



Comparison of Anxiety and Depression Symptoms Between Residents of Anesthesiology and Family Medicine

Hilmi Demirkiran✉ · Mehmet Enver Analan✉ · Mehmet Emin Layık✉

Department of Anesthesiology and Reanimation, Faculty of Medicine, Van Yüzüncü Yıl University, Van, Türkiye

Department of Psychiatry, Keçiören Training and Research Hospital, Ministry of Health, Ankara, Türkiye

Department of Family Medicine, Aydın Adnan Menderes University, Ministry of Health, Aydın, Türkiye

Background: Residency training can be psychologically demanding, but the workload and day-to-day pressures vary across specialties. We compared symptoms of anxiety and depression in anesthesiology and family medicine.

Materials and Methods: In this single-center cross-sectional study, 20 anesthesiology residents and 20 family medicine residents completed a sociodemographic questionnaire and the Hospital Anxiety and Depression Scale (HADS). HADS anxiety and depression subscale scores were compared using the Mann–Whitney U test. Scores of ≥ 10 on HADS-A and ≥ 7 on HADS-D were considered positive screening results. Holm correction was applied to the exploratory item-level analyses.

Results: Anesthesiology residents reported more shifts per month [median 7.0 (interquartile range IQR 6.0–9.0) vs. 4.0 (0.8–5.0); $p=0.000028$] and had spent more time working in the intensive care unit [13.0 (7.0–18.0) vs. 0.0 (0.0–0.0) months; $p=0.000005$]. The groups did not differ significantly in HADS-A [9.0 (7.5–11.3) vs. 7.5 (4.8–10.5); $p=0.237$] or HADS-D [8.5 (4.0–10.5) vs. 4.5 (2.0–8.5); $p=0.061$] scores. Positive anxiety screens occurred in 40% and 30% of participants, respectively ($p=0.741$), and positive depression screens in 60% and 35% ($p=0.205$). No item-level difference remained significant after Holm correction.

Conclusion: Despite a heavier shift and intensive care workload among anesthesiology residents, this small study found no statistically significant difference between the specialties in HADS-A or HADS-D scores. Larger multicenter studies are needed to clarify whether meaningful differences exist.

Keywords: Anxiety; depression; internship and residency; anesthesiology; family practice

Introduction

Residency is a formative stage of a physician's career, but it is also a period of considerable psychological strain. Heavy workloads, growing clinical responsibility and disrupted sleep often occur at the same time. A systematic review estimated the prevalence of depression or depressive symptoms among resident

physicians at 28.8%, although estimates varied substantially according to the instrument and cutoff used (1). Long working hours, limited control over schedules, and professional responsibilities are frequently reported sources of stress (2). In addition to these psychological demands, organizational factors such as workload and working conditions have been

Corresponding Author: Hilmi Demirkiran, MD; Department of Anesthesiology and Reanimation, Faculty of Medicine, Van Yüzüncü Yıl University, Van, Türkiye

E-mail: h.dkiran@hotmail.com

ORCID: 0000-0001-8116-3933

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associated with anxiety and other adverse mental health outcomes among physicians and postgraduate medical trainees (3).

These pressures vary across specialties. Large studies have found specialty-related variation in burnout and career choice regret (4), while surveys of anesthesiology trainees documented substantial levels of burnout, distress, and depression (5). Family medicine residents work in a different environment, where continuity of care and sustained patient interaction may shape their stress experience (6). Recent studies from Türkiye have also reported substantial levels of anxiety and other psychological symptoms among resident physicians (7, 8).

Few studies directly compared anesthesiology and family medicine residents within the same institution. Therefore, the present study aimed to compare anxiety and depression symptoms, assessed using the Hospital Anxiety and Depression Scale (HADS), together with selected sociodemographic and professional characteristics, between residents in these two specialties.

