

RESEARCH ARTICLE

PREVALENCE AND ASSOCIATED FACTORS OF BURNOUT AMONG RESIDENT DOCTORS IN TABUK, SAUDI ARABIA

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Abstract

Background: Burnout has become a problem that is increasing among doctors. Burnout syndrome consists of emotional exhaustion, depersonalization, and reduced personal accomplishment, which results from the accumulation of stress in a workplace.

Objectives: This study aimed to determine the prevalence and associated factors of burnout among resident doctors in Tabuk, Saudi Arabia.

Methods: A cross-sectional study was conducted among 230 resident doctors at King Salman Armed Forces Hospital in Northwestern Region in Tabuk City, Saudi Arabia between September 2020 and January 2021. Data were collected by using a self-administered questionnaire. The Maslach Burnout Inventory Human Services Survey for Medical Personnel (MBI-HSS (MP)) was used to measure burnout. Sources of stress were assessed by 20 items. Univariate and multivariate analysis were used to examine the factors associated with burnout.

Results: The overall prevalence of burnout was 89.1%. This study found that 32.2% of participants scored high on all the subscales. Burnout was associated with gender ($p=0.012$), chronic disease ($p=0.018$), level of training ($p<0.05$), dissatisfaction with work-life balance ($p<0.001$), work overload ($p<0.001$), and sources of stress in the workplace ($p<0.05$).

Conclusion: The prevalence of burnout among medical residents in Tabuk was high. Burnout was mainly associated with work-related sources of stress. There is a need for a comprehensive assessment of burnout and stress among medical residents at different levels and specialties. Thus, these findings may help diagnose such problems earlier and trace them to find better solutions, *ASEAN Journal of Psychiatry, Vol. 22(3): May 2021: 1-16.*

Keywords: Burnout, Resident Doctors, Source of Stress, Mental Health, Saudi Arabia

Introduction

Burnout has become a problem that is increasing among doctors. It is a syndrome consisting of Emotional Exhaustion (EE), Depersonalization (DP), and reduced Personal Accomplishment (PA), which results from the accumulation of stress in the workplace [1,2]. EE is a stress dimension of

burnout, which is a feeling of fatigue, exhaustion of emotional and physical resources, and a lack of energy.

DP occurs when a person attempts to put a distance between themselves and the recipient of the service or their work colleagues, which leads to negative and hostile attitudes, and makes them feel

indifferent toward their patients. Reduced personal achievement or job satisfaction was described as dissatisfaction with one's accomplishments, underestimating one's own value, and seeing themselves as insufficient [3]. Reported risk factors for burnout can be divided into categories such as work factors (long working hours, work overload which affects the quality of care, night shifts, and being on-call, and dealing with patients' illness and death), personal characteristics (gender, young, single, childless, and a work-life imbalance), and organizational factors (unfair assessment, working with uncooperative colleagues, lack of support, and rewards from superior) [1-3].

In medical training, residency is a critical and transitional stage, and is considered an intricate and exhausting period full of pressures, such as work overload and sleep deprivation, patient responsibility, fear of making mistakes, lack of time to study, having to prepare for exams, and inadequate support from supervisors [3]. Therefore, it is considered the most probable period for developing burnout syndrome due to its dualism of roles (learning and work) and intense pressure on the residents themselves [2]. The prevalence of burnout among resident doctors ranges from 27% to 81% [3-8]. The consequences of burnout syndrome affect the health of residents' doctors, leading them to suffer from problems such as hypertension, insomnia, myalgia, allergies, hair loss, headache, gastrointestinal disorders, difficulty concentrating, and more [3]. In addition, this may affect patient care and healthcare costs with disastrous consequences that must be prevented [9]. Thus, this study aimed to determine the prevalence of burnout and sources of stress among resident doctors in Tabuk, Saudi Arabia.

Methods

Study setting and sample

This cross-sectional study was conducted on 230 medical residents completing their training programs at all training levels in different specialties: Internal Medicine, Pediatrics, General Surgery, Obstetrics and Gynecology, Family Medicine, Preventive Medicine, Urology, Psychiatry, Orthopedic Surgery, and Anesthesia. Participants were recruited from King Salman Armed Forces Hospital in Northwestern

Region in Tabuk City, Saudi Arabia between September 2020 and January 2021.

Inclusion and exclusion criteria

The study included all medical residents who joined the Saudi board program for more than six months. Those who joined the Saudi board program for less than six months or refused to participate were excluded.

Study instruments

A three-part self-administered questionnaire was used.

