

Determination of Depression Levels and Affecting Factors of the Residents in a Training Hospital

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ABSTRACT

Introduction: Residency training may lead to the development of depressive conditions with possible academic and professional consequences. We determined the levels of depression in resident medical doctors (RMDs) and assess the factors influencing depression.

Methods: This prospective cross-sectional questionnaire study was conducted on RMDs working in tertiary research hospital in İstanbul. Participation in the study was voluntary. A questionnaire was distributed to the RMDs participating in the study, and the Beck Depression Inventory-II (BDI-II) was used to measure depression levels. This study was presented as a paper at the 5th Eurasian Congress on Emergency Medicine and 12th Turkish Emergency Medicine Congress, November 10-13, 2016 (Antalya, Turkey).

Results: A total of 161 RMDs were included in the study (participation rate: 68.8%). Of the RMDs, 65 (40.4%) had depressive symptoms (BDI-II >13). An exploratory analysis of possible risk factors showed that working night shifts, length of residency, and department in which the resident worked were factors for the development of depressive symptoms. There was no association between BDI-II scores and age, gender, marital status, number of children, living alone, recent loss of a loved one, presence of chronic illness, diagnosis of depression, or use of antidepressant medication.

Conclusion: There is a high prevalence of depressive symptoms among RMDs, especially night workers, who have less experience in their residency. Active assessment of these RMDs to evaluate their depressive symptoms is important. Preventive measures and educational programmes to improve working conditions need to be reviewed.

Keywords: Resident doctors, depression, Beck Depression Inventory

Introduction

Depression is the most commonly observed psychiatric disorder worldwide, and there is a high level of consensus on its pathophysiology. It has become a global health issue, contributing to an 8-15% loss of functionality in developed countries (1,2). The current understanding of depression is that it is a psychiatric disorder characterized by emotional, cognitive, behavioral, and physical symptoms. Standards for diagnosing depression have been established to address the challenges in making an accurate diagnosis. These include the Diagnostic and Statistical Manual of Mental Disorders and the International Classification of Diseases, which aim for universality (3). Depression evaluation scales can be categorized as self-assessment or clinician evaluation. Examples of depression scales include the Beck and Zung scales, which involve self-evaluation, and the Hamilton, Calgary, and Montgomery-Asberg Scales, which involve clinician evaluation (4-8). The Beck Depression Inventory (BDI) was developed by Beck et al. (4) to measure behavioral symptoms

of depression in adults. The BDI was later revised in 1978 as the BDI-IA and in 1996 as the BDI-II. The BDI-II was developed in response to changes in diagnostic criteria for Major Depressive Disorder outlined in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. It is widely used by healthcare professionals and researchers in various settings as an assessment tool (9,10). Hisli (11) translated the BDI into Turkish and conducted a validity and reliability study.

Resident medical doctors (RMDs) receive diverse education across different specialties, with some residency training programs lasting four years and others lasting five years in Turkey. Factors such as marriage or delivery may extend the residency period, particularly for female RMDs. While prolonged residency time can increase experience, it can also lead to weariness. The literature contains numerous studies on depression severity in relation to RMDs in Turkey and other countries (12-20). These studies are divided into two types: department-based and institute-based,



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similar to our own study. In addition, the department-based depression studies were separated according to the specialty of residency as family physicians, anesthesiology, surgery, etc. Depression can affect a person's quality of life. It is known that as the level of depression increases, so does emotional burnout, which leads to a decrease in individual performance (21). Depression can lead to mistakes by physicians and can also contribute to the development of burnout. This condition can have negative consequences for both physicians and patients. To reduce depression, it may be beneficial to take precautions to improve working conditions and increase job satisfaction. One approach could be to follow the example of working hours in other countries, as suggested by previous studies (21-23). Moreover, it is essential to conduct nationwide studies to determine the levels of depression among healthcare professionals using a representative sampling strategy. The findings of these studies can then be used to update the conditions and factors that affect depression levels among healthcare workers.

The current study determined the prevalence of depression among RMD patients in one of Istanbul's largest research hospitals and to investigate its relationship with related risk factors.

