

Relationship between shortage of basic life needs and quality of life of medical students in Yemen: A study utilizing validity and reliability of WHOQOL-BREF questionnaire

Adam S. Obad¹, Fareeha K. Abdulwali¹, Hussein A. H. Alaidroos¹,
Abdulrahman A. BaAbbad¹, Mohammed A. Al-Gunaid¹,
Mohammed O. S. Al Ghurabi¹, Ahmed A. Bawazir¹, Zain A. A. BaFadhl¹,
Zahran A. A. Baqashmer¹, Mohammad Abrar Shareef²

¹College of Medicine, Alfaisal University, Riyadh, Saudi Arabia, ²Department of Family Medicine, Seabasticook Valley Hospital, Pittsfield, Maine, United States

ABSTRACT

Purpose: This study examines quality of life of medical students in Yemen by evaluating validity and reliability of the World Health Organization Quality of Life questionnaire (WHOQOL) and assessing potential influencing factors. **Methods:** This is a single-centered cross-sectional study conducted in Hadramout University College of Medicine, Mukalla, Yemen during the academic year of 2019. The WHOQOL questionnaire was distributed among medical students. For validity, item discriminant validity and confirmatory factor analysis were assessed and for reliability, Cronbach's α test was examined. Independent sample t-test and one-way Analysis of Variance (ANOVA) were used to examine the academic level, gender, academic performance, and basic life necessities including water, electricity supply, sewage treatment and type of residence. **Results:** A total of 495 medical students have responded to this questionnaire which has demonstrated an adequate validity and good reliability. The mean score for students' self-rating of their quality of life in the major domains was found to be in a descending order (Mean \pm SD): psychological health (55.18 \pm 17.84), environmental (52.14 \pm 17.60), physical health (48.15 \pm 14.73) and social relations (45.09 \pm 20.81). Demographics and basic life needs exhibit relationship with Quality of Life among medical students. **Conclusion:** The WHOQOL-BREF is a valid and reliable tool among medical students in Hadramout University. Demographics and basic life needs seem to impact Yemeni medical students' Quality of Life. Wellness and mentoring programs should be considered to ameliorate effects related to deteriorating medical students' Quality of Life in Hadramout University.

Keywords: Basic life necessities, medical students, quality of life, Yemen

Introduction

The World Health Organization (WHO) defines the term 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

Address for correspondence: Dr. Mohammad Abrar Shareef,
447 N Main St, Pittsfield, Maine 04967, United States.
E-mail: mshareef@emhs.org

Received: 20-05-2020

Revised: 31-08-2020

Accepted: 28-10-2020

Published: 08-04-2021

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_935_20

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Obad AS, Abdulwali FK, Alaidroos HA, BaAbbad AA, Al-Gunaid MA, Al Ghurabi MO, *et al.* Relationship between shortage of basic life needs and quality of life of medical students in Yemen: A study utilizing validity and reliability of WHOQOL-BREF questionnaire. *J Family Med Prim Care* 2021;10:1466-72.

they live and in relation to their goals, expectations, standards, and concerns".^[1] The term QoL was first introduced in literature in 1960, however in recent times it has become increasingly common. In 1975, QoL was formally added as a term in medical literature databases.^[2] The QoL concept has evolved over time to include several parameters that impact it such as: psychological state, physical health, social life and environmental conditions.^[3] Because QoL is an important element in every individual's life, several measuring instruments have been developed to assess QoL across different groups of the population. One of the most used comprehensive instruments to measure QoL, is the World Health Organization Quality of Life (WHOQOL) Questionnaire.^[4]

The WHOQOL questionnaire was developed by WHO and 15 other centers worldwide. Initially, the questionnaire consisted of 100 Likert-based questions to examine individual's satisfaction level.^[5,6] Later, the WHO abbreviated the questionnaire to consist of 26 items, namely WHOQOL-BREF, that focuses on four main domains: psychological state, physical health, social life and environmental conditions.^[7] Considering the definition of QoL by WHO, it was essential to validate the questionnaire across array of several cultures, thus the instrument was translated into 40 languages.^[8] Such effort led to widespread use of this important tool and facilitated examining its validity across several cultures and sub-groups of the population in developed and developing countries. The WHOQOL-BREF was employed to assess QoL among general population, patients, and minorities, resulting in better understanding of individuals' QoL and developing potential interventions to improve QoL.^[9]

