ORIGINAL ARTICLE

A study of depression and anxiety among doctors working in emergency units in Denizli, Turkey

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Background: Major work has been carried out on the psychological well-being of emergency room doctors in the US, Canada and in other developed countries, but little has been published regarding the same in the countries in economic transition.

Objective: To determine the level of, and the factors related to, depression and anxiety among doctors working in emergency units in Denizli, Turkey.

Methods: This cross-sectional study was conducted in May 2004, using a sample of 192 doctors employed in emergency units in Pamukkale University Hospital, the City Hospital, the Social Security Hospital, private hospitals, citywide primary healthcare centres and 112 emergency services in Denizli, Turkey. Data were obtained using a self-administered questionnaire, including questions on sociodemographic characteristics and two instruments determining the level of depressive symptoms and anxiety. Logistic regression was the method chosen for multivariate statistical analysis.

Results: The mean (standard deviation (SD)) depression score was 10.6 (6.5) and the frequency (%) of depression was 29 (15.1). Not having any hobby and having high anxiety scores were salient factors among doctors experiencing depressive symptomatology in bivariate comparisons. Logistic regression analysis showed that not having any hobby ($p=0.07$) and having increased anxiety scores ($p<0.001$) were positive contributors to depression scores. The mean (SD) anxiety score was 8.7 (8.2) and the frequency (%) of anxiety was 28 (14.6). Being a woman, having a low monthly income and having high depression scores contributed considerably to the anxiety of doctors in bivariate comparisons. Low monthly income (<1000 *v* 1000–2000 YTL) ($p=0.03$), the number of years spent in emergency units ($p=0.03$) and having high depression scores ($p<0.001$) were the factors that contributed significantly to the anxiety of doctors in the multivariate regression analysis.

Conclusion: The considerable amount of depression and anxiety found among doctors in this study should trigger further work. Studies using more powerful designs would help to illuminate the factors leading to depression and anxiety, which result in attrition among doctors from emergency units.

Several occupational hazards have put the physical and psychological well-being of doctors working in emergency units in jeopardy.[1] The likelihood of being exposed to infectious agents seems to be higher in emergency units than in other medical settings.[1 2] The increased risk of workplace violence, of having coronary artery disease and of having impaired reproductive health are other problematic conditions worth mentioning.[2–4] Traditionally, it has also been recognised that the emergency unit environment exposes doctors to stress, which causes burnout, frustration and, eventually, a shortened career span.[5–11] Several studies have shown that a considerable number of emergency doctors experience depersonalisation and depression.[12 13] Important work on depression and anxiety has been carried out on doctors working in emergency units in the US, Canada and in other developed countries, but little has been published regarding the same in the countries in economic transition.

We have serious concerns in Turkey about the attrition rate of doctors working in emergency units, which is currently unknown. The Turkish healthcare system has been experiencing major changes since early 2000.[14] Attempts to regionalise the healthcare system have created new challenges. Opportunities for improvement exist in the current environment; however, there is also a risk of insufficient emergency healthcare services being provided to the community. Progress in working conditions and improvement in the psychological health of doctors are predicted to be the determining factors for the success or failure of the latest changes. Current findings on the psychological well-being of doctors in the field are especially expected to be valuable to doctors working in emergency units, healthcare planners and managers who seek to provide optimal emergency healthcare for people in the countries in economic transition. Our study aimed to determine the level of depression and anxiety, together with their associated factors, which cause burnout among doctors working in emergency units in Denizli, Turkey.

METHODS

Study design and participants

This cross-sectional study targeted all doctors working in emergency units in the Pamukkale University Hospital, the City Hospital, Social Security Hospital, citywide primary healthcare centres, 112 emergency services and private hospitals in Denizli, Turkey. The study was conducted in May 2004, and a sample of 192 doctors (90% of the targeted group) participated. Denizli is located in the Aegean region, which is a relatively developed part of Turkey, and the population is close to half a million. Most of the doctors in this region are government employees. However, there are always opportunities to switch to private hospitals or private practice, to work as a full-time occupational doctor, or to transfer to another place in the government-run healthcare system. Despite the recent improvements in salary, the

Abbreviation: BDI, Beck Depression Inventory

salaries of emergency room doctors in Turkey are still low compared with those of the doctors in the Organisation for Economic Co-operation and Development countries.

