

Quality of Life Among Postgraduate Medical Residents in Oman: A Cross-sectional Survey

Noor Al Wahaibi^{1*}, Rahma Al Kindi² and Mustafa Al Hinai²

¹Family Medicine Residency Training Program, Oman Medical Specialty Board, Muscat, Oman

²Department of Family Medicine and Public Health, Sultan Qaboos University Hospital, Muscat, Oman

ARTICLE INFO

Article history:

Received: 26 February 2023

Accepted: 23 May 2023

Online:

DOI 10.5001/omj.2023.115

Keywords:

Quality of Life; Graduate Medical Education; Internship and Residency; Health Status; Oman.

ABSTRACT

Objectives: To assess the quality of life (QoL) of medical residents enrolled in the various postgraduate programs of the Oman Medical Specialty Board (OMSB).

Methods: The data for this cross-sectional study was collected from January to June 2022. All postgraduate residents who were enrolled in all 19 OMSB training programs were targeted. An online English version of the validated 36-Item Short Form Health Survey (SF-36) was used to assess the participants' self-reported QoL. **Results:** The participants were 425 OMSB residents (mean age = 29.6±2.2 years), of whom 289 (68.0%) were female, 259 (60.9%) were married, and 295 (69.4%) were enrolled in medical specialties. Overall, female residents reported significantly poorer QoL than male residents in all subscales of SF-36 ($p = 0.001$). Married residents reported lower bodily pain scores than unmarried residents ($p = 0.005$), although the latter endorsed better physical functioning, general health, and mental health. Residents in laboratory specialties had higher scores than those in medical and surgical specialties in most QoL dimensions including physical health, role functioning, energy/fatigue, emotional well-being, bodily pain, and general health ($p \leq 0.003$). Psychiatry residents reported the lowest overall QoL.

Conclusions: Postgraduate medical residents in Oman reported significant variations in QoL based on specialization, gender, and marital status. These findings underscore the need for targeted interventions to tackle health inequalities and improve the QoL of this population.

Quality of life (QoL) is a subjective, multidimensional construct used to measure an individual's overall well-being by assessing their self-perceptions of the state of their life in various domains.¹ While the perceptions of health and QoL in patient populations have been extensively investigated, there is a need for more research focusing on the healthcare personnel, whose QoL impacts not only themselves but also the quality and safety of the healthcare they provide.²⁻⁴

Research has shown that postgraduate medical residents are subject to higher levels of stress than similarly aged people in non-medical programs.^{2,3} Various studies have linked medical education and residency training with deficits in sleep, physical activity, and social interactions, as well as with work stress, burnout, and depression.⁴⁻⁶ Thus, an understanding of the factors that influence residents' QoL during medical training can help facilitate healthcare promotion activities and psychopedagogical services during their training period.

Research among healthcare professionals has linked their poor QoL with a long-term negative effect on their health.⁵⁻⁷ However, most such studies originating from Oman have been performed in single, localized centers and therefore may not have reflected the realities fully. Therefore, this larger study aimed to assess the QoL of all postgraduate medical residents in Oman and determine the relationships between the QoL parameters and their sociodemographic characteristics.

METHODS

This cross-sectional study was carried out from January to June 2022 among postgraduate residents enrolled in various training programs of the Oman Medical Specialty Board (OMSB), the sole regulatory body of postgraduate medical training in Oman. The OMSB is an autonomous organization responsible for developing and maintaining postgraduate medical education standards, criteria, and certification for practicing healthcare professionals in defined areas

of medical specialization, including anesthesia, biochemistry, dentistry, dermatology, ear nose and throat, emergency medicine, family medicine, general surgery, hematology, histopathology, internal medicine, microbiology, obstetrics and gynecology, ophthalmology, oral and maxillofacial surgery, orthopedics, psychiatry, child health, and radiology. The total population of postgraduate residents during the study period was approximately 602, distributed in 19 training programs. We excluded 19 residents who were on long leave, had recently completed their residency training, or were undertaking master's degrees abroad or fellowships. Thus, 583 residents were included in the study.