Medical education is one of the training types that is associated with increased levels of stress for medical students. As a result, medical students are more predisposed to negative effects impacting their psychological and physical health, and social life.^[10,11] Generally, medical students have been found to have lower QoL in developed and developing countries.^[12,13] The low QoL has been explained by increased levels of anxiety, depression, financial challenges, high academic load, and periodic assessments.^[14,15] Taken together, medical students' health is at stake as shown in several studies that they are subjected to develop diminished sense of empathy and compassion and abuse of alcohol and illicit drugs.^[16] Moreover, the role of environment should not be neglected as an essential contributor to the determinants of medical students' health and QoL. Particularly, in developing countries, the environmental factors carry significant burden on medical students' QoL and health.^[17]

Yemen is considered a low socioeconomic status country where it demonstrates shortage of basic life necessities such as: drugs, clean water, and fuel.^[18,19] Taken together, this further complicates the situation for medical students in Yemen and potentially could impact their QoL. The current study was undertaken to explore validity and reliability of the WHOQOL-BREF questionnaire among Yemeni medical students and examine association of shortage of basic life needs with their quality

of life. To the best of our knowledge, this is the first study to examine QoL of medical students in Yemen in general, and it is one of the few studies to assess the validity and reliability of the WHOQOL-BREF in the middle east.

Materials and Methods

Medical education in Hadramout University

Medical education in Hadramout University is a seven-year course. The curriculum generally is divided into two phases, preclinical and clinical. Phase 1, first three years, covers the basic sciences courses such as: Anatomy, Physiology, histology, embryology, pathology, and microbiology. The curriculum pedagogy is delivered in organ system-based blocks. Students are taught basic sciences subjects in the context of an organ system such as: cardiovascular, gastrointestinal etc. Phase 2 is a three year of clerkship in a hospital. During the clerkship years, students are trained to develop clinical competencies through rotating in several departments of the hospital including internal medicine, pediatrics, obstetrics and gynecology, family medicine, radiology, ophthalmology orthopedics etc., Hadramout University adopts active learning strategies such as: Problem-Based Learning (PBL) sessions, small group discussions, and Clinical Presentation Curriculum (CPC). Lastly, students are required to complete a 12-month internship training. Yes, it was. Date is 17-06-2018.

Study design and participants

This is a single-centered cross-sectional study conducted in Hadramout University College of Medicine, Mukalla, Yemen during the academic year of 2018-2019. The study included all medical students in different academic levels from first year to sixth year. The Arabic translation of WHOQOL-BREF questionnaire was adopted from a previous study.^[9] Questionnaire was distributed in a paper-based format and students were asked to complete it in a week time.

Questionnaire details and data collection

The WHOQOL-BREF questionnaire is a self-administered anonymous instrument that was utilized to assess the QoL among medical students of Hadramout University in Yemen. The survey consists of 26 items covering the major four domains which are: physical health (7 items), psychological wellbeing (6 items), social relationship (3 items), and environmental conditions (8 items). In every domain, each item is formatted based on a Likert scale expressed as (1 = very poor or very dissatisfied), (2 = poor or dissatisfied), (3 = neither poor nor good, neither dissatisfied nor satisfied), (4 = good or satisfied), and (5 = very good or very satisfied). Any questionnaire that was not fully completed was excluded from the study. The score of each domain was translated into a linear scale that ranged from (1-100). Moreover, the instrument starts with two broad questions about the respondent's quality of life and to what extent they are satisfied with it. Also, multiple demographic and other identifying items were included in the survey such as: age, gender, marital status, accommodation status, social status, socioeconomic status,

academic performance, and some basic life necessities such as: water, fuel and electricity availability.

Data analysis

The statistical analysis was performed following several steps. First, the demographic features were determined and reported as frequency distribution. The Item Discriminative Validity (IDV) was utilized to extract the Pearson Correlation Coefficient of every item with its corresponding domain. Next, the confirmatory factor analysis was used to examine the validity of the four-factor model of the questionnaire. The reliability of the tested domains was determined using Cronbach's α test. Following that, the descriptive analysis was processed by transforming the domain specific scores into a linear scale ranging from 0-100 score. Independent sample t-test was used to examine the academic level and gender specific differences in students' scoring of each tested domain. The evaluation of basic life necessities including water and electricity supply, sewage treatment and type of residence in addition to their academic performance, was performed using one-way Analysis of Variance (ANOVA). The significance level was determined at *P* value less than 0.05. Data was represented as mean \pm standard deviations. All the statistical analysis was processed using the IBM analysis of a moment structures (AMOS) version 21 and IBM Statistical Package for Social Sciences (SPSS) version 20.