Data collection

Participants completed a self-administered questionnaire during an emergency unit certification programme. The first part of the questionnaire included questions on sociodemographics of the participants. The degree of depressive symptoms was measured by the Turkish version of the 21-item revised form of the Beck Depression Inventory (BDI).[15 16] The BDI has statements ranked from 0 to 3, with 0 being the least serious and 3 representing the most serious. Scores of $\geqslant$17 provide a measure of self-reported depressive symptomatology for categorisation. Cronbach's α for this sample was 0.83. Anxiety symptoms were evaluated using the Beck Anxiety Inventory. Scores range from 0 to 63, with higher values indicating more anxiety symptoms.[17] Scores of $\geqslant$16 provide a measure of self-reported anxiety symptomotology for categorisation. Cronbach's α for this sample was 0.90.

Statistical analysis

Prevalence was estimated in the usual manner. χ^2 analysis was used to deal with questions on relationships among variables with dichotomous or categorical response. Variables that were either relevant at the bivariate comparisons or the subject of interest for the researchers were included as backward logistic regressions. The results are reported as β's (coefficients of regression) and standard error (SE) of β's. The SPSS statistical package for Windows V.10 was used for data analysis.

RESULTS

A total of 192 doctors were included in the study. Many of the participants were between 20 and 45 years of age. Married male doctors working in the City Hospital made up the majority (table 1). The mean (SD) depression score was 10.6 (6.5) and the frequency (%) of depression was 29 (15.1). Not having a hobby and having high anxiety scores were the important factors among doctors experiencing depressive symptomatology in bivariate comparisons (table 1). Logistic regression analysis showed that not having any hobby and having an increased anxiety score were positive contributors to BDI scores (table 2). The mean (SD) anxiety score was 8.7 (8.2) and the frequency (%) of anxiety was 28 (14.6). Being a woman, having a low monthly income and having high depression scores were factors that contributed saliently to the anxiety of doctors in bivariate comparisons (table 1). Low monthly income, years spent in emergency units and having high depression scores were the factors that contributed saliently to the anxiety of doctors in the multivariate regression analysis (table 2). Although it is not significant, the number of predicted future years of working in emergency units decreased as the depression and anxiety scores increased (table 1).

DISCUSSION

Our study found that approximately 15% of doctors working in emergency units in Denizli had depressive symptomatology. Several previous studies from different parts of Turkey reported a comparable rate of depression among university students[18 19] and medical doctors.[20 21] Studies on doctors in the developed world indicating depressive symptomatology yielded results such as 19.3% in the US, 15.5% in Canada and 18.0% in the UK.[5–7] In a multinational study completed in the UK, US and Australasia, the doctors from UK showed higher work-related stress and depression levels.[10] Another observation indicated that the rate of depression among general practitioners was 27% and the rate of suicidal thoughts 13%. The rate of depression among specialists was 19%, whereas it was only 6% among administrators.[22] This study found that approximately 14.6% of doctors working in emergency units in Denizli had high anxiety scores. These results are consistent with several other studies conducted in Turkey and elsewhere in the world.[20–23]

Male and female doctors showed different but non-significant depression scores in this study. The same observation for sex differentials in anxiety levels was also true. However, anxiety levels in female doctors were different from those in male doctors. The incidence of depression in young female doctors was found to be higher than in their male colleagues in a previous study.[24] The Emergency Medical Residents Association reported higher average stress levels among female doctors.[25] Also, female doctors showed more frequent depressive symptomatology than their male counterparts.[10] Arnetz *et al*[26] reported an increased risk of suicide in educated women. They speculated that it may reflect the similar high suicide rates among other career women and may be due to the conflict of motherhood, spousal duties and career targets. Another study from the UK reported that the conflict between work life and daily life was a major stressor in the life of a female doctor.[11] On the other hand, another study found that the depression rate in female doctors did not vary from that of the general public, but the rate of successful suicide was much higher.[27] Possible harassment can create an extra source of stress for women in emergency units.[5 7 10 27–29] Additionally, female doctors are often exposed to stresses associated with discrimination in the workplace. For example, female residents reported that they ''felt left out of conversations which may have been of interest'' to them and were ''subject to stereotypical behaviour based on preoccupations with their gender status''.[5] It unfortunately seems that extra pressures on female doctors in general will continue until attitudes and practices in institutional settings change.

