Original Article

Prevalence of Burnout and Psychiatric Illness among Postgraduate Trainee Doctors of a Tertiary Care Hospital

Surjya Roy, M.D.[1], Nitu Mallik, M.D.[1], Indranil Saha, M.D.[1], Subhendu Datta, M.D.[1], Asim Kr Mallick, M.D.[2]*

[1]Department of Psychiatry, Medical College Kolkata, [2]College of Medicine and Sagore Dutta Hospital, Kolkata, West Bengal, India

Abstract

Objective: Burnout is a state of physical and emotional depletion, and it is a result of prolonged exposure to the stressful working environment. Burnout has three primary symptoms: (a) emotional exhaustion (EE) occurs due to a depletion of emotional resources, feeling no longer to give any more to their job; (b) depersonalization (DP) occurs in response to EE, making employees detached from their job and developing uncaring attitudes to their work; and (c) reduced personal accomplishment (PA) with perceiving less enjoyment from their work. Psychological distress is also higher among medical students and doctors than that in the general population. In this study, we intended to study the prevalence of burnout and various psychological problems among postgraduate trainee (PGT) doctors of a tertiary care hospital. **Methods:** In this cross-sectional study of one year, we recruited postgraduate training doctors whoever gave valid and informed consent. **Results:** We included 170 PGTs from various clinical departments at the time of our study, but 126 PGTs were included as the sample population. They were assessed for sociodemographic determinants first. Then received assessment using sociodemographic pro forma and Abbreviated Maslach Burnout Inventory and International Classification of Diseases 10 for screening psychiatric morbidity among them. **Results:** In this study, 31.7% of PGTs had high EE, 34.9% of them higher DP, and 30.2% of them a high burnout rate. Of them, 31.7% of PGTs had a reduced PA with a score ≤ 25 percentile. In this study, 83.3% had no psychiatric illness and 16.7% had a psychiatric disorder. Among psychiatric disorders, 4% had harmful use of tobacco, 4% had mild depression, 1.6% had panic disorder, 4.8% had mixed anxiety depression, 1.6% had obsessive-compulsive disorder, 0.8% had harmful use of alcohol. Highest EE was noted among PGTs from the Department of Anesthesiology, followed by those from the Departments of Pulmonary Medicine and then Radiotherapy. **Conclusion:** One-third of PGTs suffered from burnout. Psychiatric diseases were also increased with a higher burnout rate.

Key words: abbreviated Maslach Burnout Inventory, depersonalization, emotional exhaustion, psychiatric diseases
***Taiwanese Journal of Psychiatry* (Taipei) 2022; 36: 176-181**

Introduction

Burnout is a state of physical and emotional depletion which is a result of prolonged exposure to stressful working environment [1]. Long-hour shifts, too much or too little work, conflicting demands of work, poor management, bad relations with colleagues, frequent job changes, the job with high emotional demands, and poor working environment are the common causes of stress at work.

Maslach defined burnout as being characterized by three primary symptoms. Emotional exhaustion (EE) refers to a depletion of emotional resources, and they feel that they can no longer give any more to their job. Depersonalization (DP) occurs in response to EE, making employees detached from their job and developing uncaring attitudes toward their work. Reduced personal accomplishment (PA), where employees perceive less enjoyment from their work. Burnout does not occur overnight, rather occurs as a result of a prolonged and slow process that can last for years [2]. In other words, EE may lead to the DP stage of burnout [3]. DP is seen as "an ego-defense mechanism" to reduce stress. Reduced PA causes both stress and EE to build up [4].

[1*]Corresponding author. Ezra Building (Near Gate No. 1), 88, College Street, Kolkata - 700 073, West Bengal, India.
E-mail: Subhendu Datta <drsubhendu76@gmail.com>

Received: Oct. 22, 2022 revised: Nov. 18, 2022 accepted: Nov. 19, 2022
date published: Dec. 27, 2022

Access this article online

Quick Response Code:

Website: www.e-tjp.org

DOI: 10.4103/TPSY.TPSY_36_22

How to cite this article: Roy S, Mallik N, Saha I, Datta S, Mallick AK. Prevalence of burnout and psychiatric illness among postgraduate trainee doctors of a tertiary care hospital. Taiwan J Psychiatry 2022;36:176-81.