Results

Demographic characteristics of study participants

A total of 495 medical students completed the questionnaire giving a response rate of 84%. Around 57% of respondents were male, and 181 (43%) were female medical students. Table 1 demonstrates the characteristics of study participants with respect to gender, academic level and performance, the latter is depicted as Grade Point Average (GPA). Most of the students had continuous water supply (62%) and only 14% of them rarely had any supply. Furthermore, around 214 students (43%) had continuous electric coverage while 128 students barely had any power supply. Sewage treatment is intermittently provided to 42% in comparison to 31% of students who had adequate supply.

With regards to students' housing type, around 47% of all medical students in the study reported living with family owned house, while 22.4% of medical students reported living in students' dorms. However, 28% of students are divided between either living with a family in a rental house or in an apartment alone [Table 2].

Validity of WHOQOL BREF construct among Hadramaut medical students

The validity of the questionnaire was assessed using item discriminate validity in which each item was tested for correlation with its own and other domains. The study demonstrated adequate validity by which the correlation efficient of each item with its domain was higher if compared to other domains with least correlation coefficient of 0.41. The confirmatory factor analysis yielded an acceptable fit of WHOQOL-BREF domains to four-factor model. All the following parameters have satisfied requirement for adequacy of model fitness. Chi-square/degree of freedom (CMIN/DF) = 2.81, Tucker Lewis Coefficient (TLI) = 0.93, Root Mean Square Error of Approximation (RMSEA) = 0.07, Comparative Fit Index (CFI) = 0.95, Goodness Fitness Index (GFI) = 0.97, Root Mean Square Residual (RMR) = 0.06 and Adjusted Goodness-of-Fit Index (AGFI) = 0.87 All item loading factors were above 0.40 as shown in Figure 1.

The WHOQOL-BREF questionnaire's reliability in the study population

The Cronbach's α coefficient was noted to be 0.76 for physical health, 0.75 for psychological health, 0.77 for environmental domain, and 0.69 for social relations. This reflects an acceptable internal consistency between the items of each domain in the questionnaire.

Students' self-rating of quality of life in the four main domains

The mean score for students' self-rating of their quality of life in the major domains was found to be in a descending order (Mean \pm SD): psychological health (55.18 \pm 17.84), environmental (52.14 + 17.60), physical health (48.15 + 14.73) and social relations (45.09 \pm 20.81).

Table 1: Demographic characteristics of study population

n (%)	Physical Mean \pm SD	P	Psychological Mean \pm SD	P	Social Mean \pm SD	P	Environmental Mean \pm SD	P
Gender								
Male 282 (57%)	51.79 \pm 14.39	<0.001	56.97 \pm 18.96	<0.01	50.64 \pm 21.58	<0.001	50.11 \pm 18.03	<0.01
Female 211 (43%)	43.29 \pm 13.81		52.61 \pm 15.76		37.68 \pm 17.22		54.79 \pm 16.71	
Academic Level								
Preclinical 246 (50%)	51.46 \pm 12.62	<0.001	55.94 \pm 16.18	0.20	50.56 \pm 21.22	<0.001	52.12 \pm 17.03	0.88
Clinical 167 (34%)	42.54 \pm 16.44		53.66 \pm 20.01		36.87 \pm 18.90		52.39 \pm 17.90	
GPA								
<3.0 132 (27%)	45.58 \pm 15.96	0.01	55.21 \pm 16.76	0.72	42.57 \pm 22.23	0.08	53.11 \pm 18.10	0.64
3.0-3.4 71 (14%)	47.66 \pm 15.29		57.98 \pm 20.30		44.78 \pm 22.41		53.87 \pm 19.27	
3.5-4.0 99 (20%)	51.01 \pm 13.61		55.33 \pm 16.35		49.22 \pm 19.80		51.06 \pm 16.69	
4.0-5.0 114 (23%)	50.53 \pm 11.58		55.64 \pm 17.01		46.98 \pm 16.87		51.24 \pm 17.46	