Marital status did not make any difference in depression and anxiety scores among doctors in this study. However, divorced doctors showed higher depression and anxiety scores. Several studies from Western countries have indicated that marriage is a preventing factor for depression.[5 6 13 30] Although financial difficulties and extra responsibilities due to family life may increase the possibility of negatively affecting doctors' psychology, the family's social support mechanisms seem to be at play in preventing depression and anxiety. A study from the UK showed the protective effect of marriage.[7] Doctors who were not married reported higher levels of depression than married doctors, as was the case in earlier studies of US residents[9] and doctors pursuing postgraduate training in emergency medicine in the three survey sites.[10] Married doctors reported markedly lower levels of depressive symptomatology in a US sample.[5] Keller and Koenig[31] have reported comparable results. Interestingly, in this study, doctors with children showed lower depression and anxiety scores. The reason for this is not clear. However, having children may motivate and increase a person's attachment to life. Hobbies seem to reduce doctors' depression and anxiety scores. This observation is compatible with the literature. Emergency room doctors can promote their own well-being by sparing time for hobbies.

Age of doctors showed a U-type association with depression and anxiety in doctors working in the emergency room. Depression and anxiety were high among doctors in the youngest and oldest age strata, but low among doctors in the 36–45 years category. Our findings in regard to high depression levels in young doctors are compatible with the literature. Valko and Clayton[32] found that 30% of doctors showed depression just a year after graduation. Hsu and Marshall[33] reported another similar finding. In another study,

Table 1 Description of the sample and association of depression and anxiety with sociodemographic and work-related factors in emergency room doctors