The first part included sociodemographic characteristics, such as gender, age, marital status, number of children, health factors (height, weight, body mass index, history of chronic disease, smoking [10], and exercise [11]), and work-related questions (such as specialty, level of training, years of experience, number of on-call days/month, number of clinics/week, number of patients/clinic, number of operations/week, hours/week, satisfaction with work-life balance, ability to take annual occupational leave (30 days) at one time, job income, and specialty satisfaction).

The second part assessed burnout using the validated Maslach Burnout Inventory Human Services Survey for Medical Personnel (MBI-HSS (MP)), which is the most commonly used tool to determine burnout. The questionnaire consisted of 22 questions divided into three subscales. The EE subscale had nine items that evaluated complaints about feeling on edge and exhausted by work. The DP subscale had five items that evaluated impersonal responses and lack of empathy during professional activity. The PA subscale had eight items and evaluated feelings of competence and achievement of success at work. The questionnaire was scored on a 7-point Likert scale which ranged from 0 to 6 (0=never, 1=sometimes per year or less often, 2=once a month or less often, 3=several times a month, 4=once a week, 5=several times a week, and 6=daily). The scores of each subscale were summed and categorized as high, moderate, or low. Scores of 27 or more on EE, 13 or more on DP, and 31 or less on PA, was highly indicative of burnout [12]. All three subscales (EE, DP, and PA) showed high internal consistency with Cronbach's α coefficient values of 0.837, 0.869, and

0.881, respectively, and test-retest reliability was high ($p < 0.001$) [13].

The third part assessed sources of stress and used 20 items that were obtained from literature [14-16]. All items were headed by the following question: "To which extent do the following conditions cause stress to you." Each item was scored from 1 (causing no stress) to 4 (causing severe stress).

Ethical consideration

Ethical approval was obtained from the Taibah University Ethical Committee for Research. The objectives of the study were explained to the volunteer residents, and written informed consent was obtained from each participant. The collected data were confidential and would not be disclosed, except for fulfilling the study purpose. Participants could withdraw from the study at any time. The study was conducted in accordance with the code of ethics set by the Declaration of Helsinki and all its' amendments.

Statistical analysis

The Statistical Package for Social Sciences (version 22.0, IBM, Armonk, NY) was used for the analysis. The 22 items of the MBI were calculated to obtain the total scores of each subscale. Each subscale was

categorized as low, moderate, or high, according to the recommended cut-off points [17]. The normality test was performed for each subscale. T-tests and analysis of variance (ANOVA) were used to determine the association between burnout subscales and sociodemographic variables. Pearson's correlation coefficient was used to determine the association between burnout subscales and sources of stress [18]. Multiple linear regression analysis was employed by using the "Backward" technique to obtain the significant factors associated with each subscale of burnout. Multicollinearity was checked between the independent variables using the Variance Inflation Factor (VIF). The accepted level of significance was 5% ($p < 0.05$).

Results

Sociodemographic of the participants

Most participants were male (61.3%), aged ≤ 27 years (50.9%), single (67.4%), had normal weight (70.0%), and were from Tabuk (92.6%). About 15.2% had chronic diseases, and 42.1% were current smokers. Some participants were on medication for depression (2.6%), anxiety (3.5%), and sleeping disorders (7.0%). Most of them had sleeping hours/day from 6 to 8 hours (72.2%) (Table 1).

Table 1: Sociodemographic characteristics of the residents

	n	%
Age		
≤ 27	117	50.9
> 27	113	49.1
Gender		
Male	141	61.3
Female	89	38.7
Marital status		
Single/Engaged	155	67.4
Married/Widowed	75	32.6
Place of residence		
Tabuk	213	92.6
Others	17	7.4
BMI		
Underweight	3	1.3

Normal weight	161	70
Overweight	33	14.3
Obese	33	14.3
Chronic disease		
Yes	35	15.2
No	195	84.8
Asthma		
Yes	20	8.7
No	210	91.3
Diabetes Mellitus		
Yes	3	1.3
No	227	98.7
Hypertension		
Yes	3	1.3
No	227	98.7
Hypothyroidism		
Yes	5	2.2
No	225	97.8
Kidney Transplant		
Yes	2	0.9
No	228	99.1
Sickle Cell Anemia		
Yes	2	0.9
No	228	99.1
Depression Medication		
Yes	6	2.6
No	224	97.4
Anxiety Medication		
Yes	8	3.5
No	222	96.5
Sleep Disorder Medication		
Yes	16	7
No	214	93
Sleeping hours/day		
< 6 hours	49	21.3
6– 8 hours	166	72.2
> 8 hours	15	6.5
Current smoking status		
Daily	87	37.8
Less than daily	10	4.3
Not at all	133	57.8
Smoking Years		

≤ 10 years	82	84.5
> 10 years	15	15.5
Physical exercise		
Daily	40	17.4
Weekly	74	32.2
Never	116	50.4

Work-Related factors of the residents

Most of the participants were internal medicine residents (28.7%). The majority of residents from all specialties were in their first year of training (32.6%), most of them had ≤ two years of

experience (52.2%), and 77.4% worked for ≤ 8 h/day. Most of them had a monthly income of less than 20 thousand Saudi Rials (USD \$ 5332, € 4432) (93.0%). Majority were satisfied with their work-life balance (58.7%) (Table 2).