Materials and methods

Subjects

This single-center cross-sectional study was conducted at the University Faculty of Medicine from 15 October to 15 December 2019. At the time of the study, the institution had 22 anesthesiology and reanimation residents and 44 family medicine residents. Residents were eligible if they were actively working, had completed at least 6 months of training, and agreed to participate. Residents from each specialty completed the questionnaire, with participation rates of 90.9% for anesthesiology and 45.5% for family medicine. We aimed to invite the entire eligible population; therefore, we did not perform a separate sample size calculation. The University Non-Interventional Clinical Research Ethics Committee approved the study on 27 September 2019 (decision no. 2019/14-06). The study followed the Declaration

of Helsinki, and all participants provided written informed consent.

Methods

We collected all data using an online questionnaire created in SurveyMonkey. The link was distributed by e-mail and WhatsApp, and participants completed the questionnaire once. The first section covered age, sex, marital status, holiday work, monthly shift count, duration of residency, and time spent working in the intensive care unit.

The second section contained the 14-item HADS, developed by Zigmond and Snaith (9) and validated in Turkish by Aydemir et al. (10). The anxiety and depression subscales each comprise seven items scored from 0 to 3, giving a possible score of 0–21 for each subscale. The continuous HADS-A and HADS-D scores were the co-primary outcomes. Based on the Turkish validation study, scores of ≥ 10 on HADS-A and ≥ 7 on HADS-D were classified as positive screening results. These cutoffs identify participants at increased risk of symptoms but do not establish a psychiatric diagnosis. Item-level comparisons were exploratory. We analyzed the total HADS score as a secondary exploratory outcome and did not consider it a primary endpoint.

Statistical Analysis

We performed statistical analyses using Python 3.12.13, NumPy 2.3.5, and SciPy 1.17. Continuous variables were presented as median and interquartile range, and categorical variables as count and percentage. Continuous variables between the two independent groups were compared using the two-tailed Mann–Whitney U test. The Pearson chi-square test was used for categorical variables when expected cell counts were adequate. We compared HADS-A and HADS-D screening positivity using Fisher's exact test. Holm correction was applied to the 14 exploratory item-level comparisons. For the primary HADS-A and HADS-D comparisons, we also quantified effect sizes using Cliff's delta (δ),

Table 1. Sociodemographic and professional characteristics by specialty

Variable	Family medicine (n=20)	Anesthesiology (n=20)	P value
Age, years	29 (27.8–33)	31.0 (30.0–34.3)	0.075
Male sex, n(%)	8 (40.0)	18 (90.0)	0.001
Married, n(%)	9 (45.0)	12 (60.0)	0.342
Working on holidays, n(%)	6 (30.0)	13 (65.0)	0.027
Monthly shift count	4 (0.8–5.0)	7.0 (6.0–9.0)	0.000028
Residency duration, months	19 (6.8–30.5)	33.0 (17.8–42.8)	0.041
Intensive care unit working time, months	0	13.0 (7.0–18.0)	0.00005

Continuous variables are presented as median (interquartile range) and categorical variables as n (%). Continuous variables were compared with the Mann–Whitney U test and categorical variables with the Pearson chi-square test.

Table 2. Hospital Anxiety and Depression Scale results by specialty

Variable	Family medicine (n=20)	Anesthesiology (n=20)	P value	Cliff's δ (95%CI)
HADS-A score	7.5 (4.8–10.5)	9.0 (7.5–11.3)	0.237	0.220 (–0.140 to 0.565)
HADS-D score	4.5 (2.0–8.5)	8.5 (4.0–10.5)	0.061	0.348 (–0.005 to 0.668)
Total HADS score	10 (7.5–19.3)	16.5 (12.8–22.3)	0.113	—
HADS-A ≥ 10 , n(%)	6 (30.0)	8 (40.0)	0.741	—
HADS-D ≥ 7 , n(%)	7 (35.0)	12 (60.0)	0.205	—

Scores are presented as median (interquartile range) and were compared with the Mann–Whitney U test. Effect sizes for the primary HADS-A and HADS-D comparisons are reported as Cliff's delta (δ) with 95% confidence intervals estimated by nonparametric bootstrap resampling. Screening categories were compared with Fisher's exact test. HADS-A: anxiety subscale; HADS-D: depression subscale.

with the 95% confidence intervals estimated by nonparametric bootstrap resampling. We considered $P < 0.05$ statistically significant.