Methods

Study Design

This was a prospective, observational, descriptive study conducted in 2012 at a training and research hospital in Istanbul with 234 RMDs. The study was approved by the University of Health Sciences Turkey, Istanbul Training and Research Hospital Clinical Research Ethics Committee (approval number: 333, date: 27.10.2022). The questionnaires were anonymous and distributed to all RMDs present at the hospital during the study period. Seventy-three (31.2%) of the RMDs did not complete or return the questionnaire and were considered as "loss data." The study assessed the remaining 161 (68.8%) RMDs (28.2±2.7 years) from surgical departments (n=56, 34.8%) and internal departments (n=105, 65.2%) using the BDI-II and a questionnaire to evaluate personal data.

Data Collection

Informed consent was obtained from the participants through face-to-face interviews. The study included a descriptive questionnaire and the BDI scale. The research data were collected using self-reported questionnaires, which consisted of two parts: a descriptive questionnaire and the BDI-II. The BDI-II was completed by the participants themselves and consisted of 14 titles with questions specific to their personal and professional lives. During the creation of the questions, we examined similar studies (21) to evaluate whether participants had environmental factors related to depression. These factors included age, gender, marital status, having children, living alone, recent loss of a loved one, presence of chronic disease, previous diagnosis of depression, use of antidepressant medication, residency department at work, current duration of residency, working status (night shift or daylight), and number of night shifts worked. The doctors working between 17.00 and 08.00 are on the night shift, whereas those working between 08.00 and 17.00 are on the day shift.

Depression Scale

The BDI-II depression scale is a self-evaluation tool that assesses depression risk and measure depression severity. The scale comprises 21 self-assessment statements and uses a quadruple Likert-type measurement. Participants were asked to rate how they felt over the past two weeks, with each question offering at least four possible answer choices of varying intensity. The scale's maximum score is 63 points, and the minimum is 0 points. The BDI-II's most recent cut-off points for depression severity were minimal depression (0-13 points), mild depression (14-19 points), moderate depression (20-28 points), and severe depression (30-63 points) (9,10).

Statistical Analysis

The study results were analyzed using the "SPSS Statistics 20.0" program. Descriptive statistics are presented as mean ± standard deviation. For comparison of more than two groups, variance analysis (ANOVA) was used with post-hoc Tukey's correction for multiple comparisons after conducting the Kolmogorov-Smirnov test. Numerical data were analyzed using Pearson's correlation, and the correlation coefficient was calculated. The statistical analysis of the numerical data employed the independent t-test, whereas the sequencing and comparison of the obtained results used the chi-square test. The Kruskal-Wallis test was applied to quantitative variables with more than two independent groups when normal distribution was not present. All analyses were performed using a two-sided significance level of 0.05 to determine the statistical significance of observed differences within the 95% confidence interval. This study was presented as a paper at the 5th Eurasian Congress on Emergency Medicine and 12th Turkish Emergency Medicine Congress, November 10-13, 2016 (Antalya, Turkey).

Results

Out of the 161 RMDs that participated in the study, the mean age was 28.2±2.7 years (range; 24-45 years), with 35.4% being female and 42.9% being married (Table 1). The mean duration of residency was 29.6±16.6 months (range; 3-66 months). Only statistically significant data were found in the subgroup analysis of the current duration of the residency, specifically in the night shift group. The other variables did not yield statistically significant results. The duration of residency in the night shift group was significantly shorter than that in the daylight group, at 28.4±16.3 months and 36.8±17.0 months, respectively (independent t-test, p=0.23). This suggests that the night shift group may be less experienced than the daylight group. Only 24 (14.9%) RMDs were included in the daylight group. According to this study, most participants were from the night shift and inexperienced groups, as determined by their shorter duration of residency. The night shift group had an average of 6.7±2.4 night shifts per month (within a range of 2-12 night shifts per month).

