to different components of QOL domains and overall scores. The overall QOL score was significantly associated with living arrangement and age. Students staying with family ($p<0.001$) and younger students had better overall QOL ($p<0.001$). General health was significantly associated with living arrangement and year of study; students living alone ($p<0.001$) and fourth-year students had better general health scores ($p<0.001$) as compared to the others. Psychological health was better in those who were staying with family ($p<0.001$). Social relationships scores were better among students of preparatory year and fourth year ($p<0.001$). Environment domain scores were better in students living with family ($p<0.001$) and in students of the preparatory and fifth year ($p<0.001$).

Table 3 Frequency distribution of the medical students according to different components of QOL domains

Variables	Number of students	QOL Scores (Mean ± SD)	p-value*
Overall QOL			
Living in Riyadh			
Yes	592	3.47 ± 1.21	0.240
No	373	3.38 ± 1.23	
Living Arrangement			
With family	765	3.49 ± 1.21	0.010
Alone	218	3.26 ± 1.24	
Age			
18-20 years	332	3.54 ± 1.17	0.006
21-22 years	416	3.49 ± 1.25	
≥ 23 years	235	3.22 ± 1.19	
Year of Study			
Preparatory year	24	3.83 ± 1.17	0.160
First year	254	3.56 ± 1.17	
Second year	439	3.39 ± 1.25	
Third year	196	3.32 ± 1.17	
Fourth year	56	3.55 ± 1.33	
Fifth year	14	3.43 ± 1.16	
General Health			
Living in Riyadh			
Yes	592	2.30 ± 1.17	0.740
No	373	2.44 ± 1.16	
Living Arrangement			
With family	765	2.31 ± 1.16	0.020
Alone	218	2.51 ± 1.19	
Age			
18-20 years	332	2.37 ± 1.22	0.460
21-22 years	416	2.30 ± 1.15	
≥ 23 years	235	2.42 ± 1.15	
Year Of Study			
Preparatory year	24	1.77 ± 1.19	0.020
First year	254	2.27 ± 1.20	
Second year	439	2.44 ± 1.17	
Third year	196	2.31 ± 1.13	
Fourth year	56	2.56 ± 1.14	
Fifth year	14	2.07 ± 1.07	
Physical Health			

Living in Riyadh			
Yes	592	55.08 ± 14.66	0.010
No	373	52.84 ± 13.18	
Living Arrangement			
With family	765	54.59 ± 14.29	0.130
Alone	218	52.95 ± 13.72	
Age			
18-20 years	332	54.55 ± 14.76	0.350
21-22 years	416	54.63 ± 13.78	
≥ 23 years	235	53.07 ± 14.00	
Year of Study			
Preparatory year	24	56.85 ± 16.75	0.010
First year	254	55.29 ± 13.73	
Second year	439	52.99 ± 14.35	
Third year	196	53.97 ± 13.51	
Fourth year	56	56.44 ± 14.85	
Fifth year	14	64.03 ± 13.76	
Psychological Domain			
Living in Riyadh			
Yes	592	57.85 ± 16.10	0.180
No	373	59.26 ± 15.65	
Living Arrangement			
With family	765	59.39 ± 15.78	<0.001
Alone	218	54.80 ± 16.35	
Age			
18-20 years	332	58.53 ± 15.65	0.520
21-22 years	416	58.80 ± 16.22	
≥ 23 years	235	57.36 ± 16.18	
Year of Study			
Preparatory year	24	66.84 ± 18.45	0.060
First year	254	59.29 ± 16.12	
Second year	439	57.14 ± 15.31	
Third year	196	58.74 ± 16.02	
Fourth year	56	58.33 ± 19.27	
Fifth year	14	60.71 ± 13.65	
Social Relationships			
Living in Riyadh			
Yes	592	58.02 ± 20.87	0.790
No	373	57.66 ± 20.25	
Living Arrangement			
With family	765	58.50 ± 20.47	0.050
Alone	218	55.47 ± 20.89	
Age			
18-20 years	332	57.10 ± 21.57	0.680
21-22 years	416	58.43 ± 20.57	
≥ 23 years	235	57.77 ± 19.22	
Year of Study			
Preparatory year	24	64.93 ± 26.24	0.020
First year	254	59.12 ± 21.34	
Second year	439	55.62 ± 20.32	
Third year	196	58.59 ± 19.88	
Fourth year	56	63.24 ± 18.17	
Fifth year	14	58.93 ± 16.81	
Environment			