An electronic, self-administered questionnaire was distributed to all residents using Google Forms (Google LLC, Mountain View, CA, USA). Self-reported health status and QoL were assessed using an English version of the validated 36-Item Short Form Health Survey (SF-36), which is available free online.⁸ Although this instrument is usually applied to specific clinical groups or disease populations, the tool itself was designed for use as a generic health measure in the general population (among individuals aged ≥ 14 years).⁹⁻¹¹ The SF-36 consists of eight subscales to assess various aspects of health-related QoL, including physical functioning, physical role functioning, bodily pain, general health, vitality (energy/fatigue), social functioning, emotional role functioning, and mental health. The score for each subscale is determined on a 0–100 scale where each question carries equal weight, with weighted sums calculated for the questions in each section. Lower scores are taken to indicate a greater degree of disability. However, as per the questionnaire developers, the SF-36 cannot be used to generate a global measure of health-related QoL.¹² As such, we made initial crude estimates using a procedure previously described.¹³

We used SPSS Statistics (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.), for data analysis. Descriptive findings were reported as means and SD for normally distributed continuous variables and as frequencies and percentages for categorical variables. The associations between the participants' sociodemographic characteristics (categorical variables) were tested using either an independent *t*-test or an analysis of variance. Pearson's chi-squared test was applied to compare categorical

variables. Statistical significance was considered to be at $p \leq 0.05$.

This study was conducted as per the Declaration of Helsinki, the ethical approval for which was given by the OMSB Research Ethics Committee (ref: 2020/10/7/1582 dated 28/10/2020). Prior informed consent was obtained from all the invitees after appraising them about the objectives of the study, the voluntary and confidential nature of their participation, and their right to withdraw at any time.

RESULTS

A total of 583 residents initially agreed to participate in the study (437 women and 146 men), of whom 425 returned completed questionnaires (response rate = 72.9%). Of the 425 participants, 289 (68.0%) were female and 136 (32.0%) were male. Their mean age was 29.6 ± 2.2 (range = 25–35) years. Senior residents were in the slight majority (217; 51.1%). Most participants were married (259; 60.9%) and had one or more children (224; 52.7%). Most (295; 69.4%) residents were enrolled in medical specialties (anesthesia, dermatology, emergency medicine, family medicine, internal medicine, psychiatry, pediatric medicine, and radiology), 95 (22.4%) were in surgical specialties (ear nose and throat, general surgery, ophthalmology, oral and maxillofacial surgery, obstetrics and gynecology, and orthopedics), and 35 (8.2%) were in laboratory specialties (biochemistry, hematology, histopathology, and microbiology). Most participants originated from outside Muscat (257; 60.5%) [Table 1].

A reliability analysis was conducted to investigate the internal consistency and reliability of each SF-36 subscale. Apart from one, all the SF-36 subscales had Cronbach's alpha values > 0.7 , indicating satisfactory reliability [Table 2]. According to the univariate analysis, male residents reported a significantly higher QoL scores than female residents in all SF-36 subscales ($p = 0.001$). Married residents had statistically significantly lower body pain scores compared to unmarried residents (61.6 ± 19.8 vs. 67.4 ± 20.0 ; $p = 0.005$); however, single residents had significantly higher scores than their married counterparts for other QoL domains, including physical functioning (85.1 ± 18.0 vs. 79.6 ± 21.6 ; $p = 0.008$), general health (61.0 ± 12.0 vs. 57.8 ± 13.1 ; $p = 0.014$), mental health (50.4 ± 16.9 vs. 46.7 ± 18.3 ;

Table 1: Sociodemographic characteristics of postgraduate medical residents enrolled at the Oman Medical Specialty Board (N = 425).

Characteristics	n (%)
Age, years	
Mean \pm SD	29.6 \pm 2.2
Range	25–35
Gender	
Male	136 (32.0)
Female	289 (68.0)
Year of residency	
R1	92 (21.6)
R2	115 (27.1)
R3	99 (23.3)
R4	96 (22.6)
R5	20 (4.7)
R6	3 (0.7)
Residency level	
Junior	208 (48.9)
Senior	217 (51.1)
Specialty	
Medical	295 (69.4)
Surgical	95 (22.4)
Laboratory	35 (8.2)
Marital status	
Single	166 (39.1)
Married	259 (60.9)
Number of children	
0	201 (47.3)
1	138 (32.5)
> 1	86 (20.2)
Region of residence	
Muscat	168 (39.5)
Other	257 (60.5)

Table 2: Reliability and mean scores for each quality of life subscale* among postgraduate medical residents enrolled at the Oman Medical Specialty Board (N = 425).

