

Prevalence and associated factors of burnout among nurses in a general hospital in Yanbu, Saudi Arabia

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Abstract

Background: Burnout is a prevalent psychological state among nurses. Burnout syndrome consists of emotional exhaustion, depersonalization, and reduced personal accomplishment, which results from prolonged stress in the workplace.

Aim: This study aimed at assessing the prevalence and associated factors of burnout among nurses in Yanbu General Hospital, Saudi Arabia.

Materials and Methods: A cross-sectional study was conducted among 249 nurses at Yanbu General Hospital, Saudi Arabia. The validated Maslach Burnout Inventory Human Services Survey for Medical Personnel was used to measure burnout. Sources of stress were assessed by 17 items. Data obtained were analyzed using the Statistical Package for the Social Sciences, version. 20. Students' t-test, correlation and analysis of variance were used to assess the relationship between variables.

Results: High burnout was found among 168 (67.5%) participants. The EE score was significantly higher among Saudis, ($p=0.004$), among those who worked >40 hours per week ($p<0.001$) and among those who had more than 8 shifts per week ($p=0.001$). The depersonalization (DP) score was significantly higher among Saudis ($p=0.014$), and among those who worked >40 hours per week ($p<0.001$). The personal accomplishment (PA) score was higher among those who had higher monthly income ($p=0.038$). Sources of stress were associated with the three scales of burnout.

Conclusion: Burnout was highly prevalent among nurses in this study and was associated significantly with work related factors and sources of stress in the workplace. Working conditions should be improved to minimize the impact and consequences of burnout among nurses.

Key words: Burnout, Mental Health, Nurses, Saudi Arabia, Source of Stress, Yanbu

Introduction

Occupational burnout is classified as “workers stress that has not been successfully managed” [1]. The triadic dimensions of burnout include emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA). While EE predisposes one towards being worn out, emotionally depleted or fatigued, DP reduces one’s work engagement, in addition to PA that identifies a sense of ineffectiveness amongst workers. This phenomenon succinctly predisposes workers toward lower productivity levels and the inability to cope [2-4], yet those afflicted with burnout exhibited higher frequencies of absenteeism, high turnovers at the workplace, or opted for early retirement due to reduced job satisfaction [5]. Greater psychological repercussions have been associated with burnout - sleep disturbances, anxiety, depression, alcohol use, and suicidal ideation [5].

With the commensurate rise in demand for health services, healthcare workers have been reported to be potentially vulnerable to burnout. The nursing workforce, in particular, have reported high levels of burnout in view of their emotionally draining job demand and prolonged patient contact in wards and clinics [6]. Approximately, 11.2% of nurses suffered the burnout syndrome worldwide [7]. Nurses working in intensive and critical care units were more likely to suffer from burnout [7].

Demographic characteristics such as gender or age and work-related (job characteristics and risk exposures) stressors among healthcare workers were known to be associated with the burnout syndrome [8-12]. As the health system delivery in Saudi Arabia underwent a major shift and restructuring exercise, nurses who formed the huge workforce within the healthcare system were geared towards managing greater job demands and expectations from clients [13]. With these escalated demands on health services and influx of patient admissions, the current study was aimed to explore the prevalence of burnout and its associated factors amongst a sample of nurses in Yanbu General Hospital, Saudi Arabia.

Materials and Methods

Study setting and sample

This cross-sectional study was conducted among nurses in Yanbu General Hospital, Yanbu al-Bahr, Saudi Arabia in 2021. Yanbu’ al Bahr is a major Red Sea port in the Al Madinah province. It is approximately 300 kilometers from Jeddah. Sample size required for this study was calculated by using G-power software. With a confidence level of 95%, and a power of 80%, minimum sample size was calculated to be 246. Out of 300 nurses in the hospital, 249 returned complete questionnaires (response rate =83%).

Inclusion and exclusion criteria

The study included all nurses who joined the hospital for more than six months. Those who joined the hospital for less than six months or declined to participate were excluded.

Study instruments

For the collection of data, the study employed a printed self-administered structured questionnaire, which comprised three sections.