GPA: Grade Point Average

Table 2: Basic life necessities and medical students' self reporting of quality of life domains

n (%)	Physical Mean±SD	P	Psychological Mean±SD	P	Social Mean±SD	P	Environmental Mean+SD	P
Water Supply								
Continuous 310 (62%)	49.00±14.70	0.20	56.94±16.67	<0.01*	46.35±21.22	0.18	56.03±16.63	<0.001*
Intermittent 114 (23%)	47.20±14.16		54.32±18.42		43.65±20.48		47.35±15.67	
Rare 68 (14%)	45.82±15.82		48.72±20.67		41.75±19.43		41.98±19.19	
Electricity Supply								
Continuous 214 (43%)	47.74±13.85	0.83	56.98±18.00	0.04*	44.12±18.98	0.64	58.68±16.77	<0.001*
Intermittent 152 (31%)	48.20±14.89		55.24±15.37		45.54±21.75		50.04±15.64	
Rare 128 (26%)	48.74±16		52.08±19.90		46.20±22.61		43.64±17.01	
Sewage Treatment								
Continuous 153 (31%)	47.11±14.29	0.52	56.16±17.02	0.15	42.83±18.22	0.16	58.60±17.55	<0.001*
Intermittent 209 (42%)	48.15±14.78		55.89±17.20		45.04±21.81		50.89±16.49	
Rare 127 (26%)	49.13±15.29		52.42±19.62		47.60±22.04		46.03±17.19	
Housing								
Family owned house 231 (47%)	46.58±15.53	<0.001*	53.45±17.22	0.19	42.67±20.94	<0.001*	54.67±16.46	<0.001*
Dorms 110 (22%)	53.52±12.65		55.68±17.91		52.55±19.75		45.75±16.63	
Rented apartment with family 69 (14%)	46.42±14.47		55.73±18.77		43.23±21.94		52.88±20.79	
Single apartment 68 (14%)	47.54±14.11		58.57±18.35		44.38±19.46		52.48±20.79	

*P<0.05

Relationship between gender, academic level and academic performance and quality of life

The current study demonstrated that male students tend to score higher in physical health, psychological health, social relations and environment when compared to their female peers ($p < 0.01$). Preclinical students report higher self-ratings in physical health and social relations in comparison to clinical students, with P values of <0.001 . Furthermore, students with a stronger academic performance expressed higher self-scorings in physical health than those with poor performance, with average of $50.53 + 11.58$ vs $45.58 + 15.96$, respectively (p value of 0.01). The detailed mean differences and level of significance in the aforementioned factors are illustrated in Table 1.

Relationship between basic life needs and quality of life domains

Students who have continuous supply of water have self-attained a higher scoring in both psychological health and environmental domain items with P values of <0.01 and 0.001 , respectively. Moreover, students who rarely have electric power supply, have more predilection towards a lower self-scoring in both psychological health and environmental domains compared to their counterparts with continuous electric coverage ($p = 0.04$ and <0.001). Similarly, poor sewage treatment seems to be negatively associated with students' scores in environmental domain when compared to sustained sewage treatment ($p < 0.001$).

A vast majority of students live in their family owned house (47%) and these students have a higher tendency towards a lower self-evaluation in both physical health and social relations if compared to those who live in dorms, with P values of <0.001 . In contrast, students who reside in dorms demonstrated a greater self-scaling in environmental domain than those who live in their family owned home ($p < 0.001$).

Discussion

The WHOQOL-BREF instrument is person-oriented, multilingual tool for subjective evaluation and is created for universal utility in a multidimensional profile. The WHOQOL-BREF resulted from one-decade advancement research, and has been in existence since 1991, however not until recently when this tool was applied on medical students, especially in developing countries.^[7,8] The first primary finding of our study revealed that WHOQOL-BREF preserves acceptable validity and reliability among medical students in Hadramout University in Yemen. Consistent with our investigation, emerging number of reports from developing countries such as: Saudi Arabia, Bangladesh, and Iran demonstrated that WHOQOL-BREF was also found to be similarly valid and reliable.^[2,20,21]

The WHOQOL-BREF encompasses four domains: physical health, psychological status, social relations and environmental conditions. In our study, medical students in Hadramout University reported the highest rating in psychological health with mean scores of (55.18) followed by environmental conditions (52.14), physical health (48.15) and social relations (45.09) in a descending order. A study conducted by Zhang Y *et al.* demonstrated that medical students in china reported the highest rating in physical health (68) followed by psychological status (65), social relations (65) and environmental conditions (55).^[22] Further, a sample of 630 medical students from Saudi Arabia demonstrated that the highest rated domain was the environmental domain with mean scores of (67.81) followed by psychological status (64.37), social relations (55.67), and ultimately the physical health (46.94).^[23] Taken together, this suggests that medical students from Yemen express lower quality of life compared to other populations of medical students. This could be attributed to variation in students' capacity to handle stressors encountered in medical education training in different countries.

