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Research Article

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Burnout Among Intensive Care Units Physicians and Nurses at Tertiary Care Hospitals in Riyadh, Saudi Arabia

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ABSTRACT

Introduction: Medical staff, particularly those working in the intensive care unit (ICU), are among the populations most vulnerable to stress and burnout. The objective of this study was to estimate and compare the prevalence of burnout among ICU physicians and nurses at tertiary care hospitals in Riyadh, Saudi Arabia.

Methods: In this cross-sectional study, 159 ICU physicians and nurses from four tertiary hospitals in Riyadh, Saudi Arabia were included in the study. The study was conducted between July 2021 and March 2022. The participants were asked to complete a self-administered questionnaire consisting of two sections. The first section collected demographic data, while the second section focused on assessing burnout using Maslach Burnout Inventory™ (MBI) for Medical Personnel.

Results: The overall prevalence of burnout among all participants was 60%. The mean score for emotional exhaustion (EE) was 27.93 ± 12.14, for low personal accomplishment (PA), it was 29.62 ± 9.51, and for depersonalization (DP), it was 11.46 ± 6.71. Factors identified to be associated with burnout include age, gender, job rank and type, number of shifts per week, number of hours per shift and smoking status.

Conclusion: The findings of this study highlight the high risk of stress and burnout among ICU staff, characterized by exhaustion, depersonalization, and a lack of accomplishment. It is crucial for critical care societies and policymakers to take proactive measures in developing policies aimed at addressing the underlying causes of stress and reducing burnout.

Keywords: Stress, Healthcare Professionals, Occupational Health, Lifestyle, Safety

Introduction

Stress occurs when a situation demands threaten to exceed the resources of the individual to cope [1]. Long duration of stress can lead to disastrous changes in the body like depression, heart disease, cancer, stroke, ulcers, back pain, headaches, raised blood pressure, indigestion, and various other problems [2]. This stress when persisting for longer duration may result in burnout [3]. Burnout is defined by International Classification of Diseases (ICD-11) as a syndrome resulting from chronic workplace stress, characterized by a loss of enthusiasm for work (emotional exhaustion), feelings of cynicism (depersonalization) and reduced professional efficacy [4].

One of the main populations at higher risk of stress are medical staff, especially the intensive care unit (ICU) staff. Working as an ICU healthcare practitioner is considered a psychological stress because it requires dealing with high risk, sick and uncooperative

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patients which leads to mental stress. This eventually may lead to decreasing personal wellbeing, increasing absenteeism, more mistakes and ultimately compromised patient care [3,5,6].

Burnout and level of stress among ICU staff have been described in several studies. Burnout rates among physicians and work-life balance in the United States worsened between 2011 and 2014, and more than half of physicians experience professional burnout at the study time [7]. In a study done in 16 Asian countries with a total of 992 ICU physicians and 3100 ICU nurses, both physicians and nurses had high levels of burnout (50.3% versus 52%) [8].

An Indian study assessed level of stress among ICU physicians and nurses using Depression Anxiety Stress Scale (DASS), and reported 36.58.4% and 68.29% rates of stress among physicians and nurses respectively [2].

Nearly half of pediatric critical care physicians in US found to have high burnout score, scored high burnout in at least one of the three subscales of the Maslach Burnout Inventory and 21% reported severe burnout [9]. Similar rate was found in another American study done in California [10]. Among ICU physicians, severe burnout was found to be 15% in Turkey and 25% in Brazil [11,12].

High level of burnout was also reported in some Arab countries. In Egypt, 87.8% of nurses were found positive for burnout syndrome [13].

Locally, majority of ICU nurses found to have moderate, to sever level of burnout [14-16].

Prevalence reached very high rates during Covid19 pandemic, for example, in China, in a study done in 2020, the rate of burnout reached 71.3% and 68.3% among ICU doctors and nurses respectively [17].

Several contributing factors to burnout were found like being a female gender, alternate-day shift, long duration of duties and incidence of end-of-life care [11,18].

This study aimed to estimate and compare the prevalence of burnout among ICU physicians and nurses at tertiary care hospitals in Riyadh, Saudi Arabia, and to associate different demographic characteristics with level of burnout.

Materials and Methods

This cross-sectional study was conducted on ICU physicians and nurses at four tertiary hospitals in Riyadh, Saudi Arabia: King Abdulaziz Medical City (KAMC), Prince Sultan Military Medical City (PSMMC), King Fahad Medical City (KFMC), and King Khalid Medical City (KKMC), in the period from July 2021 to March 2022.