Table 2: Work-Related factors of the residents

	n	%
Specialty		
Internal Medicine	66	28.7
Pediatric	34	14.8
Surgical specialties (general, orthopedic, urology)	34	14.8
OB/GYN	14	6.1
Anesthesia	7	3
Family medicine	55	23.9
Preventive medicine	15	6.5
Psychiatry	5	2.2
Level of training		
Year 1	75	32.6
Year 2	54	23.5
Year 3	55	23.9
Year 4+ Year 5	46	20
Years of experience		
≤ 2 years	120	52.2
> 2 years	110	47.8
Working hours		
≤ 8 hours	178	77.4
> 8	52	22.6
Number of on call/month		
≤ 4	41	17.8
> 5	189	82.2
Number of clinic/week		
1 – 5	91	39.6
> 5	32	13.9
Not applicable	107	46.5

Number of patients/week		
≤ 30	104	45.2
> 30	24	10.4
Not applicable	102	44.3
Monthly income		
≤ 20000	214	93
> 20000	16	7
Satisfaction with work-life balance		
Yes	135	58.7
No	95	41.3
Ability to take annual occupational leave (30) days at one time		
Yes	159	69.1
No	71	30.9
If time went back, would you have chosen your specialty again?		
Yes	172	74.8
No	58	25.2

Prevalence of burnout among residents

About 62.2% had high EE, 48.7% had high DP, 69.6% had low PA. Additionally, 22.2% had

moderate EE, 38.7% showed moderate DP, and 17.0% showed moderate PA. While 15.7% had low EE, 12.6% had low DP, and 13.5% had high PA (Table 3).

Table 3: Prevalence of burnout among residents

	Low burnout n (%)	Moderate burnout n (%)	High burnout n (%)
EE	36 (15.7)	51 (22.2)	143 (62.2)
DP	29 (12.6)	89 (38.7)	112 (48.7)
PA	31 (13.5)	39 (17.0)	160 (69.6)

Factors associated with burnout in the univariate analysis

In univariate analysis of work-related factors, EE scores were significantly higher among those who were not satisfied with their work-life balance (32.5 ± 10.2) compared to those who were (25.0 ± 9.8), ($p < 0.001$). Moreover, it was higher among those who were not satisfied with their specialty (31.3 ± 11.0)

than among those who were (27.0 ± 10.2), ($p = 0.007$). Overall, there was an association between specialty and EE ($p < 0.001$); on post hoc analysis, pediatric residents had higher burnout compared to psychiatry, family medicine, and preventive medicine residents ($p < 0.05$). EE was positively and significantly correlated with all 20 sources of stress (r coefficient ranged from 0.182 to 0.458) ($p \leq 0.006$) (Table 4).

Table 4: Sources of stress presented by mean (SD)

Item	Mean (SD)
COVID-19 pandemic	2.4 (.92)
Too many tests/examinations	2.8 (.89)
Large amount of content to be learnt	2.9 (.95)
Time pressures and deadlines to meet	2.9 (.89)
Too many promotion requirements	2.6 (.97)
Work overload	2.7 (.98)
Unfair assessment from superior	2.4 (.97)
Fear of making mistakes	2.7 (.85)
Work demands affect my personal/home life	2.7 (.86)
Lack of time to review what has been learnt	2.6 (.92)
Having difficulty understanding the content	2.5 (.83)
Working with uncooperative colleagues	2.6 (.97)
Cannot participate in decision making	2.4 (.86)
Unable to make full use of my skills and ability	2.4 (.87)
My life is too centered on my work	2.3 (.97)
Lack of support from superior	2.4 (.94)
Lack of authority to carry out my job duties	2.4 (.87)
Working with incompetence colleagues	2.2 (.86)
Competition among colleagues	2.4 (.87)
Difficulty in maintaining relationship with superior	2.3 (.84)

DP was higher among those who were smokers for more than 10 years (14.2 ± 2.6) than among those

who were smokers for 10 years or less (11.4 ± 4.6), ($p=0.002$) (Table 5).