Living in Riyadh			
Yes	592	56.86 ± 15.40	0.150
No	373	55.40 ± 15.47	
Living Arrangement			
With family	765	57.01 ± 15.47	0.002
Alone	218	53.37 ± 15.09	
Age			
18-20 years	332	57.17 ± 15.44	0.120
21-22 years	416	56.39 ± 15.98	
≥ 23 years	235	54.52 ± 14.41	
Year of Study			
Preparatory year	24	63.41 ± 15.62	0.003
First year	254	58.45 ± 15.34	
Second year	439	54.56 ± 15.57	
Third year	196	55.55 ± 15.09	
Fourth year	56	56.75 ± 15.32	
Fifth year	14	61.61 ± 11.26	
*Student's t-test or ANOVA as applicable			

In multivariate analysis (Table 4), it was found that overall QOL was significantly associated with the only living arrangement, i.e., students staying with family had a higher score than those living alone ($p<0.05$). For the general health domain, not being a resident of Riyadh ($p<0.05$) and living alone ($p=0.03$) were significantly associated with a higher score, whereas for physical health domain, being a resident of Riyadh was significantly associated with higher score ($p<0.05$) and for psychological domain ($p<0.001$) and environmental domain ($p<0.001$), living with family was significantly associated with a higher score. Social relationships domain was not associated with any of the factors studied.

Table 4 Multiple linear regression models for the WHO QOL-BREF domain scores

Variables	Beta	t-test	Sig.	Lower Bound	Upper Bound	Model ANOVA F	p-value
Overall QOL							
Living in Riyadh	-0.040	-1.150	0.250	-0.250	0.070	3.500	0.008
Living arrangement	-0.080	-2.360	0.020	-0.410	-0.040		
Age	-0.080	-2.010	0.050	-0.250	0.000		
Year of study	0.000	-0.060	0.950	-0.100	0.090		
General Health							
Living in Riyadh	0.070	2.030	0.040	0.010	0.310	2.500	0.040
Living arrangement	0.070	2.160	0.030	0.020	0.380		
Age	-0.030	-0.740	0.460	-0.160	0.070		
Year of study	0.050	1.400	0.160	-0.030	0.160		
Physical Health							
Living in Riyadh	-0.080	-2.350	0.020	-4.060	-0.360	2.700	0.020
Living arrangement	-0.050	-1.510	0.130	-3.860	0.510		
Age	-0.060	-1.570	0.120	-2.560	0.290		
Year of study	0.050	1.240	0.220	-0.410	1.840		
Psychological Domain							
Living in Riyadh	0.040	1.090	0.280	-0.930	3.230	3.400	0.009
Living arrangement	-0.110	-3.240	<0.001	-6.520	-1.600		
Age	-0.010	-0.310	0.760	-1.860	1.350		
Year of study	-0.020	-0.520	0.600	-1.600	0.930		
Social Relationships							
Living in Riyadh	-0.020	-0.470	0.640	-3.360	2.050	0.800	0.490
Living arrangement	-0.060	-1.770	0.080	-6.080	0.320		
Age	0.020	0.540	0.590	-1.520	2.660		
Year of study	-0.010	-0.210	0.840	-1.820	1.470		

Environment							
Living in Riyadh	-0.050	-1.560	0.120	-3.610	0.410	4.000	0.003
Living arrangement	-0.090	-2.910	<0.001	-5.900	-1.140		
Age	-0.040	-1.080	0.280	-2.400	0.700		
Year of study	-0.040	-0.930	0.350	-1.810	0.640		

Comparative Analysis Of QOL Scores Between Different Domains

Table 5 shows the scores of quality of life according to WHO-QOL-BREF standard in different domains for students according to their academic years. These scores were found to be different in each domain for different academic years but only scores of environment health domain were found to be statistically significant ($p<0.05$). For the physical health domain, students of preparative (0) year had the maximum score. For the psychological health domain, students of year 3 have the maximum score. For the domain of the social relation, students of year 3 had the maximum score. For the environment health domain, students of year 5 have the maximum score.