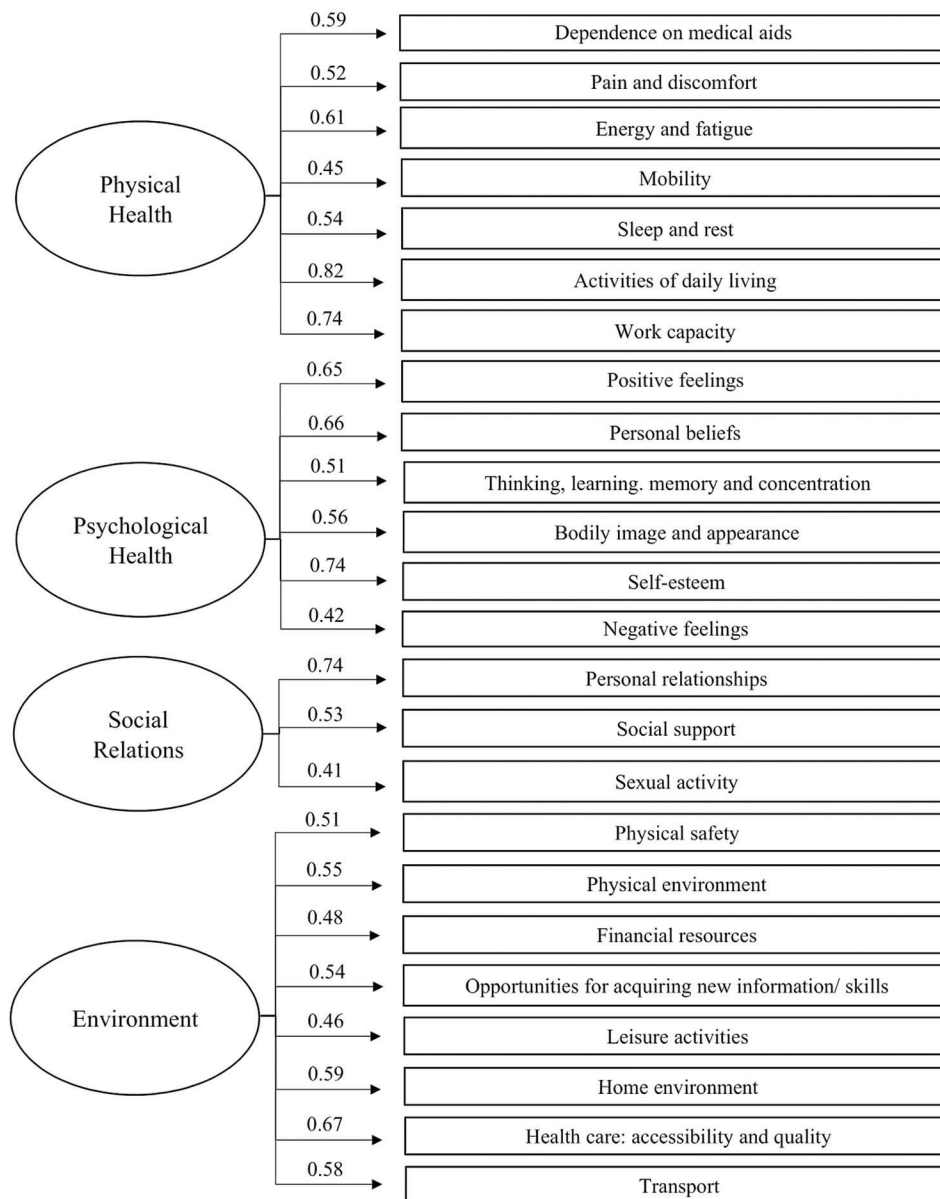


Figure 1: Factor loading of each item in WHOQOL-BREF domains using confirmatory factor analysis