Table 5: Relationship between burnout and sociodemographic characteristics in the univariate analysis

Variables	Burnout					
	EE		DP		PA	
	Mean (SD)	P value	Mean (SD)	P value	Mean (SD)	P value
Age						
≤ 27	27.1 (9.9)		12.0 (4.6)		28.1 (7.0)	
> 27	29.1 (11.2)	0.116	12.0 (5.3)	0.971	28.7 (8.6)	0.545
Gender						
Male	27.6 (9.8)		11.8 (4.8)		29.2 (7.7)	
Female	28.8 (11.8)	0.411	12.4 (5.2)	0.392	27.1 (7.9)	0.044
Marital status						
Single/Engaged	28.3 (10.6)		12.1 (4.9)		28.9 (7.5)	

Married/Widowed	27.6 (10.6)	0.609	11.7 (5.1)	0.546	27.3 (8.3)	0.169
Place of residence						
Tabuk	28.1 (10.7)		12.1 (4.9)		28.3 (7.9)	
Others	27.3 (9.4)	0.759	11.0 (5.4)	0.399	29.2 (6.5)	0.655
BMI						
Underweight	24.0 (17.3)		10.6 (7.5)		24.0 (4.5)	
Normal weight	27.2 (10.1)		12.0 (4.9)		28.0 (8.2)	
Overweight	31.7 (11.7)		11.4 (5.3)		29.7 (7.2)	
Obese	29.3 (10.9)	0.124	12.8 (4.8)	0.687	29.2 (6.8)	0.462
Chronic disease						
Yes	27.7 (11.9)		13.0 (3.9)		25.4 (7.9)	
No	28.5 (10.3)	0.152	11.8 (5.1)	0.122	28.9 (7.7)	0.014
Depression Medication						
Yes	29.5 (10.1)		12.5 (.83)		26.6 (7.0)	
No	28.0 (10.6)	0.749	12.0 (5.0)	0.347	28.4 (7.8)	0.582
Anxiety Medication						
Yes	31.3 (11.3)		13.0 (4.2)		26.2 (6.0)	
No	28.0 (10.6)	0.379	12.0 (5.0)	0.585	28.4 (7.9)	0.429
Sleep Disorder Medication						
Yes	25.6 (13.1)		11.1 (3.7)		27.5 (9.3)	
No	28.3 (10.4)	0.345	12.1 (5.0)	0.446	28.4 (7.7)	0.654
Current smoking status						
Daily	29.0 (9.2)		11.9 (4.6)		29.8 (7.5)	
Less than daily	26.1 (5.2)		11.4 (2.4)		26.9 (5.8)	
Not at all	27.6 (11.7)	0.52	12.1 (5.3)	0.158	27.5 (8.0)	0.086
Smoking Years						
≤ 10 years	28.8 (9.5)		11.4 (4.6)		30.3 (7.5)	
> 10 years	28.4 (4.9)	0.89	14.2 (2.6)	0.002	25.4 (4.9)	0.019
Physical exercise						
Daily	25.5 (8.9)		12.2 (5.2)		29.4 (6.0)	
Weekly	27.2 (12.8)		11.3 (5.7)		28.1 (8.9)	
Never	29.6 (9.4)	0.073	12.4 (4.3)	0.361	28.2 (7.7)	0.684

Regarding work-related factors, the DP scores were significantly higher among those who were not satisfied with their work-life balance (13.8 ±4.2) compared to those who were (10.7 ±5.1), (p<0.001). Overall, there was an

association between specialty and DP (p<0.001); on post hoc analysis, pediatric residents had higher burnout compared to internal medicine, surgical, family medicine, and preventive medicine residents (p<0.05) (Table 6).

Table 6: Relationship between burnout and work-related factors in the univariate analysis

Variables	Burnout					
	EE		DP		PA	
	Mean (SD)	P value	Mean (SD)	P value	Mean (SD)	P value
Specialty						
Internal Medicine	28.9 (9.9)		12.3 (3.7)		27.3 (8.5)	
Pediatric	33.7 (8.2)		15.4 (3.7)		28.8 (5.8)	
Surgical specialties	29.3 (10.3)		10.2 (5.6)		34.5 (6.5)	
(general, orthopedic, urology)						
OB/GYN	32.7 (10.2)		15.9 (4.0)		23.7 (6.6)	
Anesthesia	30.1 (3.1)		11.5 (6.2)		30.8 (4.2)	
Family medicine	24.2 (11.5)		10.4 (5.1)		26.7 (7.6)	
Preventive medicine	22.7 (9.2)		10.4 (6.2)		26.6 (7.1)	
Psychiatry	13.0 (4.2)	<0.001	10.2 (2.1)	<0.001	30.6 (9.2)	<0.001
Level of training						
Year 1	28.2 (10.1)		12.5 (5.0)		29.0 (6.8)	
Year 2	26.9 (9.9)		10.9 (4.4)		26.7 (8.7)	
Year 3	26.6 (11.7)		12.5 (5.3)		26.7 (7.7)	
Year 4+Year 5	31.0 (10.4)	0.148	12.0 (5.1)	0.266	31.3 (7.6)	0.007
Years of experience						
≤ 2 years	28.1 (9.8)		12.26(4.7)		28.5 (7.4)	
> 2 years	28.0 (11.4)	0.971	11.8 (5.2)	0.507	28.3 (8.2)	0.861
Working hours						
≤ 8 hours	27.2 (9.4)		11.9 (4.6)		28.1 (7.4)	