The sample size was calculated based on El-Sherbiny et al study that found 11.4% prevalence of burnout [19]. Using Raosoft.com online calculator, the sample size was estimated to be 151, with 95% confidence interval and 5% margin of error. Convenience non-probability sampling was used to select participants. Participants were approached personally and asked to fill a self-administered questionnaire which contain two sections, section one for demographic data and section two for burnout assessment. Maslach Burnout Inventory™ (MBI) for Medical Personnel was used, with permission, to magnify the level of burnout. MBI has three subscales: emotional exhaustion (EE), personal accomplishment (PA) and depersonalization (DP). Each subscale is measured on a 6-point Likert scale of 0 as never and 6 as every day. The EE sub-scales had a total of 9 items, with a total score of 54, PA sub-scale has 8 items with a total score of 48, whereas DP has 5 items with a total score of 30. The internal reliability of the MBI tool in our population was good, and Cronbach alpha (α) was 0.85 for all the 22-items. The Cronbach alpha (α) for sub-scales EE, PA, and DP was 0.89, 0.84, and 0.75, respectively.

Statistical Analysis

The initial data was collected using Microsoft Excel and later transferred to Statistical Package for Social Sciences (SPSS) version 22 for analysis. The initial total scores were computed for all the subscales, and descriptive statistics was reported for all the personal profile related variables as numbers and percentages. The mean±SD along with median interquartile range were reported for the three sub-scales. The total score of EE, DP and, PA was categorized into low, moderate and, high groups as per the cut-off scores recommended by previous publication using MBI tool. The high score on EE and/or DP was labeled as having burnout. The association of profile of the participant with the presence of burnout was assessed using chi square/fishers exact test as appropriate. Independent sample T-test was used to determine the association between total EE, PA, and DP scores among nurses and physicians. For level of burnout among nurses vs physicians, ANOVA test was applied. All the tests were considered significant at the p-value <0.05.

Results

Total of 159 participants were included in the study. Table 1 shows their sociodemographic profiles. Forty-three per cent were at the age group between 30 - 39 years, 91 (57%) were males, 73 (46%) were nurses, while 86 (54%) were physicians. Majority of physicians (56%) were training residents, while the highest proportion of nurses (43%) were specialists, and majority (57%) were working at PSMMC. As for the type of job, 153 (96%) had full time job, and the highest rate of participants (41%) had been working for less than 5 years. Thirty seven percent of participants reported having 5 shifts per week, 45 (28%) reported having 4 shifts per week. The highest rate of participants (45%) reported having an 8-hour duty, while 60 (38%) reported having a 12-hour duty. The majority of participants were non-smokers.

Table 1: Participants profiles (n=159)

Variables	Category	N	N
Sex	Male	91	57%
	Female	68	43%
Age group	20-29 years	38	24%
	30-39 years	69	43%
	40-49 years	43	27%
	50 and above	9	6%
Where do you work?	KAMC	35	22%
	KFMC	18	11%
	KKMC	15	9%

Where do you work?	PSMMC	91	57%
Profession	Nurse	73	46%
	Physician	86	54%
Physicians rank(n=86)	Training resident	48	56%
	Service resident	10	12%
	Registrar	10	12%
	Fellow	5	15%
	Consultant	13	8%
Nurses rank(n=73)	Technician	24	33%
	Specialist	31	43%
	Senior Specialist	15	21%
	Consultant	3	4%
Type of job	Part time	6	4%
	full time	153	96%
Since how long you have been practicing as an ICU staff?	< 5 years	65	41%
	6 to 9 yr.	32	20%
	10 to 14 yrs.	41	26%
	15 to19 yrs.	14	9%
	>20 yrs.	6	4%
How many shifts per week you work?	3	9	6%
	4	45	28%
	5	59	37%
	6	22	14%
	7	24	15%
How many hours is your shift?	6 Hours	8	5%
	8 hours	71	45%
	12 hours	60	38%
	16 Hours	13	8%
	>16 hours	7	4%
Other official duties beside ICU clinical work?	No	105	66%
	Yes	54	34%
If you put yes, mention what duties are?	Academic	5	7%
	Administrative	19	28%
	Clinical	15	22%
	More than one task	16	24%
	Research/other	13	19%
Smoking status	Never	99	62%
	Ex-Smoker	21	13%