The mean score on the BDI-II was 12.4±9.0 (range; 0-57), indicating minimal depression, the lowest category on the BDI-II. Of the participants, 28 (17.4%) were classified as moderately or severely depressed (BDI-II ≥20). There was no statistically significant correlation between age and

Table 1. Description of the sample

Variables		Total	
		n	%
Gender	Male	104	64.6
	Female	57	35.4
Marital status	Married	69	42.9
	Single	92	57.1
Had at least one child	Yes	12	7.5
	No	149	92.5
Lived alone	Yes	46	28.6
	No	115	71.4
Lost a loved one recently	Yes	31	19.3
	No	130	80.7
Presence of a chronic disease	Yes	11	6.8
	No	150	93.2
Had reported depression	Yes	22	13.7
	No	139	86.3
Used antidepressant	Yes	8	5
	No	153	95
Department	Surgical	87	54
	Non-surgical	74	46
Residency specialty	Internal medicine	27	16.8
	Emergency medicine	21	13
	General surgery	14	8.7
	Otolaryngology	13	8.1
	Anesthesiology	10	6.2
	Orthopedics	10	6.2
	Family medicine	9	5.6
	Physical therapy	8	5
	Infection disease	7	4.3
	Neurology	6	3.7
	Ophthalmology	6	3.7
	Gynecology/obstetrics	6	3.7
	Neurosurgery	5	3.1
	Biochemistry	5	3.1
	Radiology	5	3.1
	Pathology	4	2.5
	Dermatology	3	1.9
Urology	2	1.2	
Work type	Night shifts	137	85.1
	Daylight	24	14.9
BDI-II	Minimal	96	59.6
	Mild	37	23
	Moderate	22	13.7
	Severe	6	3.7

BDI-II scores (Pearson correlation, $p>0.05$). The correlation coefficient between the duration of residency and BDI-II was 0.160, indicating a statistically significant negative correlation (Pearson correlation, $p=0.043$). This suggests that as the duration of residency decreased in the RMDs, the BDI-II score increased. There was a statistically significant decrease in the average BDI-II score between the night shift and daylight groups, with scores of 13.1 ± 9.2 points and 8.8 ± 7.1 points, respectively (independent t-test, $p=0.03$). In addition, there was a statistically significant positive correlation between the number of night shifts and the BDI-II score, although the correlation was weak (Pearson correlation, 0.203, $p=0.01$). No statistically significant differences were found among the RMDs in terms of gender, marital status, having children, living alone, recent loss of a loved one, presence of chronic disease, previous diagnosis of depression, and use of antidepressant medication during the study period with the BDI-II (Independent t-test, $p>0.05$).

Examining the distribution of departments, it was found that 87 (54%) of the RMDs were residents in surgical departments. RMDs in anesthesiology, emergency medicine, general surgery, neurosurgery, obstetrics and gynecology, otorhinolaryngology, ophthalmology, orthopedics, and urology were assigned to the surgical departments. RMDs specializing in biochemistry, dermatology, family medicine, infectious disease, internal medicine, neurology, pathology, physical medicine and rehabilitation, and radiology were assigned to non-surgical departments. The group sizes of the departments were unequal, and the internal medicine department had the highest number of RMDs ($n=27$, 16.8%). When the RMDs were evaluated with their respective departments, statistically significant differences were found in the BDI-II scores (ANOVA, $p=0.03$). The gynecology and obstetrics department had the highest average BDI-II score (23.3 ± 13.4) and was classified as a moderate depression group. When compared with other departments, the BDI-II average was found to be statistically significantly high for physical medicine and rehabilitation (5.6 ± 2.4 , $p=0.16$), orthopedics (4.2 ± 3.5 , $p=0.03$), and pathology departments (4.0 ± 1.4 , $p=0.48$). The second-highest BDI-II mean was found to be statistically significantly higher in the Otorhinolaryngology department (17.7 ± 9.3) and in the orthopedics department (4.2 ± 3.5 , $p=0.22$) in the mild depression group. There were no statistical differences found when comparing the other departments. Similarly, no statistical differences were found when comparing the surgical and non-surgical departments.