Yemen as a low-income country has invested in improving its medical schools' curriculum by adopting the hybrid Problem-Based Learning (PBL) pedagogy over the course of the past three decades.^[24] QoL has been shown to be lower in medical students due to reasons related to anxiety, depression, financial challenges, lack of learning skills and inability to handle stress.^[14,15] The literature is quite lacking reports examining the prevalence of anxiety and depression among medical students from Yemen. Neighbor country such as Saudi Arabia with stable economic status could further explain the relative higher rating of QoL of Saudi medical students compared to medical students of Yemen.^[22]

Whether factors such as water, electricity supply and sewage treatment had any relationship with QoL among medical students in Yemen was also explored. Students who had continuous supply

of water reported higher scoring in both psychological health and environmental domains. This finding could be reasoned that continuous water supply provides clean home environment, better personal hygiene, and hydration. However, students with shortage in power supply (electricity) reported lower scoring in both psychological health and environmental domains. Absence of electricity restricts many daily life activities for individuals. In the context of medical students, it limits their ability to comfortably study, learn and acquire new skills while at home, and access to the online sources. This could potentially influence the academic performance and hence QoL. It was previously reported that academic performance and QoL are interrelated in the four main domains among preclinical students.^[25] Furthermore, poor sewage treatment seems to be negatively associated with students' scores in environmental domain when compared to sustained sewage treatment. Poor sewage leads to

increasing pollution which is an item of the environment domain in the WHOQOL-BREF. Overall, these findings support the notion that QoL could be impacted by basic public services' sustainability (water, fuel and sanitation). In concordance with previous studies, the current report demonstrates that living with a family owned house seems to favor better QoL. Specifically, students living in a family owned house tend to score higher in the physical domain compared to their classmates living in the dormitory. Probably, living with a family owned house provides more secured environment, emotional support and caring atmosphere.^[14]

Previous cohorts demonstrated conflicting evidences about gender-specific perception of QoL.^[26] In our study, male students' self-evaluation of all domains of QoL was higher compared to female students. We have previously demonstrated similar results among preclinical students in Saudi Arabia. Male students' self-evaluation of psychological and physical domains was higher than females.^[2] Similarly, Chinese male medical students scored significantly higher than females in the psychological domain.

Our study also revealed that QoL and academic performance are correlated in the physical domain. Previous study from Alfaisal University reported that all domains of QoL are interrelated with academic performance in preclinical medical students.^[2] This can be attributed to the items in physical domains such as: energy, activity and sleeping pattern in which, general health promotes a better environment for achieving better in classes and assessments.

In conclusion, the revised version of WHOQOL-BREF questionnaire demonstrates acceptable validity and reliability among medical students in Hadramout University in Yemen. In general, these students self-reported a lower QoL score compared to other countries using the WHOQOL-BREF tool. Considering the extreme shortage of basic life needs in this country, medical students represent an important segment of the population that requires effective interventions. Establishing wellness programs and developing a mentoring program for medical students on how to cope with such situation may be an effective strategy to improve these medical students' outcomes. Focus should be dedicated to students who possess more risk factors. Moreover, there should be more allocated resources invested in enriching the extracurricular activities that may partially help ameliorating the negative effects of the intrinsic and extrinsic environments.^[27] Future studies are needed to examine quality of life of medical students in other countries with shortage of basic life necessities.