> 8	31.1 (13.5)	0.055	12.5 (6.1)	0.527	29.3 (9.2)	0.382
Number of on call/month						
≤ 4	27.2 (10.0)		11.9 (4.2)		27.6 (8.6)	
>4	28.3 (10.7)	0.541	12.0 (5.1)	0.892	28.5 (7.6)	0.482
Number of clinic/week						
01-May	28.7 (12.4)		12.4 (5.7)		29.4 (7.2)	
>5	25.3 (10.6)		11.1 (4.6)		27.1 (7.4)	
Not applicable	28.3 (8.7)	0.274	11.9 (4.4)	0.486	27.9 (8.4)	0.263
Number of patients/week						
≤ 30	26.6 (12.5)		11.6 (5.5)		27.8 (8.3)	
> 30	30.7 (10.5)		12.8 (5.4)		29.7 (6.2)	
Not applicable	28.9 (8.1)	0.127	12.2 (4.2)	0.539	28.6 (7.7)	0.521
Monthly income						
≤ 20000	28.0 (10.2)		11.9 (4.7)		27.9 (7.8)	
> 20000	29.1 (15.1)	0.782	13.4 (7.6)	0.455	34.1 (5.1)	<0.001
Satisfaction with work-life balance						
Yes	25.0 (9.8)		10.7 (5.1)		29.1 (8.3)	
No	32.5 (10.2)	<0.001	13.8 (4.2)	<0.001	27.3 (7.0)	0.094
Ability to take annual occupational leave (30) days at one time						
Yes	27.7 (9.8)		11.9 (4.7)		28.4 (7.7)	
No	28.9 (12.2)	0.455	12.3 (5.5)	0.639	28.4 (8.2)	0.99
If time went back, would you have chosen your specialty						

again?						
Yes	27.0 (10.2)		11.8 (5.1)		28.6 (8.1)	
No	31.3 (11.0)	0.007	12.6 (4.5)	0.301	27.6 (7.0)	0.365

DP was correlated positively and significantly with 16 out of 20 sources of stress (r coefficient ranged from 0.152 to 0.366, $p < 0.003$) (Table 7).

Table 7: Relationship between burnout and sources of stress

Item	EE		DP		PA	
	R Coefficient	P value	R Coefficient	P value	R Coefficient	P value
COVID-19 pandemic	0.182	0.006	0.108	0.101	-0.043	0.52
Too many tests/examinations	0.33	<0.001	0.192	0.003	-0.052	0.43
Large amount of content to be learnt	0.286	<0.001	0.085	0.198	-0.101	0.13
Time pressures and deadlines to meet	0.308	<0.001	0.197	0.003	-0.013	0.85
Too many promotion requirements	0.249	<0.001	0.197	0.002	-0.015	0.83
Work overload	0.458	<0.001	0.197	0.002	0.11	0.1
Unfair assessment from superior	0.301	<0.001	0.197	0.006	0.07	0.29
Fear of making mistakes	0.229	<0.001	0.197	0.174	-0.061	0.36
Work demands affect my personal/home life	0.397	<0.001	0.197	<0.001	-0.074	0.27
Lack of time to review what has been learnt	0.301	<0.001	0.197	0.096	0.005	0.94
Having difficulty understanding the content	0.376	<0.001	0.197	<0.001	0.004	0.95
Working with uncooperative colleagues	0.333	<0.001	0.197	0.021	-0.003	0.96
Cannot participate in decision making	0.352	<0.001	0.197	<0.001	-0.108	0.1
Unable to make full use of my skills and ability	0.26	<0.001	0.197	<0.001	-0.081	0.22
My life is too centered on my work	0.344	<0.001	0.197	<0.001	-0.119	0.07
Lack of support from superior	0.407	<0.001	0.197	<0.001	-0.005	0.94
Lack of authority to carry out my job duties	0.419	<0.001	0.197	<0.001	-0.026	0.69
Working with incompetence colleagues	0.251	<0.001	0.197	<0.001	-0.112	0.09

Competition among colleagues	0.3	<0.001	0.197	<0.001	-0.085	0.2
Difficulty in maintaining relationship with superior	0.367	<0.001	0.197	<0.001	-0.074	0.27

PA was significantly lower among females (27.1±7.9) compared to males (29.2 ±7.7) (p=0.044), and among those with chronic disease (25.4± 7.9) compared to those without chronic disease (28.9±7.7) (p=0.014).