The prevalence of burnout among all participants was 60%. The mean score of emotional exhaustion was 27.93 ± 12.14, 29.62 ± 9.51 for low personal accomplishment, and 11.46 ± 6.71 for depersonalization. (Table 2)

Table 2: Prevalence and summary of Burnout subscales (n=159)

Burn out	N	%
Absent	63	40
Present	96	60
Subscale	Numerical measure	Value
EE	Mean	27.93
	Standard Deviation	12.14
	Median	27
	Percentile 25	21
	Percentile 75	36
PA	Mean	29.62
	Standard Deviation	9.51
	Median	30
	Percentile 25	24
	Percentile 75	36
DP	Mean	11.46
	Standard Deviation	6.71
	Median	12
DP	Percentile 25	6
	Percentile 75	16

Figure 1 demonstrates the severity of burnout subscales. Fifty-four percent of participants had high level of emotional exhaustion, 67% had high level of low personal accomplishment, and 60% had high level of depersonalization.

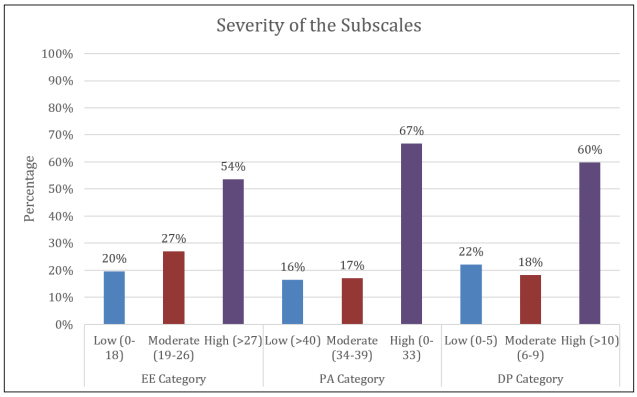

Figure 1: Severity of burnout subscales

Table 3 displays burnout levels across participant's profile. A significant difference of burnout was observed among physicians (p = 0.02), where highest rate of burnout was found in fellow physicians (100%), followed by senior registrars (80%) and then by training residents (73%), while consultants and service residents had notably lower rates, with 39% and 40% respectively. Likewise, a significant difference of burnout was observed among nurses (p = 0.02), where the highest rate was found in consultant nurses (100%), followed by senior specialists (80%) and then by specialists (52%), while technician had notably lower rates (38%). Other sociodemographic factors had no significant association with the presence of burnout in general.

Table 3: Burnout prevalence among participants (n=159)

Variables	Category	Burnout				
		Absent		%		
		N	percentage	N	percentage	p-value
Sex	Male	32	35%	59	65%	0.18
	Female	31	46%	37	54%	
Age group	20-29 years	17	45%	21	55%	0.19
	30-39 years	27	39%	42	61%	
	40-49 years	13	30%	30	70%	
	50 and above	6	67%	3	33%	
Where do you work?	KAMC	16	46%	19	54%	0.14
	KFMC	11	61%	7	39%	
	KKMC	5	33%	10	67%	
	PSMMC	31	34%	60	66%	
Profession	Nurse	33	45%	40	55%	0.19
	Physician	30	35%	56	65%	
Physicians rank(n=86)	Training resident	13	27%	35	73%	**0.02***
	Service resident	6	60%	4	40%	
	Registrar	2	20%	8	80%	
	Fellow	0	0%	5	100%	
	Consultant	8	62%	5	39%	
Nurses rank(n=73)	Technician	15	63%	9	38%	**0.02***
	Specialist	15	48%	16	52%	
	Senior Specialist	3	20%	12	80%	
	Consultant	0	0%	3	100%	
Type of job	Part time	0	0%	6	100%	0.08
	full time	63	41%	90	59%	
Since how long you have been practicing as an ICU staff?	< 5 years	25	39%	40	62%	0.69
	6 to 9 yrs.	11	34%	21	66%	
	10 to 14 yrs.	16	39%	25	61%	
	15 to19 yrs.	6	43%	8	57%	
	>20 yrs.	4	67%	2	33%	
How many shifts per week you work?	3	3	33%	6	67%	0.11
	4	22	49%	23	51%	
	5	27	46%	32	54%	
	6	6	27%	16	73%	
	7	5	21%	19	79%	
How many hours is your shift?	6 Hours	4	50%	4	50%	0.10
	8 hours	32	45%	39	55%	
	12 hours	24	40%	36	60%	
	16 Hours	1	8%	12	92%	
	>16 hours	2	29%	5	71%	
Are you doing other official duties beside your ICU clinical work?	No	39	37%	66	63%	0.37
	Yes	24	44%	30	56%	
If you put yes, mention what duties are?	Academic	3	60%	2	40%	0.39
	Administrative	6	32%	13	68%	
	Clinical	8	53%	7	47%	
	More than one task	9	56%	7	44%	
If you put yes, mention what duties are?	Research/other	4	31%	9	69%	0.39
Smoking status	Never	45	46%	54	55%	0.14
	Ex-Smoker	7	33%	14	67%	
	Current Smoker	11	28%	28	72%	