Psychological distress is higher among medical students and doctors than those in the general population [5]. Previous studies have shown an increased incidence of severe psychological distress along with a two-fold increased incidence of suicidal ideations in physicians compared with the general population. Psychiatric morbidities and burnout among medical professionals are often associated with more medical errors and poor patient outcomes [6, 7]. Medical professionals are also prone to abusing various substances and developing substance-use disorders. Studies have shown a high prevalence of nicotine dependence and use of other substances such as alcohol, cannabis, and benzodiazepines [8, 9].

Mental health problems are growing in the medical fraternity and the risk of suicide is also up surging day by day; a need to assess mental health issues exists among resident doctors who are going to enter in their professional field later on. That can change the policies regarding duty hours, training and teaching techniques, as well as examinations procedure of residents. In this study, we intended to study the prevalence of burnout and various psychological problems among postgraduate resident doctors of a government-funded tertiary care hospital in India.

Methods

Study setting and participants

The participants of this study were recruited from Burdwan Medical College and Hospital, Burdwan, West Bengal, India. It was a cross-sectional study of one year. The study protocol was approved by the Institute Ethics Committee at Burdwan Medical College (protocol number = BMC/PG/4457 and the date of approval = December 14, 2015) with the stipulation of obtaining signed informed consent to participate in this study.

Totally, 170 postgraduate trainees (PGTs) were posted in various clinical departments at that time. All of them had been approached. We recruited those who were (a) available in their respective department in the stipulated time period of data collection, and (b) willing to participate, and (c) gave valid, informed consents. Thus, we included 126 PGTs as the sample population.

Study tools

Semi-structured sociodemographic proforma

A specially designed semi-structured sociodemographic proforma was formulated using 11 parameters such as age, background, subject, religion, address, language, income, relationship, gender, family, and the year of postgraduate training.

Abbreviated Maslach Burnout Inventory

Abbreviated Maslach Burnout Inventory [2-4, 10] consists of three subscales to measure EE, DP, and reduced personal accomplishment:

Emotional exhaustion

EE has three items. Each item has six responses. Score ranges from 0-18. Higher scores indicate greater EE and greater burnout.

Depersonalization

DP has three items. Each item has six responses. Score ranges from 0-18. Higher scores indicate greater DP and greater burnout.

Personal accomplishment

PA has three items. Each item has six responses. Score ranges from 0 to 18. Higher scores indicate greater PA and less burnout.

Depending on the conceptualization of burnout, individuals can be considered burntout based on high scores (75th percentile or higher) on EE, in combination with either a high DP score or a reduced PA score (www.occenvmed.com) [11].

In this study, a recommended guideline has been followed, i.e., a high-level burnout was determined by combining the high scores for EE and DP (≥ 75 percentiles) [3, 4]. For this purpose, a summation of EE and DP has been denoted as burnout.

Diagnostic guideline from International Classification of Diseases, 10th revision, *Diagnostic Criteria for Research*

We made the diagnoses of psychiatric disorders for the study subjects according to *International Classification of Diseases* (*ICD*)-10 Diagnostic Criteria for Research.

Statistical analysis

Descriptive analyses were computed in mean ± standard deviation for continuous variables and frequency with percentage for ordinal and nominal variables. Student's unpaired *t* test was done to find a comparison and level of significance between the two variables. We also did an analysis of variance (ANOVA) to find comparison and level of significance between more than two variables with continuous variables. Chi-square test was done to find comparison and level of significance between two or more than two variables, when the data were categorical. Correlations between the variables were assessed using Pearson's test. Pearson's correlation coefficient of + 1 indicates a perfect positive correlation (both values rises together), whereas correlation coefficient − 1 indicates perfect negative correlation (when one value rises, the other value decreases).

We computed all study variables with the Statistical Package for the Social Science software version 20 for Windows (SPSS Inc., Chicago, Illinois, USA). The differences were considered significant if *p*-values were less than 0.05 two-tailed.

Results

Totally, 126 PGTs were recruited in this study. Of them, 14 were from the Department of General Medicine, 10 Orthopedics, 21 General Surgery, 12 Gynecology and Obstetrics, 13 Pediatrics, 6 Opthalmology, 5 Otorhinolaryngology, 10 Psychiatry, 9 Anesthesiology, 4 Pulmonary Medicine, 8 Dermatology, 6 Radiotherapy, and 8 Radiodiagnosis.