Regarding work-related factors, PA was significantly lower among those who had an income of ≤ 20000 SAR (27.9 ± 7.8) compared to those with an income of >20000 (34.1± 5.1), (p<0.001). Overall, there was an association between specialty and PA (p<0.001); on post hoc analysis, surgical residents had higher PA compared to internal medicine, pediatric, obstetrics and gynecology, family medicine, and preventive medicine residents (p<0.05). In addition, there was an association between PA and level of training (p=0.007); on post hoc analysis, year 4+ year 5 had higher PA compared to year 2 and year 3 (p<0.05).

Factors associated with burnout in the multivariate analysis

In the multivariate analysis, significant predictors of EE were dissatisfaction with work-life balance (p<0.001), work overload (p<0.001), working with uncooperative colleagues (p=0.003), “my life was too centered on my work” (p=0.002), and working with incompetent colleagues (p=0.037). Significant predictors of DP were dissatisfaction with work-life balance (p<0.001), inability to participate in decision making (p=0.003), and competition among colleagues (p=0.001). Low PA was significantly predicted by female sex (p=0.012), chronic disease (p=0.018), and level of training; year 1, year 2, and year 3 had lower PA (p=0.036), (p <0.001), (p=0.001), respectively, compared to year 4+ year 5 (Table 8).

Table 8: Factors associated with burnout in multivariate analysis

	B	SE	Beta	P value	95.0% CI	VIF
Emotional exhaustion						
Are you satisfied with your work-life balance?	6.093	1.27	0.28	<0.001	3.58 _ 8.60	1.193
Work overload	3.506	0.67	0.33	<0.001	2.17 _ 4.83	1.341
Working with uncooperative colleagues	2.214	0.73	0.2	0.003	0.76 _ 3.66	1.543
My life is too centered on my work	2.114	0.68	0.19	0.002	0.76 _ 3.46	1.353
Working with incompetence colleagues	1.819	0.86	0.15	0.037	0.11 _ 3.52	1.7
Depersonalization						
Are you satisfied with your work-life balance?	2.424	0.61	0.24	<0.001	1.22 _ 3.62	1.053
Cannot participate in decision-making	1.189	0.4	0.2	0.003	0.39 _ 1.97	1.379

Competition among colleagues	1.265	0.38	0.22	0.001	0.50 _ 2.02	1.321
Personal accomplishment						
Gender						
Female	-2.64	1.04	-0.2	0.012	-4.69 _ -0.58	1.051
Male (Reference)						
Level of training						
Year 1	-3.04	1.43	-0.2	0.036	-5.87 _ -0.20	1.849
Year 2	-5.45	1.53	-0.3	<0.001	-8.47 _ -2.43	1.716
Year 3	-4.99	1.52	-0.3	0.001	-7.98 _ -1.99	1.709
Year 4+Year 5 (Reference)						
Residents having chronic diseases	-3.31	1.38	-0.2	0.018	-6.04 _ -0.57	1.011

Discussion

Burnout is a work-related phenomenon that affects the health of medical residents both physically and mentally. However, this problem has not been studied in depth locally for medical residents. To our knowledge, this is the first study to identify the prevalence of burnout among medical residents in Tabuk. The primary aim of this study was to assess the prevalence of burnout and its associated factors among resident doctors. In this study, the overall prevalence of burnout was 89.1%. This study found that 32.2% of participants scored high on all subscales of burnout. High EE and high DP were found in 62.2% and 48.7% of participants, respectively, while PA was low in 69.6%. Based on previous studies, the prevalence of burnout among Saudi medical residents ranged from 70% to 81% [7,8,17]. In these studies, 51% to 71% of participants showed high DP, 31.5% to 67% exhibited low personal achievement, and 12.5% to 62% had high EE [17]. According to international literature, the prevalence of burnout among medical residents ranges from 27% to 75%, depending on the specialty [17]. In the UAE, burnout was prevalent in more than 70% of medical residents [6]. In Lebanon, 27% of residents met the criteria for burnout [4]. In Brazil, the prevalence of burnout among residents was 27.9% [3]. Among US resident physicians, the prevalence of burnout symptoms was 48.8% [5].

It is unclear why Saudi medical residents might experience a higher degree of burnout. Some authors hypothesize that the social and cultural situation in the kingdom may influence burnout. Due to the lack of health education in the general public, Saudi patients expect more from doctors. There is also a cultural tendency among Saudi patients and their relatives to seek advice and direct their attention more to senior doctors and ignore junior doctors in the process. This may lead to a feeling of decreased merit and, thus, may increase burnout [7].