* The Chi-square statistic/fishers exact test applied as applicable, is significant at the .05 level.

Table 4 shows the association between the sociodemographic factors and the score of each burnout subscale. As for the factor's association with emotional exhaustion score, physician rank was significantly associated with emotional exhaustion (p = 0.03), with service residents having the highest EE score, while fellow physicians had the lowest EE score.

Table 4: Demographics vs. burnout subscales (n-159)

Variables	Category	EE		p-value	PA		p-value	DP		p-value
		Mean	SD		Mean	SD		Mean	SD	
Sex	Male	28.41	13.12	0.56	28	10.1	**0.01**	12.15	6.64	0.13
	Female	27.29	10.74		31.79	8.24		10.53	6.74	
Age group	20-29 years	27.08	11.67	0.24	26.16	9.51	0.07	12.45	5.82	0.06
	30-39 years	29.23	13.62		31.03	10.12		10.55	7.38	
	40-49 years	28.12	9.5		30.4	6.92		12.88	6.04	
	50 and above	20.67	12.27		29.78	13.07		7.44	6.04	
3. Where do you work?	KAMC	27.94	13.83	0.58	28.89	10.34	0.11	9.91	6.41	0.23
	KFMC	24.44	10.52		26.67	10.95		10.28	6.5	
	KKMC	29.87	13.74		34.53	6.83		10.8	4.95	
	PSMMC	28.3	11.53		29.68	9.09		12.4	7.04	
Profession	Nurse	26.62	10.06	0.19	30.62	8.34	0.22	10.67	6.6	0.17
	Physician	29.05	13.62		28.78	10.38		12.13	6.76	
Physicians rank(n=86)	Training resident	30.94	12.87	**0.03**	28.77	9.24	0.96	13.71	6.85	**0.02**
	Service resident	20.5	16.07		27.5	15.01		8.7	7.53	
	Registrar	31.7	10.63		30.7	8.99		11.1	4.93	
	Fellow	40	7.91		30	7.97		14.8	2.28	
	Consultant	23.62	14.03		28.15	13.13		8	6.16	
Nurses rank(n=73)	Technician	25.29	12.88	0.86	32.46	10.34	**0.01**	7.96	5.5	**<0.001**
	Specialist	27.39	9.67		32.29	6.59		10	6.38	
	Senior Specialist	27.6	6.1		25.67	6.08		14.67	5.95	
	Consultant	26	6.08		22.33	1.53		20.33	4.04	
Type of job	Part time	31.17	6.71	0.50	28.17	4.67	0.70	17.67	4.55	**0.02**
	full time	27.8	12.3		29.68	9.66		11.22	6.67	
Since how long you have been practicing as an ICU staff?	< 5 years	28.91	12.88	0.46	28.55	9.96	0.66	12.42	6.9	0.12
	6 to 9 yr	30.25	13.95		31.06	9.74		9.19	6.01	
	10 to 14 yr	25.9	8.93		29.68	8.63		12.46	6.42	
	15 to19 yr	26.93	11.74		31.64	7.88		10.5	7.62	
	>20 yr	23.5	13.52		27.67	14		8.67	6.47	
How many shifts per week you work?	3	26.22	6.46	**<0.001**	27.67	7.57	0.17	11.78	3.8	**0.02**
	4	25.87	10.93		31.51	9.85		9.22	6.43	
	5	25.2	12.41		27.76	10.53		11.22	6.69	
	6	30.91	12.18		28.73	7.03		13.32	6.06	
	7	36.42	11.52		32.21	8.14		14.42	7.49	
How many hours is your shift?	6 Hours	17.75	12.91	0.07	18.25	12.29	**0.01**	11.25	9.04	0.21
	8 hours	27.17	13.33		29.48	10.45		10.96	7.12	
	12 hours	28.87	10.66		31.62	7.48		10.97	6.29	
	16 Hours	32.77	9.66		29.46	5.43		14.38	3.99	
	>16 hours	30.29	9.86		27.29	10.19		15.57	5.77	
other official duties beside ICU work?	No	28.21	11.58	0.70	29.93	9.24	0.56	11.7	6.76	0.52
	Yes	27.39	13.26		29.02	10.09		10.98	6.64	
If you put yes, mention what duties are?	Academic	15.4	9.34	0.32	26.8	10.85	0.27	12.4	7.86	0.56
	Administrative	29.05	11.47		29.95	9.67		12.58	6.81	