Results

Of the 66 residents in the study population, 40 met the eligibility criteria and completed the questionnaire, including 20 from each specialty. Age and marital status were similar between the groups. The anesthesiology group included a higher proportion of men (90.0% vs. 40.0%;

$p = 0.001$) and more often reported working on holidays (65.0% vs. 30.0%; $p = 0.027$). These residents had also been in training longer [33.0 (17.8–42.8) vs. 19.0 (6.8–30.5) months; $p = 0.041$], worked more shifts per month [7.0 (6.0–9.0) vs. 4.0 (0.8–5.0); $p = 0.000028$], and had spent more time working in the intensive care unit [13 (7–18) vs. 0 months; $p = 0.000005$].

The HADS-A score was 9.0 (7.5–11.3) in the anesthesiology group and 7.5 (4.8–10.5) in the family medicine group ($p = 0.237$; Cliff's $\delta = 0.220$,

95%CI -0.140 to 0.565). HADS-D scores were 8.5 (4.0–10.5) and 4.5 (2.0–8.5), respectively ($p=0.061$; Cliff's $\delta=0.348$, 95%CI -0.005 to 0.668). Total HADS scores did not differ significantly between groups [16.5 (12.8–22.3) vs. 10.0 (7.5–19.3); $p=0.113$]. Anxiety screening positivity was 8/20 (40.0%) in anesthesiology group and 6/20 (30.0%) in the family medicine group ($p=0.741$). Depression screening positivity was 12/20 (60%) and 7/20 (35%), respectively ($p=0.205$). Two HADS items had unadjusted p values below 0.05. Neither remained significant after Holm correction; the smallest adjusted P value was 0.251. Supplementary Table-1 presents detailed item-level analyses of the HADS anxiety and depression items.

Discussion

The clearest difference between the groups was workload: anesthesiology residents had more shifts and substantially greater exposure to intensive care. We found no difference in HADS-A or HADS-D, or in the proportions screening positive for anxiety or depression. These findings should not be interpreted as evidence that the specialties carry the same psychological risk. Rather, the sample was not large enough to demonstrate a difference.

The anesthesiology group nevertheless had higher median HADS scores, particularly on the depression subscale. This pattern may be clinically relevant, but the small sample leaves considerable uncertainty around the observed difference. Previous surveys of anesthesiology residents have likewise identified depression and distress as important concerns and have linked better psychological well-being with institutional support, work–life balance, and social support (5). Findings from larger resident cohorts also suggest that psychological outcomes vary by specialty and are unlikely to reflect workload alone (4). Recent evidence likewise indicates that workload and working conditions are associated with anxiety, depression, and burnout among physicians and

postgraduate medical trainees (3). These findings support the view that multiple interacting factors, not workload alone, shape the psychological impact of residency.

Family medicine residents face different demands, including continuity of care and patient communication. In one study, their anxiety levels were not higher than those of reference populations, and the authors suggested that support within the training program may have been protective (6). A study conducted across residency programs 18 months into the COVID-19 pandemic also reported burnout, depression, anxiety, and stress among residents (11). More recent studies from Türkiye have similarly demonstrated a substantial burden of anxiety and other psychological symptoms among resident physicians (7,8). Evaluations of resident mental health should therefore consider each specialty's broader working environment, not simply the number of shifts.