Regarding factors associated with burnout, this study found that EE was associated with work-life balance dissatisfaction, specialty, and sources of stress such as work overload, working with uncooperative and incompetent colleagues, and life centered on work. A previous study in Malaysia found a significant association between EE and sources of stress such as long working hours, time pressures and difficulty in meeting deadlines, lack of incentives and promotions, feeling underpaid, work overload, on-call, work demands affecting personal and home life, inadequate skills for dealing with more difficult aspects of work matters, lack of support and unfair assessment from supervisors, working outside one's competence, fear of infection, feeling unsafe during work, feeling

insecure in this job, and difficulty in maintaining a relationship with a supervisor [16].

In this study, DP was associated with smoking years, work-life balance dissatisfaction, specialty, inability to participate in decision making, and competition among colleagues. A previous study in Brazil found an association between DP and surgical specialties and stressful events in the previous six months [3]. In this study, low PA was associated with gender, chronic disease, monthly income, specialty, and training level. Previous studies have found an association between burnout and age, gender, marital status, residence, monthly income, and work-life dissatisfaction [18]. In contrast, other studies did not find an association between burnout and sociodemographic factors [19].

In our study, the following significant associations were found: (i) Pediatric residents were associated with a higher prevalence of DP and EE, and (ii) obstetrics and gynecology residents were associated with a higher prevalence of DP. These findings are consistent with that of a previous study in the US that found higher burnout in pediatric residents. Some previous studies are inconsistent with our results; one study reported that emergency, internal medicine, and obstetrics and gynecology residents had the highest burnout rate, but pediatric and general surgery residents had the lowest rate [7]. Another study in Brazil found an association between burnout and surgical specialty residents [3]. One study in Malaysia found an association between EE and some specialties, such as obstetrics and gynecology and surgical departments [16].

In our study, work-life balance dissatisfaction was associated with a higher prevalence of high DP and EE among resident doctors. This was similar to other international research findings that showed that physicians were more likely to experience increased burnout and lower work-life balance [20, 21].

In our study, the sources of stress associated with burnout included work overload, conflict with colleagues, and inability to participate in decision making. A previous systematic review found that work overload, lack of control, insufficient reward, breakdown of community, lack of fairness, and conflicting values between job requirements and

personal values increased the risk of burnout [22]. According to Maslach, EE seemed to emerge from work overload [23]. Generally, there is an excellent agreement between studies that burnout is associated with sources of stress in the workplace [24].

Limitations

One of the main limitations of our study is the cross-sectional design which limits our research in that we can predict correlations from our data, but not causality.

Conclusion

The prevalence of burnout among medical residents in Tabuk was 89.1%. Burnout was mainly associated with work-related sources of stress.

Recommendations

The high rate of burnout among medical residents in Saudi Arabia is alarming. There is a need for a comprehensive assessment of burnout and stress in medical residents at different levels and specialties, which may help diagnose such problems earlier and trace them to better solutions. Burnout is a problem in the system, not an individual disease, and it must be addressed with systematic solutions. Researchers at Pennsylvania State University have proposed an approach that relies on modifying Maslow's hierarchy of needs.

Their strategy begins with a focus on individual basic needs for physical and mental health and safety, followed by higher order needs such as respect, appreciation, and communication, and practical changes in the way clinicians deal with electronic systems, including electronic medical records [25]. As the kingdom moves towards Vision 2030, it established a national health transformation program to achieve the quadrable aim of the Institution of Health Improvement (IHI) (improving patient experience, better health outcomes, lowering costs, and improving clinician experience) [26]. It is imperative to reconfigure the medical training approach in cooperation with the Saudi Commission for Health Specialties. To guarantee personal well-being, which is critical for the successful education of the next generation of physicians, a priority focus on resident physicians'

well-being should be placed to provide optimal care for others.