Subscale	Cronbach's alpha	Mean \pm SD
Physical functioning	0.913	81.7 \pm 20.4
Role functioning/physical	0.808	50.4 \pm 39.4
Role functioning/emotional	0.797	52.6 \pm 41.7
Energy/fatigue	0.797	61.7 \pm 18.4
Social functioning	0.810	58.4 \pm 20.8
Bodily pain	0.774	63.8 \pm 20.1
General health	0.520	58.8 \pm 12.8
Mental health	-	48.0 \pm 17.9

*Self-reported by the participants using an English version of the validated 36-Item Short Form Health Survey.⁸

$p = 0.038$), and emotional role functioning (61.3 ± 41.7 vs. 47.8 ± 40.9 ; $p = 0.001$). Finally, residents enrolled in laboratory specialties had significantly higher scores across all SF-36 subscales than those in medical and surgical specialties ($p \leq 0.003$) [Table 3].

DISCUSSION

The current study assessed the QoL of postgraduate medical residents in Oman. Gender, specialty, and marital status were the main factors found to influence the cohort's QoL. Significant gender differences in all QoL subscales were revealed, with male participants scoring significantly higher than females in all dimensions. These findings are consistent with those from Italy and the USA.^{14,15} The gender-related differences in QoL in our study were larger than those observed in Greece.¹⁶ A previous study in the USA based on a national sample of 2,326 physicians found that female physicians were 1.6 times more likely to endorse burnout than male physicians, with the odds of burnout increasing by 12–15% for each additional five hours worked per week beyond 40 hours.¹⁷

This greater burden has been linked to the nonprofessional responsibilities of women, such as childcare.^{18,19} Indeed, outside of the healthcare field, Jenkinson et al,²⁰ reported that women of working age had poorer SF-36 scores than men in all general health dimensions. Other studies have also suggested that irrespective of profession or age group, women generally reported poorer QoL than men.^{11,21} This has been postulated to be related to the influence of gender on decision-making and gender differences in the subjective perceptions of health, potentially indicating the need to develop gender-specific QoL benchmarks.²² Others have suggested that lower QoL among women may also vary due to cultural and societal expectations resulting in lower social status, lower income potential, and more barriers to healthcare access compared to men.^{22–24} Given the fact that the majority of healthcare practitioners globally are women (as also reflected in our cohort) the lower QoL among them is concerning and calls for further research.²⁵

One significant finding of this study was that the better QoL endorsed by the residents of laboratory specialties in all SF-36 subscales compared to surgical and medical residents, implying the existence of QoL inequalities between various healthcare specialties.

Table 3: Associations between quality of life* and sociodemographic characteristics among postgraduate medical residents enrolled at the Oman Medical Specialty Board (N = 425).

Characteristics	Quality of life subscale: mean score ± SD							
	Physical functioning	Role functioning		Energy/fatigue	Social functioning	Bodily pain	General health	Mental health
		Physical	Emotional					
Gender								
Male	86.4 ± 19.2	60.8 ± 39.2	69.1 ± 38.6	67.9 ± 17.5	65.0 ± 19.6	69.0 ± 19.2	60.8 ± 12.9	50.7 ± 18.2
Female	79.5 ± 20.5	45.4 ± 38.5	44.8 ± 40.8	58.8 ± 18.0	55.2 ± 20.6	61.3 ± 19.9	57.9 ± 12.0	46.7 ± 17.6
<i>p</i> -value	0.001 [†]	0.001 [†]	0.001 [†]	0.001 [†]	0.001 [†]	0.001 [†]	0.001 [†]	0.001 [†]
Residency level								
Junior	81.9 ± 19.5	52.1 ± 39.8	52.8 ± 41.9	60.7 ± 19.0	57.9 ± 21.0	63.5 ± 20.2	58.4 ± 12.4	47.8 ± 17.6
Senior	81.5 ± 21.2	48.8 ± 38.9	52.6 ± 41.5	62.8 ± 17.0	58.9 ± 19.0	63.8 ± 19.7	59.2 ± 13.0	48.1 ± 18.2
<i>p</i> -value	0.850	0.385	0.974	0.246	0.615	0.893	0.523	0.866
Specialty								
Medical	80.6 ± 21.0	47.7 ± 38.9	49.9 ± 41.8	60.4 ± 18.5	57.0 ± 21.0	62.3 ± 20.1	58.7 ± 13.1	48.0 ± 18.4
Surgical	80.5 ± 19.0	49.2 ± 40.5	49.4 ± 41.7	60.5 ± 18.1	57.3 ± 19.0	63.2 ± 20.0	56.9 ± 11.4	44.1 ± 16.1
Laboratory	93.7 ± 13.1	76.4 ± 31.9	83.3 ± 24.9	75.2 ± 10.0	72.7 ± 12.0	77.4 ± 14.3	65.4 ± 10.2	58.0 ± 13.3
<i>p</i> -value	0.001 [†]	0.001 [†]	0.001 [†]	0.001 [†]	0.001 [†]	0.001 [†]	0.003 [†]	0.001 [†]
Marital status								
Single	85.1 ± 18.0	61.6 ± 38.5	61.3 ± 41.7	64.0 ± 20.4	61.1 ± 21.6	67.4 ± 20.0	61.0 ± 12.0	50.4 ± 16.9
Married	79.6 ± 21.6	44.4 ± 38.4	47.8 ± 40.9	60.3 ± 17.1	56.8 ± 20.3	61.6 ± 19.8	57.8 ± 13.1	46.7 ± 18.3
<i>p</i> -value	0.008 [†]	0.001 [†]	0.001 [†]	0.063	0.042 [†]	0.005 [†]	0.014 [†]	0.038 [†]