If you put yes, mention what duties are?	Clinical	24.73	16.79	0.32	25.93	14.8	0.27	9.33	7.58	0.56
	More than one task	26.81	11.43		32.31	7		9.5	5.88	
	Research/other	28.92	15.18		24.54	9.3		11.85	7.07	
Smoking status	Never	27.81	10.75	0.44	31.05	8.57	**0.04**	10.66	6.17	**0.004**
	Ex-Smoker	25.43	15.25		26.38	12.52		9.62	6.98	
	Current Smoker	29.59	13.62		27.74	9.46		14.49	7.09	

Number of shifts per week was also significantly associated with the EE score ($p < 0.001$), with those having 6 or 7 shifts per week had a notably higher EE score. As for the factors associated with the low personal accomplishment score, females were observed to have a significantly higher PA score compared to males ($p = 0.01$) (31.79 + 8.24 vs 28 + 10.1).

Nurses rank was also significantly associated with PA score ($p = 0.01$), with the technicians and specialists had notably higher scores compared to senior specialist, and consultant nurses. Number of hours per shift was also significantly associated with PA score ($p = 0.01$), with those having 12 hours shifts had the highest PA score. Smoking status was also significantly associated with PA score ($p = 0.04$), with those who never smoker had a notably higher PA score compared to ex-smokers, and current smokers.

As for the factors association with depersonalization, physician rank was significantly associated with depersonalization score ($p = 0.02$), with fellow physicians having the highest score of, followed by training residents. Nurses rank was also significantly associated with DP score ($p < 0.001$), with consultant nurses had the highest DP score, and technician had the lowest DP score.

Type of job was also significantly associated with DP score ($p = 0.02$), with those having part-time job had a significantly higher DP score compared to those with full time job (17.67 + 4.55 vs 11.22 + 6.67). Number of shifts per week was also significantly associated with DP score ($p = 0.02$), where the highest DP score was observed in those with 7 shifts per week. Smoking status was also significantly associated with DP score ($p = 0.004$), where current smokers had the highest DP score compared to ex-smokers, and those who never smoked.

There was no significant difference between physicians and nurses in score or levels of burnout subscales. (Table 5).

Table 5: Association of burnout sub-scales among nurses vs physicians (n=159)

Sub-scales	Category	Nurses(n=73)		Physician (n=86)		p-value*
		N	%	N	%	
EE	Low (0-18)	12	16%	19	22%	0.08
	Moderate (19-26)	26	36%	17	20%	
	High (>27)	35	48%	50	58%	
PA	Low (>40)	13	18%	13	15%	0.79
	Moderate (34-39)	11	15%	16	19%	
	High (0-33)	49	67%	57	66%	
DP	Low (0-5)	19	26%	16	19%	0.32
	Moderate (6-9)	15	21%	14	16%	
	High (>10)	39	53%	56	65%	
Sub-scales	**Mean difference**	**Nurses(n=73)**		**Physicians(n=86)**		**p-value****
		Mean	**Standard Deviation**	**Mean**	**Standard Deviation**	
EE	-2.43	26.62	10.06	29.05	13.62	0.19
PA	1.84	30.62	8.34	28.78	10.38	0.23
DP	-1.46	10.67	6.6	12.13	6.76	0.17

*Chi-square test applied
**Independent sample t-test applied

Discussion

It has been established across many studies that healthcare workers have experienced varying degrees of burnout at some point during their work. Specifically, ICU staff reported to have burnout with varying degree of prevalence across different countries. This huge variability may be related to the setting of the studies as well as in their methodologies, with variable definitions of burnout, different ranges used in the Maslach Burnout Inventory scale and mutable cutoffs [20].