Table 1 shows that most of the PGTs had no psychiatric disorder (83.3%). Rest 16.7% PGTs had psychiatric disorders

Table 1. Distribution for psychiatric illness among postgraduate trainees

	n (%)
Absent psychiatric disorder	105 (83.3)
Harmful use of tobacco	5 (4)
Depression	5 (4)
Panic disorder	2 (1.6)
Mixed anxiety and depressive disorder	6 (4.8)
Mixed obsession thought and act	2 (1.6)
Harmful use of alcohol	1 (0.8)

Table 2. Prevalence of burnout among postgraduate trainees

	Mean ± SD	Explanation
EE	7.19 ± 3.52	31.7% PGT had higher EE (score ≥ 75 percentile)
DP	3.50 ± 3.27	34.9% PGT had higher DP (score ≥ 75 percentile)
PA	13.54 ± 2.62	31.7% PGT had PA ≤ 25 percentile and 57.9% PGT had PA ≤ 50 percentile

EE, emotional exhaustion; DP, depersonalization; PA, personal accomplishment; PGT, postgraduate trainee; SD, standard deviation

(diagnosed by *ICD*-10). Table 2 shows the prevalence of burnout among PGTs.

Figure 1 shows burnout and PA score among PGTs of differentclinical departments. PGTs suffered from high burnout rates were from the Department of Anesthesia, followed by the Departments of Pulmonary Medicine and Radiotherapy. PGTs had low burnout rates were from the Departments of Dermatology, Psychiatry, and Pediatrics.

Table 3 compares psychological morbidity with nine sociodemographic parameters. The significant difference with psychiatric diseases was seen with four domains of sociodemographic profile such as religion ($p < 0.05$), income ($p < 0.05$), relationship ($p < 0.01$), and year of postgraduate residency ($p < 0.05$).

Table 4 gives further detailed studies on burnout and reduced personal accomplishment under the relation of PGT seniority and marital status. PGTs in the 3rd year ($p < 0.01$) and those with married status ($p < 0.05$) were found to be more significantly vulnerable to burnout. PGTs with married status were found to have more significantly reduced personal accomplishment ($p < 0.05$).

Table 5 gives further detailed studies on burnout and reduced personal accopmplishment under the relation of the gender of PGTs and psychiatric disease. The effect of gender was found no significant difference in both sexes. The presence of psychiatric disease in PGTs had significantly increased burnout ($p < 0.001$) and significantly reduced PA ($p < 0.001$).

Discussion

Of 170 PGTs, we recruited 126 of them in this study. The participation rate of all PGTs was 74.12%. Zuraida and Zainal [4] have measured burnout among 117 junior doctors in Malaysia. In another cross-sectional study, Bore et al. have studied predictors of psychological distress among 127 undergraduate medical students in Australia [12]. Those two sample sizes [4, 12] are quite similar to the number of study participants in our study.

In the present study (Table 2), 31.7% had high EE (score ≥ 75 percentile), 34.9% PGTs had higher DP, 30.2% of them had high burnout rate (EE + DP ≥ 75 percentile). Totally, 31.7% PGTs had low PA score ≤ 25 percentile. Following the same scale and same diagnostic criteria, Zuraida and Zainal found burnout among Malaysian junior doctor at 26.5% [4]. With the same scale, Cook et al. have also found 34.1% burnout rate among medical students [13]. These results are quite similar to that in our study. Burnout among PGT doctors can be explained by various factors like long duty hours, night duties, the pressure of studies and thesis work, lack of vacation, lack of autonomy, externally forced entry to the subjects, pressure of higher authority, pressure at the preparatory time of examinations, and also a family burden. Poor working environment and bad interpersonal relationships among doctors are a causative factor of high burnout rate. An utmost need is felt to increase communications between seniors, juniors, colleagues regarding professional and personal issues. In another study by Cecil et al. [14], they found that 54.8% have high EE, 34% high DP, 46.6% low PA among medical students at Manchester, United Kingdom. Ishak et al. found that prevalence of burnout is around 49% in medical students in the USA [15]. These prevalences in European country and USA are quite higher than that in our study. They have higher lawsuit rates against practicing doctors, different work environments may be a cause of higher burnout rate than that in India.