Discussion

Depressive symptoms are common among patients with RMDs. A study found that healthcare workers experience depression more frequently than the public (20). Depression has been classified into burnout-related and non-burnout-related categories, with burnout-related depression having a more difficult course. A review identified 15 heterogeneous articles on resident burnout. Research suggests that burnout levels are high among residents and may be associated with depression and problematic patient care (24). Studies have shown that residents experience depression at a higher rate than their peers who are not pursuing careers in medicine. Therefore, RMDs are at a higher risk of morbidity during their undergraduate years. Prevalence rates of depression among medical students and residents vary widely from 2%

to 35%. The highest rates have been reported among residents, ranging between 27% and 35% (17). When examining comparable studies in the literature, it is challenging to compare the distribution of depression levels because of the use of different depression screening methods and ratings based on various criteria, such as high-risk groups per medical specialization, years of experience and gender. In a study conducted by Demir et al. (12), on 156 individuals with RMDs in Turkey, the probable distribution of depression was found to be 16%. Similarly, our study found that the moderate/severe depression group was 17.4%. Identifying the causes of high levels of depression in healthcare workers may aid in the development of protective and preventive measures.

Reported risk factors for developing depression include gender (12,17), duration of residency (19), marital status, and living alone (13,25,26). In the general population, women have a higher lifetime risk of depression than men. Similarly, studies on RMDs have consistently shown higher rates in women (12,17,18,27). However, a review of studies comparing depressive symptoms by gender in medical students found no difference by gender (28). In our study, we did not find a link between gender and depression levels because the average number of RMDs in men and women was similar. This may explain why the number of male RMDs in our study was higher than that of female RMDs.

According to the study by Demir et al. (12), they said that age, marital status, hospital department, duration of residency, number of night shifts, and duration of exposure to daylight in the work environment were not associated with depression, but some studies suggest a relationship between night work and depression. For example, in a study of anesthetic RMDs in Turkey by Saricaoğlu et al. (29), it was reported that there was a direct relationship between insomnia, decreased attention, low performance, and night shifts. The intensive work schedule of healthcare workers, especially those working night shifts, leads to insomnia and fatigue. In our study, the mean BDI-II of RMD working night shifts was found to be significantly higher. There was also a statistically significant positive correlation between the number of night shifts and BDI-II. According to our study, this means that as the number of night shifts increased, so did the BDI-II.

Goebert et al. (17) reported significant differences in reporting depression among medical students by years of training, but not among RMDs. Similar to our study, Ozyurt et al. (26) reported that burnout and depression decreased with increasing years of practice. Conflicting results have been reported in studies comparing marital status with depression. However, various studies conducted in Turkey, such as our study, reported that marital status had no relationship with job satisfaction, burnout, and depression levels (13,14,30).

Study Limitations

A limitation of this study is that most of this study was formed from the night shift group and inexperienced group of residents. As two influential factors on depression were found high percentage, there was generally a high determined percentage in depression levels. Other limitations include the small number of participants and the fact that the scale was presented for statistical analysis based on scores and no categorization was used.

Although the junior doctors working in the emergency department work 24 hours a day, some of the junior doctors working in other clinics work the day shift, while others continue to work the night shift. The junior doctors who participated in the study were not grouped according to the departments in which they worked, and analysing the total number of junior doctors was one of the limitations of our study. In addition, in this study, we did not find any difference between the depression levels of RMDs in the surgical and medical departments. According to our study, the length of residency is a factor that influences depression. However, we need to study this again with groups that have the same length of residency in each department, as this may lead to different results. Also, a participation rate of 68.8% may indicate a response bias, e.g. non-participants in the survey may be more depressed than participants.

Conclusion

This study highlights the importance of an ongoing assessment of the mental health of residents. In conclusion, the BDI-II was used to assess the depression levels of RMDs, and it was found that night shift work, length of stay, and the department in which they worked were factors in the development of depressive symptoms. In addition to a better knowledge of the characteristics of depressive symptoms, our findings could help us to develop programmes specifically designed for RMDs to prevent the development of depression.

Ethics Committee Approval: The study was approved by the University of Health Sciences Turkey, İstanbul Training and Research Hospital Clinical Research Ethics Committee (approval number: 333, date: 27.10.2022).

Informed Consent: Informed consent was obtained from the participants through face-to-face interviews.

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