		Depression			Anxiety		
Variables	No (%) of doctors	BDI scores mean (SD)	No (%) of doctors with depressive symptoms*	p Value	BAI scores mean (SD)	No (%) of doctors with moderate to severe anxiety†	p Value
Total	192 (100)	10.6 (6.5)	29 (15.1)	—	8.7 (8.2)	28 (14.6)	—
Age (years)							
20–35	85 (44.3)	11.1 (6.4)	15 (17.6)	0.6	9.8 (9.0)	14 (16.5)	0.1
36–45	94 (49)	10.3 (6.3)	12 (12.8)		7.3 (7.3)	10 (10.6)	
>45	13 (6.8)	9.3 (8.0)	2 (15.4)		9.2 (9.2)	4 (30.8)	
Sex							
Male	154 (80.2)	10.3 (6.04)	21 (13.6)	0.2	7.84 (7.58)	18 (11.7)	0.02
Female	38 (19.8)	12.0 (8.06)	8 (21.1)		12.36 (9.8)	10 (26.3)	
Marital Status							
Unmarried	23 (12)	10.2 (7.51)	3 (13)	0.7	8.30 (9.29)	4 (17.4)	0.6
Married	161 (83.9)	10.4 (6.26)	24 (14.9)		8.68 (8.13)	22 (13.7)	
Divorced	8 (4.2)	15.3 (7.30)	2 (25)		11.00 (7.92)	2 (25)	
Workplace							
112 emergency services	47 (24.5)	10.3 (5.42)	5 (10.6)	0.6	8.85 (7.66)	8 (17)	0.5
City Hospital	68 (35.4)	11.0 (6.29)	13 (19.1)		8.88 (8.44)	7 (10.3)	
Primary healthcare centres	56 (29.2)	9.71 (6.00)	7 (12.5)		7.75 (7.77)	8 (14.3)	
Social Security Hospital	18 (9.4)	12.8 (10.23)	3 (16.7)		10.55 (10.35)	4 (22.2)	
University Hospital	3 (1.6)	11.6 (8.73)	1 (33.3)		11.33 (10.26)	1 (33.3)	
Having children							
No	148 (22.9)	10.6 (6.37)	21 (14.2)	0.3	8.23 (7.51)	19 (12.8)	0.2
Yes	44 (77.1)	10.6 (6.98)	8 (18.2)		10.43 (10.23)	9 (20.5)	
Years in medicine							
0–5	16 (8.3)	11.9 (6.8)	5 (31.3)	0.17	10.4 (6.7)	4 (25)	0.3
6–10	60 (31.3)	10.8 (6.23)	8 (13.3)		9.91 (9.84)	10 (16.7)	
>10	116 (60.4)	10.4 (6.63)	16 (13.8)		7.89 (7.44)	14 (12.1)	
Work type							
Normal shift	18 (9.4)	10.3 (4.29)	2 (11.1)	0.2	5.83 (7.08)	1 (5.6)	0.07
24-h shift	150 (78.1)	10.3 (6.10)	21 (14)		8.50 (7.98)	20 (13.3)	
Day or night shift	17 (8.9)	11.7 (6.80)	3 (17.6)		10.52 (6.92)	4 (23.5)	
Normal and 24-h shift	7 (3.6)	15.7 (14.49)	3 (42.9)		16.85 (14.0)	3 (42.9)	
Work hours (per month)							
⩽160	49 (25.5)	10.4 (5.2)	6 (12.2)	0.6	12.00 (9.89)	8 (16.3)	0.8
161–180	84 (43.8)	10.1 (6.1)	12 (14.3)		17.5 (17.67)	11 (13.1)	
>180	59 (30.7)	11.5 (7.9)	11 (18.6)		8.16 (8.46)	9 (15.3)	
Hobbies							
No	105 (54.7)	9.6 (5.54)	10 (9.5)	0.02	7.80 (7.29)	11 (10.5)	0.08
Yes	87 (45.3)	11.9 (7.33)	19 (21.8)		9.87 (9.17)	17 (19.5)	
Habits							
Cigarette smoking	65 (33.9)	11.0 (5.95)	7 (10.8)	0.4	9.44 (8.43)	12 (18.5)	0.6
Alcohol	12 (6.8)	13.3 (8.23)	3 (25)		8.58 (7.24)	1 (8.3)	
Both	15 (7.8)	11.8 (7.80)	2 (13.3)		10.33 (7.83)	2 (13.3)	
Another work							
No	89 (46.4)	11.2 (7.13)	17 (19.1)	0.15	9.88 (9.38)	15 (16.9)	0.4
Yes	103 (53.6)	10.1 (5.88)	12 (11.7)		7.74 (7.00)	13 (12.6)	
Working years in ER							
0–5	90 (46.8)	10.3 (6.1)	14 (15.6)	0.7	8.9 (8.4)	11 (12.2)	0.07
6–10	64 (33.3)	10.5 (5.3)	8 (12.5)		7.75 (6.7)	7 (10.9)	
>10	38 (19.7)	11.5 (6.0)	7 (18.4)		10.0 (9.9)	10 (26.3)	
Predicted future years in ER							
<5 years	27 (14.1)	11.5 (7.9)	6 (22.2)	0.4	10.7 (8.8)	7 (25.9)	0.16
5–10 years	75 (39.1)	9.5 (10.6)	9 (12.0)		8.1 (7.0)	11 (14.7)	
>10 years	90 (46.9)	10.9 (6.9)	14 (15.6)		8.6 (8.9)	10 (11.1)	
Monthly income							
<1000 YTL	24 (12.4)	14.3 (7.8)	6 (25)	0.3	13.5 (10.0)	9 (37.5)	0.003
1000–2000 YTL	125 (0.65)	10.3 (6.1)	18 (14.4)		7.9 (7.9)	13 (10.4)	
>2000 YTL	43 (22.3)	9.6 (6.2)	5 (11.6)		8.4 (7.3)	6 (14.0)	
Depression							
No	163 (84.4)	8.6 (3.8)	0 (0)		6.8 (5.8)	13 (8.0)	<0.001
Yes	29 (15.1)	22.4 (6.02)	100 (100)		19.3 (11.3)	15 (51.7)	
Anxiety							
No	164 (85.4)	9.3 (4.9)	14 (8.5)	<0.001	6.06 (4.5)	0 (0)	
Yes	28 (14.6)	18.5 (8.7)	15 (53.6)		24.3 (7.7)	100 (100)	

BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; ER, emergency room.
*BDI scores were dichotomised using 17 as the cut-off point. This column shows the percentage of people with BDI scores ⩾17.
†BAI scores were dichotomised using 16 as the cut-off point. This column shows the percentage of people with BAI scores ⩾16.

depression and anxiety scores among doctors got lower as the years in medicine increased, but stayed higher than that of the general public.[29] Another previous study claimed that increased age was a major contributor to decreased scores for depersonalisation and depression, and was also an important factor associated with increased scores for personal accomplishment and job satisfaction.[6] Our findings in regard to high depression levels in the doctors in the oldest age

Table 2 Multivariate analysis showing the factors associated with depression and anxiety in emergency room doctors

	β	SE	p Value
Depression*			
Hobby (yes)	−0.81	0.46	0.07
Anxiety (no)	−2.439	0.47	<0.001
Anxiety†			
Monthly income			
<1000 YTL *v* 1000–2000 YTL	2.205	0.81	0.007
1000–2000 YTL *v* >2000 YTL	0.023	0.64	0.97
Years in ER	0.165	0.055	0.03
Depression (no)	−2.73	0.54	<0.001

ER, emergency room; YTL, Yeni Türk Lirasi.
*The multivariate model comes from a backward logistic regression analysis. The model started with sex, hobbies, monthly income, marital status, years in medicine, work hours and anxiety.
†The multivariate model comes from a backward logistic regression analysis. The model started with sex, hobbies, monthly income, marital status, years in ER, work hours and depression.

category conflict with those in the literature, which often indicates that being older and being more experienced (the ''survivor category'') are protective factors for the psychological well-being of doctors.[6 12 34] Additionally, doctors working in emergency units for >10 years had the highest depression (18.4%) and anxiety (26.3%) scores in this study. Although we have no explanation for the high depression and anxiety scores observed in the oldest age strata, further studies in the countries in economic transition will be needed before a conclusion can be reached. Also, the small numbers in this age category in our study imply that more care needs to be taken while interpreting these findings.

More than half the emergency room doctors in this sample had a second job. These doctors showed low depression and anxiety scores, which is inconsistent with findings from other research from the developed world.[35] A second job may take up a major part of the doctors' time, consequently preventing them from participating in social activities. However, the extra money earned may motivate them, improve their quality of life and thus help in reducing the risk of depression and anxiety. This speculation is supported by the observation of doctors earning <1000 Yeni Türk Lirasi (approximately $750 in 2006) having the highest depression and anxiety scores. Also, the type of second job for emergency room doctors in Turkey may be considerably different from that in other countries. Occupational medicine, which is a 2-h or 4-h a week, very light, daytime, but well-paid job, was the most frequently disclosed second job in the study.

The frequency of smoking was found to be very high. However, alcohol use was found to be low. Also, depression was found to be higher in doctors who drank alcohol, and anxiety rates were higher in doctors who smoked. Studies from Western countries have shown that alcohol use among doctors was higher than that among the general public. Excessive alcohol use can be a reflection of depression. More specifically, it can be a way of dealing with depression.[29] We found alcohol use to be very low in this study. This might be the result of religious influence or perhaps of masking the truth due to social pressure. Emergency room doctors did not report any daily substance use. The literature supports that emergency room doctors have higher rates of substance use and misuse than doctors in other medical specialties.[27] A previous study reported that emergency medicine residents have higher rates of substance use than residents in other specialties, and they were markedly more likely to report current use of cocaine and marijuana.[36]

A limitation of this study is its cross-sectional design. Therefore, it is difficult to assess the direction of influence and it precludes us from making causal inferences about our findings. However, sufficient sample size, success in reaching most of the targeted group, and the use of valid scales to classify depressive and anxiety symptoms of the doctors in our study increase its validity, and the generalisability of our results to other emergency room doctors in Turkey.

In conclusion, a marked amount of depression and anxiety among doctors found in this study should trigger further work. Studies using more powerful designs would help to illuminate the factors leading to depression and anxiety, which lead to attrition among doctors from emergency units.

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