*Self-reported by the participants using an English version of the validated 36-Item Short Form Health Survey.⁸

[†]Statistically significant.

According to a systematic review and meta-analysis of studies on surgical residents, number of hours worked per week may represent a significant predictor of burnout, decreased career satisfaction, and poorer QoL.²⁶ Additional research is necessary to determine whether the number of hours worked plays a role in the QoL of postgraduate medical residents in Oman and whether and how this relates to their chosen specialty. Previous research has demonstrated variations in QoL in terms of physical functioning, physical role functioning, and bodily pain, between healthcare workers in different roles, while others have reported no differences in general health, social functioning, emotional role functioning, or mental health.^{4,27}

We also noted that Omani residents' QoL differed depending on their marital status, with single residents appearing to outperform their married counterparts in almost all QoL domains, perhaps attributable to the additional domestic commitments of married individuals.

Another finding of concern in the current study was the fact that mental health residents had the lowest scores (mean = 48.0 ± 17.9) in all QoL domains. A study conducted in the USA found that psychiatry residents had QoL scores similar to those of mental

health professionals.²⁸ In Italy and Japan, psychiatry residents have demonstrated moderate burnout.^{29,30} However, it is important to note that concepts of QoL and burnout in these studies were assessed using different tools (including the Multi-Cultural Quality of Life Inventory, Patient Health Questionnaire-9, and Maslach Burnout Inventory-General Survey) which may hinder meaningful comparison.²⁸⁻³⁰

In the United Arab Emirates, a multicenter study indicated that at least one symptom of burnout was evident in up to 70% of medical residents, with the prevalence of depression ranging 6–22%, depending on the specialty.³¹ In Greece, healthcare personnel exhibited greater mental health impairment and significantly lower SF-36 scores compared to non-medical workers such as teachers and municipality workers.³² A Danish study showed that those in human service occupations were at increased risk of common mental disorders, mostly depression and anxiety.³³ We therefore recommend additional screening to detect mental health disorders and other associated health conditions among postgraduate medical residents in Oman. We also recommend additional follow-up research on their post-training QoL, in addition to interview-

guided qualitative research to provide more in-depth data.

As per the Accreditation Council for Graduate Medical Education (ACGME), “the goal of any postgraduate medical training program should not merely be to prepare its trainees with medical knowledge and skills to function as independent physicians, but also equip them with the necessary tools to maintain habits of lifelong learning and personal well-being”.^{34,35} Specifically, the ACGME updated their common program requirements to reflect the importance of physician self-care and wellbeing, both with regards to the role that such aspects play in meeting the core competency of professionalism, as well as in reducing burnout and depression.³⁵

A variety of interventions have been proposed to help improve the mental health and QoL of postgraduate residents and prevent burnout in this population, including residency-integrated support services as well as implementing voluntary wellness and resilience programs designed to promote regular exercise, healthy diet, healthy coping/stress management mechanisms, and sleep hygiene.^{34,36,37} Future research in Oman could focus on designing and testing the effectiveness of such programs among OMSB residents to determine their feasibility in this setting and their impact on QoL.