In this study (Table 1), 83.3% had no psychiatric illness, 16.7% had psychiatric disorder. Among psychiatric disorder, 4% had harmful use of tobacco, 4% mild depression, 1.6% panic disorder, 4.8% mixed anxiety depression, 1.6% obsessive and compulsive disorder, 0.8% harmful use of alcohol (diagnosed with *ICD 10*).

In a previous study, high stress and a high prevalence of mental health problems were found among medical students (17%–33%) [16]. Sreeramareddy et al. found that the prevalence of psychiatric diseases was 20.9% among undergraduate medical students of Nepal [17]. In a previous study among PGT doctors, prevalence of anxiety disorders based on *DSM IV* criteria are 13.2%, including generalized anxiety disorder (4.9%), obsessive-compulsive disorder (3.4%), specific phobia (2.4%), social phobia (1.5%), and substance-induced anxiety disorders (1.0%) [18]. Aminazadeh et al. found that 22% have been reported to have mental and emotional problems during being a Canadian surgical resident, and anxiety, depression, panic attacks are common among them [19]. In this study (Table 1), the rates of psychiatric problems were found to be low than those in the other studies. We suggest that the findings may be due to the stigma among doctors recognizing any mental health symptoms among themselves. They were reluctant to expose the fact of contact with the psychiatrist in lifetime. Those having major problem were reluctant to participate in the study as fear of being recognized as "psycho patients." We suggest that we need to

Table 3. The relation of presence of psychiatric disease and various sociodemographic variables

	Absence of psychiatric disease (n = 105), n (%)	Presence of psychiatric disease (n = 21), n (%)	χ^2 (df)
Background			
Urban	81 (64.3)	18 (14.5)	0.76 (1)
Rural	24 (19.0)	3 (2.4)	
Religion			
Hindu	93 (73.8)	20 (15.9)	7.49 (2)*
Muslim	12 (9.5)	0	
Christian	0	1 (0.8)	
Address			
West Bengal	88 (69.8)	17 (13.5)	0.10 (1)
Outside Bengal	17 (13.5)	4 (3.2)	
Language			
Bengali	89 (70.6)	19 (15.1)	0.47 (1)
Hindi	16 (12.7)	2 (1.6)	
Income			
≤ 40,000	88 (69.8)	13 (10.3)	5.28 (1)*
> 40,000	17 (13.5)	8 (6.3)	
Marital status			
Married	32 (25.4)	14 (11.1)	10.32 (2)**
Being in a relationship	53 (42.1)	4 (3.2)	
Single	20 (15.9)	3 (2.4)	
Sex			
Male	74 (58.7)	10 (7.9)	4.11 (1)
Female	31 (24.6)	11 (8.7)	
Family			
Joint	30 (23.8)	3 (2.4)	4.08 (2)
Nuclear	32 (25.4)	11 (8.7)	
Extended nuclear	43 (34.1)	7 (5.6)	
Year			
1st	35 (27.8)	6 (4.8)	7.32 (2)*
2nd	40 (31.7)	3 (2.4)	
3rd	30 (23.8)	12 (9.5)	

*p < 0.05; **p < 0.01 with Chi-square test significantly different between two groups of presence and absence of psychiatric disease

Table 4. Comparison of burnout and reduced personal accomplishment with senority in year of residency and marital status

Variables	Burnout (EE + DP)	F (df)	PA	F (df)
Year of residency				
1st (n = 41)	9.59 ± 5.38	12.48 (2)***	13.61 ± 2.86	2.07 (2)
2nd (n = 43)	8.47 ± 3.85		14.07 ± 2.39	
3rd (n = 42)	14.07 ± 6.78		12.93 ± 2.52	
Marital status				
Married (n = 46)	12.37 ± 5.63	3.55 (2)*	12.63 ± 2.61	4.72 (2)*
Being in a relationship (n = 57)	9.30 ± 5.63		14.145 ± 2.50	
Single (n = 23)	10.83 ± 6.62		13.87 ± 2.51	

*p < 0.05; ***p < 0.001 with Chi-square test significantly different between three groups of year of residency and marital status.
EE, emotional exhaustion; DP, depersonalization; PA, personal accomplishment

have psychiatric counseling programs frequently to reduce stigma and to motivate them to seek help from mental health professional when needed.