- Section one included sociodemographic variables and work-related variables. Sociodemographic section included variables like gender, age, marital status, history of chronic disease, income, educational level and nationality. Work related factors included variables such as department, years of experience, working hours per day, and number of on-calls per month.
- Section two employed the Maslach Burnout Inventory-Human Services Survey for Medical Personnel (MBI-HSS (MP)), which is a reliable, widely used validated tool for assessment of burnout. It addresses three dimensions of burnout: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA). It consists of 22 items within these three dimensions (each comprising nine, five, and eight items, respectively) [14]. 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). We then summed the scores and categorized them into “low,” “moderate,” and “high” in each subscale category. Lower scores regarding personal accomplishment predicted a greater likelihood of burnout [14]. We defined burnout as the presence of at least one of the following: (i) high score (27 and above) regarding EE, (ii) high score regarding depersonalization (13 and above), and (iii) low score regarding personal accomplishment (0-31) [14]. All three subscales EE, DP, AP showed high internal consistency with Cronbach’s alpha coefficient values of 0.844, 0.867, and 0.884, respectively [14].
- In section three, we assessed sources of stress with 17 items obtained from the literature. The following question headed these items: “To what extent do the following conditions cause stress to you?” Each item was scored from 1 (causing no stress) to 4 (causing severe stress) [15,16]. The Cronbach’s alpha coefficient of these items in this study was 0.91. The questionnaire was distributed in both Arabic and English language [16].

Ethical considerations

Ethical approval was obtained from the Ethical Committee of the Institutional Review Board in Al-Medina. The objectives of the study were explained to the volunteer nurses, and written informed consent was obtained from each participant. The collected data were confidential and would not be disclosed. Participants could withdraw from the study at any time.

Statistical analysis

We performed descriptive and inferential data analysis using SPSS (version 20.0, IBM). In descriptive analysis, mean and standard deviation (SD) were obtained for the continuous variables, while frequencies and percentages were obtained for the categorical variables. Age was categorized into categories. The independent two-sample t-test and analysis of variance (ANOVA) test were used to assess the association between the burnout subscales and the independent variables. Test of normality for each

subscale of burnout was performed. The associations between the burnout subscales and the sources of stress were evaluated by Pearson correlation coefficients. P-value less than 0.05 was considered statistically significant.

Results

Sociodemographic and work characteristics of the participants

The majority were females (87.6%), Saudi (75.1%) and aged ≤ 30 years (60.2%). About a third (34.5%) had 10 years or more experience after graduation, 16.1% had administrative tasks, 62.7% worked ≤ 40 hours per week, and 70.7% had shifts (Table 1).

Sources of stress in the workplace

The most important sources of stress reported by the participants (ranked by mean) were lack of staff (3.4 ± 1.4), lack of resources (3.2 ± 1.4), work overload (3.2 ± 1.4), long working hours (3.1 ± 1.3) and negative rewards (3.0 ± 1.5) (Table 2).

Prevalence of burnout

Among the participants, 126 (50.6%) had high EE, 73 (29.3%) had high DP, and 76 (30.5%) had low PA. Of them, 49 (19.7%) showed moderate EE, 45 (18.1%) showed moderate DP, and 53 (21.3%) showed moderate PA. High burnout was found among 168 (67.5%) participants (scoring high on at least one subscale of burnout) (Table 3).

Association between burnout and sociodemographics and work characteristics

To determine the factors associated with burnout in the univariate analysis, we used the total score of EE, DP, and PA as a continuous variable. The EE score was significantly higher among Saudis (27.6 ± 8.8) compared to non-Saudis (21.2 ± 7.3), ($p=0.004$), and higher among those who worked >40 hours per week (30.7 ± 10.2) compared to those who worked ≤ 40 hours (23.2 ± 10.2) ($p<0.001$). Participants who had more than 8 shifts per week also scored higher on EE (30.0 ± 9.7) compared to those who had less than 8 shifts ($p=0.001$) (Table 4).

The DP score was significantly higher among Saudis (9.4 ± 3.2) compared to non-Saudis (6.2 ± 3.7) ($p=0.014$), and higher among those who worked >40 hours per week (11.4 ± 4.7) compared to those who worked ≤ 40 hours (7.0 ± 2.1) ($p<0.001$) (Table 4). Regarding PA, higher monthly income was associated with higher PA ($p=0.038$) (Table 4).

Association between burnout and sources of stress in the workplace

All 17 sources of stress in this study correlated positively and significantly with EE with the r coefficients ranging from 0.629 to 0.346 ($p<0.001$).

Out of 17 sources of stress in this study, 15 correlated positively and significantly with EE with the r coefficients ranging from 0.361 to 0.131 ($p<0.050$). There was no association between PA and sources of stress (Table 5).