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References

1. Patel RS, Bachu R, Adikey A, Malik M, Shah M. Factors related to physician burnout and its consequences: A review. *Behav Sci.* 2018; 8(11): 98.
 2. Tjink JK, Vergouwen AC, Smulders YM. Emotional exhaustion and burnout among medical professors; a nationwide survey. *BMC Med Educ.* 2014; 14: 183.
 3. Gouveia PADC, Ribeiro MHC, Aschoff CAM, Gomes DP, Silva NAFD, Cavalcanti HAF. Factors associated with burnout syndrome in medical residents of a university hospital. *Rev Assoc Med Bras.* 2017; 63(6): 504-511.
 4. Talih F, Warakian R, Ajaltouni J, Shehab AA, Tamim H. Correlates of depression and burnout among residents in a Lebanese academic medical center: a cross-sectional study. *Acad Psychiatry.* 2016; 40: 38-45.
 5. Dyrbye LN, Burke SE, Hardeman RR, Herrin J, Wittlin NM, Yeazel M, et al. Association of clinical specialty with symptoms of burnout and career choice regret among US resident physicians. *JAMA.* 2018; 320(11): 1114-1130.
 6. 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.
 7. Abdulaziz S, Baharoon S, Al Sayyari A. Medical residents' burnout and its impact on quality of care. *Clin Teach.* 2009; 6(4): 218-224.
 8. Hameed TK, Masuadi E, Al Asmary NA, Al-Anzi FG, Al Dubayee MS. A study of resident duty hours and burnout in a sample of Saudi residents. *BMC Med Educ.* 2018; 18: 180.
 9. Pasqualucci PL, Damaso LL, Danila AH, Fatori D, Neto FL, Koch VH. Prevalence and correlates of depression, anxiety, and stress in medical residents of a Brazilian academic health system. *BMC Med Educ.* 2019; 19: 1-5.
 10. Centers for Disease Control. Tobacco questions for surveys: a subset of key questions from the Global Adult Tobacco Survey (GATS): global tobacco surveillance system. World Health Organization. 2011; 41.
 11. Amireault S & Godin G. The Godin-Shephard leisure-time physical activity questionnaire: validity evidence supporting its use for classifying healthy adults into active and insufficiently active categories. *Perceptual and motor skills.* 2015; 120: 604-622.
 12. Maslach C, Jackson SE, Leiter MP, Schaufeli WB & Schwab RL. *Maslach burnout inventory.* Palo Alto, CA: Consulting psychologists press. 1986.
 13. Wickramasinghe ND, Dissanayake DS & Abeywardena GS. Validity and reliability of the Maslach Burnout Inventory-student survey in Sri Lanka. *BMC Psychol.* 2018; 6: 52.
 14. Al-Dubai SA, Rampal KG. Prevalence and associated factors of burnout among doctors in Yemen. *J Occup Health.* 2010; 52: 58-65.
 15. Aldubai SA, Aljohani AM, Alghamdi AG, Alghamdi KS, Ganasegeran K, Yenbaawi AM. Prevalence and associated factors of burnout among family medicine residents in Al Madina, Saudi Arabia. *J Family Med Prim Care.* 2019; 8(2): 657-662.
 16. Al-Dubai SA, Ganasegeran K, Perianayagam W, Rampal KG. Emotional burnout, perceived sources of job stress, professional fulfillment, and engagement among medical residents in Malaysia. *The Scientific World Journal.* 2013; 2013: 137620.
 17. IsHak WW, Lederer S, Mandili C, Nikravesh R, Seligman L, Vasa M, et al. Burnout during residency training: a literature review. *J Grad Med Educ.* 2009; 1(2): 236-242.
 18. Fernando BMS, Samaranayake DL. Burnout among postgraduate doctors in Colombo: prevalence, associated factors and association with self-reported patient care. *BMC Med Educ.* 2019; 19: 373.
 19. Alyamani A, Alyamani L, Altheneyan F, Aldhali S, Albaker K, Alshaalan A, et al. Prevalence of burnout among residents at king Abdulaziz Medical City in Riyadh, Saudi Arabia. *International Journal of Medical Research & Health Sciences.* 2018; 7(12): 37-40.
- Hussenoeder FS, Bodendieck E, Jung F, Conrad I &

- Riedel-Heller SG. Comparing burnout and work-life balance among specialists in internal medicine: the role of inpatient vs. outpatient workplace. *J Occup Med Toxicol.* 2021; 16: 5.
20. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clinic Proceeding.* 2015; 90(12): 1600–1613.
21. Rothenberger DA. Physician burnout and well-being: a systematic review and framework for action. *Dis Colon Rectum* 2017; 60(6): 567-576.
22. Yates SW. Physician stress and burnout. *Am J Med.* 2020; 133(2): 160-164.
23. Shahin MA, Al-Dubai SAR, Abdoh DS, Alahmadi AS, Ali AK & Hifnawy T. Burnout among nurses working in the primary health care centers in Saudi Arabia, a multicenter study. *AIMS Public Health.* 2020; 7(4): 844-853.
24. Shapiro DE, Duquette C, Abbott LM, Babineau T, Pearl A & Haidet P. Beyond burnout: a physician wellness hierarchy designed to prioritize interventions at the systems level. *Am J Med.* 2019; 132(5): 556-563.
25. Institute for Healthcare Improvement. The IHI Triple Aim. 2020.

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