To our knowledge, this study measured QoL in the largest ever sample of Omani postgraduate medical residents, and it yielded a large number of statistically significant findings. A limitation of this research was that the cross-sectional design did not allow for the determination of causality. Moreover, there is uncertainty as to the appropriateness of applying certain dimensions of HRQOL (such as bodily pain) among non-patients. Future longitudinal studies may produce broad-ranging results with greater validity and scope which can form the basis of strong policies to improve the overall QoL of medical residents in Oman, gender-wise and specialty-wise.

CONCLUSION

Specialization, gender, and marital status were factors that significantly influenced self-perceptions of QoL among a large cohort of postgraduate medical residents in Oman. Male gender, single status, and being enrolled in laboratory specialties were predictive of higher scores in most QoL

domains. These findings may help develop and implement further supportive measures to improve QoL discrepancies and health inequalities among postgraduate medical residents.

Disclosure

The authors declared no conflicts of interest. No funding was received for this study.

Acknowledgments

We are grateful to Mr. Sachin Jose of the Oman Medical Specialty Board, Muscat, Oman, for his invaluable help with the statistics.

REFERENCES

- Schipper H, Clinch JJ, Olweny CL. Quality of life studies: definitions and conceptual issues. *Quality of Life and Pharmacoeconomics in Clinical Trials* 1996;2:11-23.
- Zubairi AJ, Noordin S. Factors associated with burnout among residents in a developing country. *Ann Med Surg (Lond)* 2016 Feb;6:60-63.
- Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, et al. Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. *Acad Med* 2014 Mar;89(3):443-451.
- Tan EC, Chen DR. Second victim: malpractice disputes and quality of life among primary care physicians. *J Formos Med Assoc* 2019 Feb;118(2):619-627.
- Al Mukhaini AM, Al Houqani FA, Al Kindi RM. Internet addiction and depression among postgraduate residents: a cross-sectional survey. *Sultan Qaboos Univ Med J* 2021 Aug;21(3):408-415.
- Al-Houqani F, Al-Mukhaini A, Al-Kindi R. Prevalence of depression among Oman Medical Specialty Board (OMSB) residents. *Oman Med J* 2020 Apr;35(2):e116.
- Kheiraoui F, Gualano MR, Mannocci A, Boccia A, La Torre G. Quality of life among healthcare workers: a multicentre cross-sectional study in Italy. *Public Health* 2012 Jul;126(7):624-629.
- Brazier JE, Harper R, Jones NM, O’Cathain A, Thomas KJ, Usherwood T, et al. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. *BMJ* 1992 Jul;305(6846):160-164.
- Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992 Jun;30(6):473-483.
- Chang DF, Chun CA, Takeuchi DT, Shen H. SF-36 health survey: tests of data quality, scaling assumptions, and reliability in a community sample of Chinese Americans. *Med Care* 2000 May;38(5):542-548.
- Sullivan M, Karlsson J. The Swedish SF-36 health survey III. Evaluation of criterion-based validity: results from normative population. *J Clin Epidemiol* 1998 Nov;51(11):1105-1113.
- Lins L, Carvalho FM. SF-36 total score as a single measure of health-related quality of life: scoping review. *SAGE Open Med* 2016 Oct;4:2050312116671725.
- Apolone G, Mosconi P. The Italian SF-36 health survey: translation, validation and norming. *J Clin Epidemiol* 1998 Nov;51(11):1025-1036.
- Messina G, Quercioli C, Troiano G, Russo C, Barbini E III, Nisticò F, et al. Italian medical students quality of life: years 2005-2015. *Ann Ig* 2016;28(4):245-251.
- Zubair MH, Hussain LR, Williams KN, Grannan KJ. Work-related quality of life of US general surgery residents: is it really so bad? *J Surg Educ* 2017;74(6):e138-e146.
- Tountas Y, Demakakos PT, Yfantopoulos Y, Aga J, Houliara L, Pavi E. The health related quality of life of the