Table 5 Scores of medical students in different years

WHOQOL-BREF Domains	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	F-value	p-value
Physical health	56.83 ± 10.52	54.72 ± 14.66	53.90 ± 14.63	54.22 ± 14.40	55.73 ± 13.26	53.29 ± 9.89	0.386	0.859
Psychological health	57.25 ± 12.56	57.67 ± 15.78	58.89 ± 16.78	59.24 ± 15.66	58.07 ± 13.81	52.71 ± 15.43	0.672	0.645
Social relations	62.0 ± 20.95	58.87 ± 20.95	56.92 ± 21.14	56.60 ± 19.75	60.09 ± 19.87	63.50 ± 18.47	0.972	0.434
Environment	51.46 ± 12.98	49.14 ± 14.38	46.38 ± 13.42	47.97 ± 13.05	50.48 ± 15.37	52.36 ± 14.24	2.504	0.024*
*significant, $p<0.05$								

Table 6 shows the scores of quality of life according to WHO-QOL-BREF standard in different domains for students according to their accommodation. These scores were found to be different in each domain according to accommodation but not found to be significant. For the physical health domain, students living with their family had the maximum score. For the psychological health domain, students living in the hostel had the maximum score. For the domain of the social relation, students living alone had the maximum score. For the environment health domain, students living with their family had the maximum score.

Table 6 Scores of medical students, according to their accommodation

WHOQOL-BREF Domains	With Family	Hostel	Alone	F-value	p-value
Physical health	55.02 ± 14.54	53.47 ± 14.09	49.94 ± 12.71	2.148	0.117
Psychological health	57.82 ± 16.33	59.59 ± 15.51	56.41 ± 15.94	1.529	0.217
Social relations	58.02 ± 20.0	57.28 ± 21.90	59.18 ± 19.03	0.188	0.829
Environment	47.97 ± 13.74	47.72 ± 13.78	46.88 ± 15.32	0.079	0.924

Table 7 shows the scores of quality of life according to WHO-QOL-BREF standard in different domains for students according to their age groups. These scores were found to be different in each domain according to different age groups but not found to be significant. For the physical health domain, students of age group 33-37 years had the maximum score. For the psychological health domain, students of age group 38-42 years had the maximum score. For the domain of the social relation, students of age group 28-32 years had the maximum score. For the environment health domain, students of age group 33-37 years had the maximum score, while the students living alone had the minimum score.

Table 7 Scores of medical students in different age groups

WHOQOL-BREF domains	17-22 years	23-27 years	28-32 years	33-37 years	38-42 years	F-value	p-value
Physical health	54.23 ± 14.80	54.30 ± 12.78	57.92 ± 10.69	73.0 ± 9.16	50.0 ± 26.87	1.512	0.196
Psychological health	58.34 ± 15.99	59.01 ± 16.32	56.83 ± 14.24	56.33 ± 16.44	59.50 ± 21.92	0.120	0.976
Social relations	57.92 ± 20.81	56.60 ± 20.31	66.67 ± 24.13	64.67 ± 7.51	62.50 ± 17.68	0.847	0.496
Environment	48.10 ± 13.71	46.71 ± 13.72	47.92 ± 18.07	60.67 ± 9.71	59.50 ± 13.44	1.446	0.217

The overall Cronbach's a coefficient of the WHO-QOL-BREF questionnaire was 0.837. The scores according to different academic years were significantly different in the environmental health domain ($p<0.05$); in which second-year students had the least score and fifth-year students had the highest score.

Reliability

The degree of internal uniformity among the items was expressed by Cronbach's a coefficient. The overall Cronbach's a coefficient of the WHOQOL-BREF questionnaire was 0.837, while the Cronbach's coefficient for the physical health, psychological health, social relations, and environment domains were 0.581, 0.655, 0.551 and 0.705 respectively.