Several limitations should be considered. The cross-sectional, single-center design precludes causal conclusions, and the small sample limits precision. Because no a priori power analysis was performed, the study may have been underpowered to detect differences between groups. The lower participation rate among family medicine residents also raises the possibility of selection bias. Sex distribution differed markedly by specialty, but the sample was too small to adjust for this potential confounder in a multivariable model. In addition, HADS is a self-report screening instrument rather than a diagnostic interview (12). The item-level analyses were exploratory, and none remained significant after correction for multiple testing. Another limitation is that the data were collected in 2019, and residents' working conditions, including work schedules, post-pandemic working practices, and educational environments, may have changed over time; therefore, caution is warranted when

generalizing these findings directly to current residents. Finally, the questionnaire did not directly assess suicidal ideation or suicide risk, and the findings should not be interpreted in those terms.

Anesthesiology residents reported more shifts and greater intensive care exposure than family medicine residents. However, this small cross-sectional study did not show a difference in HADS anxiety or depression scores, or in the proportions screening positive. Larger multi-center studies with more balanced participation and adjustment for demographic and professional factors are needed.

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Contact Details

Hilmi Demirkiran, MD

Department of Anesthesiology and Reanimation, Faculty of Medicine
Van Yüzüncü Yıl University, Van, Türkiye
E-mail: h.dkiran@hotmail.com
ORCID: 0000-0001-8116-3933

Mehmet Enver Analan, MD

Department of Psychiatry, Keçiören Training and Research Hospital, Ankara, Türkiye
E-mail: enveranalan01@gmail.com
ORCID: 0009-0006-5213-5785

Mehmet Emin Layik, MD

Department of Family Medicine, Aydın Adnan Menderes University, Aydın, Türkiye
E-mail: eminalayik@gmail.com
ORCID: 0000-0002-4055-3983

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Supplementary Table S1. Exploratory item-level HADS comparisons by specialty

<i>HADS item</i>	Subscale	Family medicine (n=20)	Anesthesiology (n=20)	Unadjusted P	Holm-adjusted P
1. Feeling tense or wound up	HADS-A	1.0 (1.0–1.2)	1.0 (1.0–2.0)	0.555	1.000
2. Enjoyment of things	HADS-D	1.0 (0.0–2.0)	1.0 (1.0–1.0)	0.622	1.000
3. Frightened feeling	HADS-A	1.0 (0.0–2.0)	2.0 (1.0–2.0)	0.335	1.000
4. Ability to laugh and see the funny side	HADS-D	0.0 (0.0–1.0)	1.0 (0.0–1.0)	0.180	1.000
5. Worrying thoughts	HADS-A	1.0 (0.0–1.0)	1.0 (0.0–1.0)	0.793	1.000
6. Feeling cheerful	HADS-D	0.0 (0.0–1.0)	1.0 (1.0–1.2)	0.018	0.251
7. Feeling unable to relax	HADS-A	2.0 (0.8–2.0)	2.0 (2.0–2.0)	0.043	0.555
8. Feeling slowed down	HADS-D	1.0 (1.0–1.0)	1.0 (1.0–3.0)	0.052	0.629
9. Feeling restless	HADS-A	1.0 (0.8–1.0)	1.0 (0.0–1.0)	0.788	1.000
10. Interest in personal appearance	HADS-D	1.0 (0.0–2.0)	1.0 (1.0–2.0)	0.145	1.000
11. Feeling restless or agitated	HADS-A	1.0 (0.0–1.2)	1.0 (1.0–2.0)	0.207	1.000
12. Enjoyment of things	HADS-D	1.0 (0.0–2.0)	1.0 (0.8–2.0)	0.721	1.000
13. Feeling of panic	HADS-A	1.0 (1.0–1.0)	1.0 (1.0–1.2)	0.510	1.000
14. Enjoyment of books, television, or radio programs	HADS-D	0.0 (0.0–0.2)	0.5 (0.0–2.0)	0.100	1.000

Values are presented as median (interquartile range). Item-level scores were compared between specialties using the two-tailed Mann–Whitney U test. P values were adjusted for the 14 exploratory item-level comparisons using the Holm procedure. HADS-A: anxiety subscale; HADS-D: depression subscale.