As shown in Figure 1, the highest EE was found among PGTs from the Departments of Anesthesiology, Pulmonary Medicine, and Radiotherapy. Highest score of DP was noted among PGTs from the Departments of Pulmonary Medicine, Otorhinolaryngology, and Radiotherapy. Highest score of PA was seen in PGTs from the Departments of Orthopedics, Dermatology, and Pediatrics (Figure 1). Zuraida and Zainal found that trauma and emergency unit are associated with a higher score of burnout [4]. One study presented a burnout in ICU health-care professionals 14.5% and 21.9% in the oncology department, 17.5% in the operating room, 17.2% in the surgical department and 12.4% in the medical department [20]. Physicians in the Department of Oncology/Radiotherapy have to deal with the emotional turmoil of patients and their families after each new cancer case has been diagnosed. Doctors on trauma and emergency units also have to deal with critical patients and moribund patients. Anesthesiologist PGTs have high workload, multiple-night duties per week, and lack of personal time were a cause of their high burnout rate.

In this study (Table 5), burnout was higher among female PGTs than male PGTs but the value was not statistically significant. Isaac et al. in 2018 reported that higher burnout rate has been found among female medical students in Australia [21]. In studies in Karchi, Pakistan [22] and Riyadh, Saudi Arabia [23], the investigators also showed higher burnout rates among femalesthan males. In a Chinese [24] and Australian [25] studies, higher burnout rate has been found among males instead of females. During interview, females were found to have to prove in every aspect of their life in male-dominated society. We suggest that burnout rates are higher in the third-world countries as these countries are more patriarchal.

In this study, burnout was significantly highest among the 3rd year PGTs, followed by the 1st year PGTs and then the 2nd year PGTs (Table 5). Saini et al. in Delhi, India, found that the highest stress among the 1st year, followed by the 2nd year and then the 3rd year PGT [26]. During the interview, it was revealed that the 3rd year PGTs had pressure of examination, completion of thesis work, and the 1st year PGTs had higher work pressure, frequent night duties, and lack of vacational relief. Goel et al. found that an increase in disengagement domain or increased DP has been found as increases in the academic year [27]. Many studies reported that increased burnout rate and perceived stress have been found in progressive years of medical study [25, 28]. In our opinion, this phenomenon may be explained by boredom, the constant pressure of studies and work, and competition to crack various examinations and to make a mark in the practicing field.

In this study (Table 4), burnout was significantly highest among married PGTs, followed by single and lowest among PGTs who was in a relationship (p < 0.05). In this study (Table 3), we found that the presence of psychiatric illness was

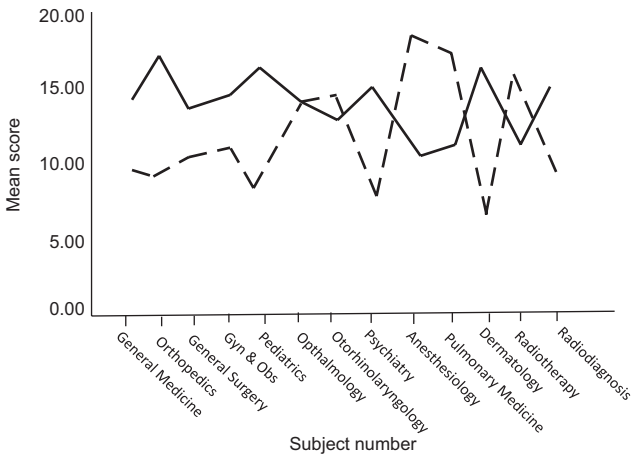

Figure 1. The relation of mean burnout score (Y axis) and subject number of postgraduate trainees (Y axis). The solid line denotes mean personal accomplishment total score, whereas the dotted line denotes mean burnout score. Highest mean burnout score was found among PGTs at Department of Anesthesia followed by those at Departments of Pulmonary Medicine, and Radiotherapy. Lowest mean score of burnout was seen among PGTs at Departments of Pediatrics, Psychiatry, and Dermatology. X axis denotes subjects and Y axis denotes mean value of personal accomplishment (mean PA total). Highest score of reduced personal accomplishment (PA) total was seen among PGTs of Department of Orthopedics, followed by those of among PGTs at Departments of Anesthesia. Lowest score of reduced PA total was found seen among PGTs of Departments of Anesthesia, and Radiotherapy followed by Department of Pulmonary Medicine.