Although not recognized as a distinct mental disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM), burnout is a psychological syndrome that is experienced due to work-related stress manifested by feelings of energy depletion or exhaustion; increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and a sense of ineffectiveness and lack of accomplishment, according to ICD-11.

In current study, majority ICU physicians and nurses reported burnout. Exhaustion is the central quality of burnout and the most obvious manifestation of this complex syndrome. When people describe themselves or others as experiencing burnout, they are most often referring to the experience of exhaustion. Of the three aspects of burnout, exhaustion is the most widely reported and the most thoroughly analyzed [4].

In this study, mean score in EE subscale was 27.93 ±12.14, which indicate high burnout level.
Similar rates of general burnout were reported in Riyadh, SA (65.9%), and Egypt (68.2%) among ICU nurses of a tertiary care hospital [15,21].

Much lower rate of burnout was reported in a local study in Eastern Saudi Arabia with rate of 11.1%. The study included 8 physicians, 114 nurses and 18 respiratory therapists [19].

However, with subanalysis of burnout subscales, the results are almost similar to current study with a mean of 30.4 for EE, 11.3 for DP and 38,5 for PA. Similarly lower rate of burnout (26.7%) was reported in an American study done on nurse practitioners, physicians, registered nurses, and respiratory therapists in NICU [10].

In a review of studies about burnout among ICU nurses in Saudi Arabia, 11 studies with total of 1932 nurses, moderate to high prevalence of burnout was reported [22].

When considering the rate of high levels of burnout in the three subscales, our data is showing lower than previously reported rates in a local studies. For example, in Jazan, southern Saudi Ariba, high burnout level in EE, DP and PA was 36%, 28% and 47 % respectively which are higher than our findings [23]. Similar rates of high burnout levels across the three subscales among nurses and respiratory therapists were also reported in America and Spain [24,25].

Reported rate of burnout in current study is less than what was reported in a similar Indian study that report 80% prevalence of burnout [5]. This high prevalence in the Indian study may be explained by the fact that majority of participants were females, less than 30 years of age and had a less than a years of experience.

Current study demonstrated an association of burnout with different demographic features like gender type, physicians and nurses rank, number of shifts per week, number of hour per shift and type of job being full time or part time. Similar associations were also reported in similar studies [3,11,15,25].

Difference in level of burnout between males and females ICU workers was also reported in a local study [19]. In an American study, females' pediatric ICU doctors were more likely to report high levels of EE and low PA.9 Similar finding was also reported from Turkey [11].

Actually, female doctors across a broad range of medical specialties were found to be at higher risk of burnout compared to male doctors [26].

In current study, no difference in level of burnout was found between different age groups, However, other studies demonstrated higher levels of burnout among younger nurses [22,26]. This may be explained by the fact that younger HCW are usually inexperienced and lack self-confidence.

Although not investigated in current study, organization related factors have been reported to associate with level of burn out like workload expectations, insufficient rewards, limited interpersonal collaboration, and limited opportunities for advancement and social support [3].

Interestingly, one study investigated the effect of ICU design on burnout prevalence, and found no difference in burnout rates between multibed ICU design and single bed ICU design [27].

Working in high-stress environments, such as an ICU where health care providers are dealing with an overload of responsibility, end-of-life issues, and interpersonal conflicts may eventually lead to burnout if left unmanaged, which may ultimately affect work quality, patient care and the mental and physical health of the healthcare worker. In a systematic review, it was documented that burnout is associated with worsening of patient safety [28].

To prevent burnout at work, several strategies have been identified, such as finding meaning in one's work, connecting with an energy source, performing emotional hygiene, cultivating interpersonal relationships, cultivating a positive attitude, recognizing one's uniqueness and contributions, "Problem-Focused" coping style, taking professional, help, and meeting basic needs on regular basis [29,30].

Limitations to this study include difficulties in assessing specific psychological factors such as personality traits and coping strategies of participants, which can give us a glimpse on how an individual deals and manages work-related stress and resolve interpersonal conflicts.

The small number of participants can make it difficult to generalize results of this study to other areas.

Conclusion

ICU staff is at high risk of stress and burnout, exhaustion, depersonalization, and lack of accomplishment. Critical care societies and policymakers should step forward to draft policies and benchmarks to curb the causes of stress and reduce burnout so that job satisfaction can be improved.

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