DISCUSSION

This observational study among medical students based on WHO-QOL-BREF protocol shows that the year of study, accommodation and different age groups are important indicators for the assessment of QOL in medical students. The scores for QOL among medical students based on their different years of study, accommodation and different age groups are found to be different in the physical health, psychological health, social relations, and environment domains. However only scores of environment health domain based on different years of study were found to be statistically significant ($p<0.05$), but no other domain was found to be statistically significant based on other indicators like accommodation and different age groups of these medical students. Students from clinical years had higher scores in the social relations and environment domains as compared to preclinical years. This could be implicated that students of clinical years had more experience and maturity to improve their social relations and the environment in comparison to students of preclinical years. Some studies with medical students have found that during the first year of medical school students had a deficit in hours of sleep, physical activity, and social interactions which show agreement with our finding [24,25].

We found that the students living with their family had higher scores of physical health than the students living in hostel or living alone, which might be due to the reasons that, living with their family students get more care and household facilities to maintain their physical health. A study by Arsia Jamali, among medical students of Tehran University, supports this finding; they found that the students living with family had more scores of physical health as compared to the students living in dormitory [26]. We found that the students staying with family had better psychological health and better perception of environmental conditions. Hence, staying with family is an important determinant affecting multiple domains related to the quality of life. The family provides a protective environment to the individuals which ensure mental security. Also, psychological support is also provided by the members of the family in the event of stressful situations. Probably that is why the level of stress was less among individuals residing with family. These factors may play a role in improving the academic performance of the students.

In this study, we found that students having age above 33 years had more scores of physical health than the students below 33 years of age which might be due to more life experience among students above 33 years of age for maintenance of their physical health. We found that the students above the age of 28 years had higher scores in the social relations as compared to the students below 28 years of age; students above age of 33 years had higher scores in environment domain as compared to the students below 33 years of age which could be again implicated that students of more age had more experience and maturity to improve their social relations and environment in comparison to students of less age, as we found that clinical years had higher scores in the social relations and environment domains as compared to preclinical years. A similar kind of the previous study based on WHO-QOL-BREF protocol among Chinese medical students found that the scores of different academic years were significantly different in the psychological health and social relations domains; third-year students had the lowest scores in psychological health and social relations domains; students from clinical medicine had the highest scores; gender, interest in the area of study, confidence in career development, hometown location, and physical exercise were significantly associated with the quality of life of students in some domains [27].

Importance of considering a student's health and wellbeing as part of strategies to improve the quality of medical education and health care are recognized by medical schools and educational councils [28]. Some similar kind of previous studies suggests that some impairment of student's emotional stability occurs in this phase of medical training when students make their first contact with patients and may undergo intense emotional experiences involving feelings such as anxiety, insecurity, and guilt [29,30]. There has been widely criticized for this type of traditional curriculum and many medical schools are incorporating curricular reforms which incline towards modern approaches

such as PBL in an attempt to achieve excellence in medical education [31,32]. The mental health problems reported by medical students in this study may be determined by academic factors like curricular overload, poor academic performance, emotional experiences related to initial contact with patients and sleep deprivation [33-37].

Students should be provided with more support, which includes enhancing student capabilities in communication and professionalism and providing students with the necessary instructions to relieve stress and strain during their medical education [38]. Previous studies show that students with a lower level of interest in their specialty were often plagued by burnout and desperation [39], interest in the area of the curriculum is associated with the attitude towards studying. If the students have an active study attitude, they would be having greater enthusiasm towards their curriculum which would yield better academic performance and benefit the QOL of students in both their physical and mental health aspects [27].

CONCLUSION

This study reports the differences in scores of different domains for the quality of life viz., physical health, psychological health, social relations, and environmental health related to different factors like academic years, place of accommodation and age group among medical students. We found significant differences in the environmental domain for the quality of life according to different academic years. Betterment in the quality of life of students is very needful to ensure the good medical education system. It is suggested that all necessary facilities should be provided to the medical students and programmes like career counseling and stress management training should be executed for the students to reduce their mental stress and improve quality of life during medical education.

DECLARATIONS

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Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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