Table 1: Sociodemographic and work characteristics of the participants (n=249)

Characteristics	No.	%
Age		
• ≤30	150	60.2
• >30	99	39.8
Gender		
• Male	31	12.4
• Female	218	87.6
Nationality		
• Saudi	187	75.1
• Non-Saudi	62	24.9
Marital status		
• Married	152	61.0
• Not married	97	39.0
Have you had (Covid-19)		
• Yes	39	15.7
• No	210	84.3
Educational level		
• Diploma	123	49.4
• Bachelor	126	50.6
Chronic diseases		
• No	230	92.4
• Yes	19	7.6
Income (SAR)		
• <8000	72	28.9
• 8000-12000	118	47.4
• >12000	59	23.7
Department		
• Internal Medicine, Pediatrics, Outpatient clinics	74	29.7
• Surgery, Orthopedics, Neurosurgery Obstetrics and Gynecology	57	22.9
• ICU, Emergency	91	36.5
• Others	27	10.8
Years of service		
• <5	78	31.3
• 5-9	85	34.1
• ≥10	86	34.5
Do you have administrative tasks		
• Yes	40	16.1
• No	209	83.9
Working hours per week		
• ≤40	156	62.7
• >40	93	37.3
Do you have shifts		
• Yes	176	70.7
• No	73	29.3
Shifts per week (n=176)		
• ≤4	87	49.4
• 5-8	25	14.2
• >8	64	36.4

Table 2: Sources of stress in the workplace

Sources of stress	Mean	Standard deviation
Work overload	3.2	1.4
Long working hours	3.1	1.3
Fear of violence	2.5	1.4
Work environment	2.6	1.5
Lack of resources	3.2	1.4
Fear of making mistakes that can lead to serious consequences	2.7	1.4
Working with uncooperative colleagues	2.5	1.4
Work in offices	1.9	1.2
Cannot participate in decision making	2.1	1.3
Work demands affect my personal/home life	2.6	1.4
Lack of staff	3.4	1.4
Worries about finances	2.8	1.6
Negative rewards	3.0	1.5
Interaction with patients and relatives	2.3	1.3
Time pressure and difficulty to meet deadlines	2.5	1.3
Office work	2.0	1.3
Fear of getting Covid19	2.5	1.5

Table 3: Prevalence of burnout among participants

Dimensions of burnout	Low n (%)	Moderate n (%)	High n (%)
Emotional exhaustion (EE)	74 (29.7)	49 (19.7)	126 (50.6)
Depersonalization (DP)	131 (52.6)	45 (18.1)	73 (29.3)
Personal achievement (PA)	76 (30.5)	53 (21.3)	120 (48.2)

EE: High: >27 Moderate: 17–26 Low: 0–16
 DP: High: >13 Moderate: 7–12 Low: 0–6
 PA: Low: 0–31 Moderate: 32–38 High: >39

Table 4: Association between burnout and sociodemographic and work characteristics

Personal Characteristics	Emotional Exhaustion		Depersonalization		Personal Accomplishment	
	Mean (SD)	P-value	Mean (SD)	P-value	Mean (SD)	P-value
Age						
- ≤30	25.4 (9.7)	0.422	8.3 (2.9)	0.470	34.3 (7.2)	0.079
- >30	26.9 (9.1)		9.1 (4.2)		36.7 (8.2)	
Gender						
- Male	24.4 (9.2)	0.514	10.1 (4.4)	0.358	34.5 (8.6)	0.692
- Female	26.2 (9.5)		8.4 (3.3)		35.4 (7.6)	
Nationality						
- Saudi	27.6 (8.8)	0.004	9.4 (3.2)	0.014	39.5 (6.4)	0.533
- Non-Saudi	21.2 (7.3)		6.2 (3.7)		41.6 (7.6)	
Marital status						
- Married	25.0 (8.1)	0.523	8.3 (3.8)	0.669	36.1 (7.3)	0.13
- Not married	26.3 (8.9)		8.8 (3.3)		33.9 (8.1)	
Have you had a Covid-19						
- Yes	26.3 (9.0)	0.876	9.0 (3.0)	0.729	35.5 (9.2)	0.894
- No	25.9 (9.6)		8.5 (3.5)		35.2 (7.4)	
Educational level						
- Diploma	27.7 (8.5)	0.076	9.7 (3.2)	0.052	35.2 (8.0)	0.961
- Bachelor	24.4 (9.2)		7.6 (3.5)		35.3 (7.4)	
Chronic diseases						
- No	25.5 (9.4)	0.066	8.4 (3.5)	0.244	35.0 (8.0)	0.342
- Yes	31.9 (8.7)		10.7 (2.8)		37.9 (2.4)	
Income (SAR)						
- <8000	22.6 (9.6)	0.062	7.1 (4.3)	0.143	33.8 (6.7)	0.038
- 8000-12000	27.4 (9.0)		8.9 (2.7)		35.1 (7.6)	
- >12000	27.4 (8.5)		9.8 (3.6)		37.8 (8.5)	
Department						
- Internal Medicine, Pediatrics, Outpatient clinics	25.9 (8.5)		8.8 (2.7)		35.7 (7.3)	0.103
- Surgery, Orthopedics, Neurosurgery Obstetrics and Gynecology	24.3 (9.3)		9.6 (2.2)		32.2 (7.8)	
- ICU, Emergency	27.8 (10.6)	0.876	8.3 (4.5)	0.552	36.3 (8.2)	
- Others	23.9 (9.5)		7.0 (3.7)		36.7 (5.7)	
Years of service						
- <5	24.3 (10.3)	0.350	7.5 (2.8)	0.321	36.3 (5.3)	0.474
- 5-9	26.1 (8.6)		8.7 (2.9)		35.2 (7.8)	
- ≥10	27.5 (9.5)		9.5 (4.3)		34.3 (9.3)	
Do you have administrative tasks						
- Yes	24.6 (9.5)	0.513	8.3 (2.6)	0.784	33.6 (8.2)	0.398
- No	26.3 (9.5)		8.7 (3.6)		35.6 (7.6)	