- employees in the Greek hospitals: assessing how healthy are the health workers. *Health Qual Life Outcomes* 2003 Oct;1:61.
17. McMurray JE, Linzer M, Konrad TR, Douglas J, Shugerman R, Nelson K; The SGIM Career Satisfaction Study Group. The work lives of women physicians results from the physician work life study. *J Gen Intern Med* 2000 Jun;15(6):372-380.
 18. Eek F, Axmon A. Gender inequality at home is associated with poorer health for women. *Scand J Public Health* 2015 Mar;43(2):176-182.
 19. Mussida C, Patimo R, Patimo R. Women's family care responsibilities, employment and health: a tale of two countries. *J Fam Econ Issues* 2021;42(3):489-507.
 20. Jenkinson C, Coulter A, Wright L. Short form 36 (SF36) health survey questionnaire: normative data for adults of working age. *BMJ* 1993 May;306(6890):1437-1440.
 21. Kirchengast S, Haslinger B. Gender differences in health-related quality of life among healthy aged and old-aged Austrians: cross-sectional analysis. *Gend Med* 2008 Sep;5(3):270-278.
 22. Lee KH, Xu H, Wu B. Gender differences in quality of life among community-dwelling older adults in low- and middle-income countries: results from the study on global ageing and adult health (SAGE). *BMC Public Health* 2020 Jan;20(1):114.
 23. Denton M, Prus S, Walters V. Gender differences in health: a Canadian study of the psychosocial, structural and behavioural determinants of health. *Soc Sci Med* 2004 Jun;58(12):2585-2600.
 24. Cherepanov D, Palta M, Fryback DG, Robert SA. Gender differences in health-related quality-of-life are partly explained by sociodemographic and socioeconomic variation between adult men and women in the US: evidence from four US nationally representative data sets. *Qual Life Res* 2010 Oct;19(8):1115-1124.
 25. Boniol M, McIsaac M, Xu L, Wuliji T, Diallo K, Campbell J. Gender equity in the health workforce: analysis of 104 countries. In: *Health workforce working paper 1*. Geneva, Switzerland: World Health Organization. 2019 [cited 2023 April 18]. Available from: <https://apps.who.int/iris/bitstream/handle/10665/311314/WHO-HIS-HWF-Gender-WP1-2019.1-eng.pdf>.
 26. Sosin M, Pulcrano ME, Shara N, Evans SR. Quality of life and burnout rates across surgical specialties: a systematic review and meta-analysis of the current literature. *J Am Coll Surg* 2014 Oct;219(4):e149.
 27. Yang Y, Koh D, Ng V, Lee CY, Chan G, Dong F, et al. Self perceived work related stress and the relation with salivary IgA and lysozyme among emergency department nurses. *Occup Environ Med* 2002 Dec;59(12):836-841.
 28. Kovach JG, Combs CJ, Singh H, Dubin WR. Psychiatry resident quality of life. *Acad Psychiatry* 2016 Feb;40(1):76-80.
 29. Ferrari S, Cuoghi G, Mattei G, Carra E, Volpe U, Jovanovic N, et al. Young and burnt? Italian contribution to the international burnout syndrome study (BOSS) among residents in psychiatry. *Med Lav* 2015 May;106(3):172-185.
 30. Tateno M, Kato TA, Uehara-Aoyama K, Umene-Nakano W, Nakamae T, Uchida N, et al. [The international study of burnout syndrome among psychiatric trainees (BoSS international): findings from statistical analysis of the Japanese data (BoSS Japan)]. *Seishin Shinkeigaku Zasshi* 2017;119(2):83-97.
 31. Abdulrahman M, Nair SC, Farooq MM, Al Kharmiri A, Al Marzooqi F, Carrick FR. Burnout and depression among medical residents in the United Arab Emirates: a multicenter study. *J Family Med Prim Care* 2018;7(2):435-441.
 32. Malfa CS, Karaivazoglou K, Assimakopoulos K, Gourzis P, Vantarakis A. Psychological distress and health-related quality of life in public sector personnel. *Int J Environ Res Public Health* 2021 Feb;18(4):1865.
 33. Wieclaw J, Agerbo E, Mortensen PB, Bonde JP. Risk of affective and stress related disorders among employees in human service professions. *Occup Environ Med* 2006 May;63(5):314-319.
 34. Spiotta AM, Fargen KM, Patel S, Larrew T, Turner RD. Impact of a residency-integrated wellness program on resident mental health, sleepiness, and quality of life. *Neurosurgery* 2019 Feb;84(2):341-346.
 35. Accreditation Council for Graduate Medical Education. Improving physician well-being, restoring meaning in medicine. 2018 [cited 2023 April 17]. Available from: <https://www.acgme.org/what-we-do/initiatives/physician-well-being/>.
 36. Brennan J, McGrady A. Designing and implementing a resiliency program for family medicine residents. *Int J Psychiatry Med* 2015;50(1):104-114.
 37. Levey RE. Sources of stress for residents and recommendations for programs to assist them. *Acad Med* 2001 Feb;76(2):142-150.