Acknowledgments

We appreciate Dr. Ali Mohammad Batarfi, Muhammed Saleh Al-Qu'aiti, Ashraf Fahed Ba-Saleh, and Abdullah Salim Bahadi for their support.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Meeberg GA. Quality of life: A concept analysis. *J Adv Nurs* 1993;18:32-8.
2. Shareef MA, AlAmodi AA, Al-Khateeb AA, Abudan Z, Alkhani MA, Zebian SI, *et al.* The interplay between academic performance and quality of life among preclinical students. *BMC Med Educ* 2015;15:193.
3. Vahedi S. World Health Organization quality-of-life scale (WHOQOL-BREF): Analyses of their item response theory properties based on the graded responses model. *Iran J Psychiatry* 2010;5:140-53.
4. Saxena S, Carlson D, Billington R, Orley J. The WHO quality of life assessment instrument (WHOQOL-Bref): The importance of its items for cross-cultural research. *Qual Life Res* 2001;10:711-21.
5. Moons P, Budts W, De Geest S. Critique on the conceptualisation of quality of life: A review and evaluation of different conceptual approaches. *Int J Nur Stud* 2006;43:891-901.
6. Skevington SM, Lotfy M, O'Connell KA. The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and results of the international field trial. A report from the WHOQOL Group. *Qual Life Res* 2004;13:299-310.
7. The WHOQOL Group. The World Health Organization quality of life assessment (WHOQOL): Development and general psychometric properties. *Soc Sci Med* 1998;46:1569-85.
8. The WHOQOL Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychol Med* 1998;28:551-8.
9. Ohaeri JU, Awadalla AW. The reliability and validity of the short version of the WHO quality of life instrument in an Arab general population. *Ann Saudi Med* 2009;29:98-104.
10. Goldin SB, Wahi MM, Farooq OS, Borgman HA, Carpenter HL, Wiegand LR, *et al.* Student quality-of-life declines during third year surgical clerkship. *J Surg Res* 2007;143:151-7.
11. Henning MA, Krägeloh CU, Hawken SJ, Zhao Y, Doherty I. The quality of life of medical students studying in New Zealand: A comparison with nonmedical students and a general population reference group. *Teach Learn Med* 2012;24:334-40.
12. Singh R. Pilot study to assess the quality of life, sleepiness and mood disorders among first year undergraduate students of medical, engineering and arts. *J Clin Diagn Res* 2016;10:JC01-5.
13. Compton MT, Carrera J, Frank E. Stress and depressive symptoms/dysphoria among US medical students. *J Nervous Mental Dis* 2008;196:891-7.
14. Aktekin M, Karaman T, Senol YY, Erdem S, Erengin H, Akaydin M. Anxiety, depression and stressful life events among medical students: A prospective study in Antalya, Turkey. *Med Educ* 2008;35:12-7.
15. Dyrbye LN, Thomas MR, Huschka MM, Lawson KL, Novotny PJ, Sloan JA, *et al.* A multicenter study of burnout, depression, and quality of life in minority and nonminority US medical students. *Mayo Clinic Proc* 2006;81:1435-42.
16. Hojat M, Mangione S, Nasca TJ, Rattner S, Erdmann JB,

- Gonnella JS, *et al.* An empirical study of decline in empathy in medical school. *Med Educ* 2004;38:934-41.
17. Hassed C, de Lisle S, Sullivan G, Pier C. Enhancing the health of medical students: Outcomes of an integrated mindfulness and lifestyle program. *Adv Health Sci Educ* 2008;14:387-98.
 18. El Bcheraoui C, Jumaan AO, Collison ML, Daoud F, Mokdad AH. Health in Yemen: losing ground in war time. *Global Health* 2018;14:42.
 19. Alamodi AA, Eshaq AM, Fothan AM, Bakather AM, Obad AS. Tackling preventable diseases in Yemen. *Lancet* 2015;386:2251-2.
 20. Tsutsumi A, Izutsu T, Kato S, Islam MA, Yamada HS, Kato H, *et al.* Reliability and validity of the Bangla version of WHOQOL-BREF in an adult population in Dhaka, Bangladesh. *Psychiatry Clin Neurosci* 2006;60:493-8.
 21. Heidari M, Majdzadeh R, Pasalar P, Nedjat S. Quality of life of medical students in Tehran University of Medical Sciences. *Acta Med Iran* 2014;52:390-9.
 22. Zhang Y, Qu B, Lun S, Wang D, Guo Y, Liu J. Quality of life of medical students in China: A study using the WHOQOL-BREF. *PLoS One* 2012;7:e49714.
 23. Malibary H, Zagzoog MM, Banjari MA, Bamashmous RO, Omer AR. Quality of life (QoL) among medical students in Saudi Arabia: A study using the WHOQOL-BREF instrument. *BMC Med Educ* 2019;19:344.
 24. Abdulrahman KB. The current status of medical education in the Gulf Cooperation Council countries. *Ann Saudi Med* 2008;28:83-8.
 25. Matanov A, Giacco D, Bogic M, Ajdukovic D, Franciskovic T, Galeazzi GM, *et al.* Subjective quality of life in war-affected populations. *BMC Public Health* 2013;13:624.
 26. Lodhi FS, Montazeri A, Nedjat S, Mahmoodi M, Farooq U, Yaseri M, *et al.* Assessing the quality of life among Pakistani general population and their associated factors by using the World Health Organization's quality of life instrument (WHOQOL-BREF): A population based cross-sectional study. *Health Qual Life Outcomes* 2019;17:9.
 27. Lumley S, Ward P, Roberts L, Mann JP. Self-reported extracurricular activity, academic success, and quality of life in UK medical students. *Int J Med Educ* 2015;6:111-7.