Table 5. Comparison of burnout and reduced personal accomplishment with gender and psychiatric disease

Variables	Burnout (EE + DP)	*t* (df)	PA	*t* (df)
Gender				
Male (*n* = 84)	10.08 ± 5.80	− 1.66 (124)	13.82 ± 2.44	1.72 (124)
Female (*n* = 42)	11.93 ± 6.09		12.98 ± 2.90	
Psychiatric disease				
Presence (*n* = 21)	17.19 ± 6.69	− 6.28 (124)***	11.29 ± 2.39	4.67 (124)***
Absence (*n* = 105)	9.40 ± 4.85		13.99 ± 2.43	

***$p < 0.001$ with Chi-square test significantly different between two groups.

EE, emotional exhaustion; DP, depersonalization; PA, personal accomplishment

significantly more among the low-income group ($p < 0.05$). In previous findings, it was shown that financial constrain increase the stress [26].

In this study (Table 5), higher burnout rate was found to be significantly related to the presence of psychiatric comorbidity ($p < 0.001$). McManus et al. in 2002 also found similar relationship exists in the United Kingdom between stress and EE and they increased psychiatric illness such as anxiety and depression [10] These findings support the previous findings where Zurida and Zainal found that EE and DP are positively correlated with depression, anxiety, and burnout, but EE are positively correlated [4].

Study limitations

The readers are warned not to over-interpret the study results because this study has two major limitations:

- We recruited study participants at only one hospital at Burdwan Medical College. We did not recruit other study participants from the sampling process at different hospitals.
- Paraclinical, nonclinical disciplines were not included.
- There were various other factors modifying burnout and psychological morbidity, which were not included. The differential impact of the individual determinants was not assessed.

Study summary

In this study, 31.7% had high EE, 34.9% PGT had higher DP, 30.2% had high burnout rate. Totally, 31.7% PGT had low PA score ≤ 25 percentile. In this study, 83.3% had no psychiatric illness, 16.7% had psychiatric disorder. Among psychiatric disorders, 4% had harmful use of tobacco, 4% had mild depression, 1.6% hadpanic disorder, 4.8% had mixed anxiety depression, 1.6% hadobsessive and compulsive disorder, and 0.8% had harmful use of alcohol (diagnosed with *ICD*-10). The highest EE was noted among PGTs of the Department of Anesthesiology, followed by the Departments Pulmonary Medicine and then Radiotherapy. Highest score of PA was seen in PGTs of the Departments of Orthopedics, Dermatology, and Pediatrics. Burnout was the highest among 3rd-year PGTs, followed by 1st year, and then 2nd year. Burnout was significantly highest among married PGTs, followed by single and the PGTs who are being in a relationship. Burnout was positively correlated with EE and DP and negatively correlated with PA. Burnout was significantly related to the presence of psychiatric disorders.

Financial Support and Sponsorship

None.

Conflicts of Interest

There were no conflicts of interest in writing this article.

References

1. Gentile JP, Roman B: Medical student mental health services: Psychiatrists treating medical students. *Psychiatry* (Edgmont) 2009; 6: 38-45.
2. Taris TW, le Blanc PM, Schaufeli WB, et al.: Are there causal relationships between the dimensions of the Maslach burnout inventory? A review and two longitudinal tests. *Work Stress* 2005; 19: 238-55.
3. Maslach C, Schaufeli WB, Leiter MP: Job burnout. *Annu Rev Psychol* 2001; 52: 397-422.
4. Zuraida AS, Zainal NZ: Exploring burnout among Malaysian junior doctors using the abbreviated Maslach burnout inventory. *Malaysian J Psychiatry* 2015; 24: 23-32.
5. Dyrbye LN, Thomas MR, Shanafelt TD: Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med* 2006; 81: 354-73.
6. Barger LK, Ayas NT, Cade BE, et al.: Impact of extended-duration shifts

on medical errors, adverse events, and attentional failures. *PLoS Med* 2006; 3: e487.
7. Lockley SW, Cronin JW, Evans EE, et al.: Effect of reducing interns' weekly work hours on sleep and attentional failures. *N Engl J Med* 2004; 351: 1829-37.
8. Ramakrishna GS, Sankara Sarma P, Thankappan KR: Tobacco use among medical students in Orissa. *Natl Med J India* 2005; 18: 285-9.
9. Akvardar Y, Demiral Y, Ergor G, et al.: Substance use among medical students and physicians in a medical school in Turkey. *Soc Psychiatry Psychiatr Epidemiol* 2004; 39: 502-6.
10. McManus IC, Winder BC, Gordon D: The causal links between stress and burnout in a longitudinal study of UK doctors. *Lancet* 2002; 359: 2089-90.
11. Schaufeli W, Enzmann D: *The Burnout Companion to Study and Practice: A Critical Analysis*. Philadelphia, USA: Taylor and Francis, 1998.
12. Bore M, Kelly B, Nair B: Potential predictors of psychological distress and well-being in medical students: a cross-sectional pilot study. *Adv Med Educ Pract* 2016; 7: 125-35.
13. Cook AF, Arora VM, Rasinski KA, et al.: The prevalence of medical student mistreatment and its association with burnout. *Acad Med* 2014; 89: 749-54.
14. Cecil J, McHale C, Hart J, et al.: Behaviour and burnout in medical students. *Med Educ Online* 2014; 19: 25209.
15. Ishak W, Nikravesh R, Lederer S, et al.: Burnout in medical students: a systematic review. *Clin Teach* 2013; 10: 242-5.
16. Verdonk P, Räntzsch V, de Vries R, Houkes I. Show what you know and deal with stress yourself: a qualitative interview study of medical interns' perceptions of stress and gender. *BMC Med Educ* 2014; 14: 96.
17. Sreeramareddy CT, Shankar PR, Binu VS, et al.: Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of Nepal. *BMC Med Educ* 2007; 7: 26.
18. Olagunju AT, Ogundipe OA, Lasebikan VO, et al.: Pattern of anxiety psychopathology experienced among postgraduate medical trainees. *Bangladesh J Med Sci* 2016; 15: 25-32.
19. Aminazadeh N, Farrokhyar F, Naeeni A, et al.: Is Canadian surgical residency training stressful? *Can J Surg* 2012; 55: S145-51.
20. Raftopoulos V, Charalambous A, Talias M: The factors associated with the burnout syndrome and fatigue in Cypriot nurses: a census report. *BMC Public Health* 2012; 12: 457.
21. Isaac V, McLachlan CS, Walters L, et al.: Screening for burn-out in Australian medical students undertaking a rural clinical placement. *BMJ Open* 2019; 9: e029029.
22. Asghar AA, Faiq A, Shafique S, et al.: Prevalence and predictors of the burnout syndrome in medical students of Karachi, Pakistan. *Cureus* 2019; 11: e4879.
23. Altannir Y, Alnajjar W, Ahmad SO, et al.: Assessment of burnout in medical undergraduate students in Riyadh, Saudi Arabia. *BMC Med Educ* 2019; 19: 34.
24. Chunming WM, Harrison R, MacIntyre R, et al.: Burnout in medical students: a systematic review of experiences in Chinese medical schools. *BMC Med Educ* 2017; 17: 217.
25. Dyrbye L, Shanafelt T: A narrative review on burnout experienced by medical students and residents. *Med Educ* 2016; 50: 132-49.
26. Saini NK, Agrawal S, Bhasin SK, et al.: Prevalence of stress among resident doctors working in medical colleges of Delhi. *Indian J Public Health* 2010; 54: 219-23.
27. Goel AD, Akarte SV, Agrawal SP, et al.: Longitudinal assessment of depression, stress, and burnout in medical students. *J Neurosci Rural Pract* 2016; 7: 493-8.
28. Al-Shamli SA, Omrani SA, Mahroqui TA, et al.: Perceived stress and it's correlates among medical trainees in Oman: a single institution study. *Taiwan J Psychiatry* 2021; 35: 188-96.