Table 4: Association between burnout and sociodemographic and work characteristics (continued)

Personal Characteristics	Emotional Exhaustion		Depersonalization		Personal Accomplishment	
	Mean (SD)	P-value	Mean (SD)	P-value	Mean (SD)	P-value
Working hour per week						
- ≤40	23.2 (8.3)	<0.001	7.0 (2.1)	0.001	35.7 (7.5)	0.392
- >40	30.7 (10.2)		11.4 (4.7)		34.5 (7.9)	
Do you have shifts						
- Yes	26.1 (10.2)	0.913	8.5 (3.5)	0.736	35.4 (7.8)	0.491
- No	25.9 (7.7)		8.9 (3.3)		34.9 (7.5)	
Shifts per week (n=176)						
- ≤4	19.2 (9.7)	0.001	6.5 (4.2)	0.176	36.2 (7.9)	0.626
- 5-8	23.4 (9.4)		7.7 (3.8)		34.6 (10.2)	
- >8	30.0 (9.7)		9.6 (3.3)		34.6 (6.5)	

SD: Standard deviation

Table 5: Association between burnout and sources of stress in the workplace

Sources of Stress	Emotional Exhaustion		Depersonalization		Personal Accomplishment	
	r	P-value	r	P-value	r	P-value
Work overload	0.475	<0.001	0.206	0.001	0.194	0.222
Long working hours	0.493	<0.001	0.212	0.001	0.114	0.074
Fear of violence	0.519	<0.001	0.383	<0.001	0.051	0.433
Work environment	0.582	<0.001	0.369	<0.001	0.027	0.674
Lack of resources	0.405	<0.001	0.131	0.039	0.137	0.331
Fear of making mistakes that can lead to serious consequences	0.467	<0.001	0.299	<0.001	0.067	0.289
Working with uncooperative colleagues	0.476	<0.001	0.279	<0.001	0.048	0.449
Work in offices	0.393	<0.001	0.285	<0.001	0.112	0.082
Cannot participate in decision making	0.443	<0.001	0.274	<0.001	0.087	0.173
Work demands affect my personal/home life	0.629	<0.001	0.339	<0.001	-0.041	0.519
Lack of staff	0.474	<0.001	0.118	0.062	0.061	0.346
Worries about finances	0.277	<0.001	0.116	0.067	0.068	0.285
Negative rewards	0.524	<0.001	0.309	<0.001	-0.106	0.094
Interaction with patients and relatives	0.459	<0.001	0.361	<0.001	-0.075	0.238
Time pressure and difficulty to meet deadlines	0.426	<0.001	0.322	<0.001	0.044	0.485
Office work	0.363	<0.001	0.319	<0.001	0.022	0.727
Fear of getting Covid19	0.346	<0.001	0.193	0.002	0.136	0.231

r: Correlation coefficient

Discussion

This study aimed to explore the prevalence of burnout and its associated factors amongst a sample of nurses in Yanbu General Hospital, Saudi Arabia. The current study found that the prevalence of burnout was approximately 67.5%. High EE was found among 50.6% of the nurses, while 29.3% and 30.5% of the sample had high DP and low PA respectively. The magnitude of burnout prevalence amongst nurses seemed inconsistent across the local and international literature. A recent study among primary healthcare nurses in Saudi Arabia reported the overall prevalence of burnout to be 89%; with 39% of them specifically reporting to have high EE, 38% had high DP, while 89% had low PA [15].

A study of multinational nurses working in Saudi Arabia found that 45% of the sample had high EE, 42% had high DP and 71.5% had low PA [17]. Approximately 52.8% of nurses from Egypt exhibited high EE, 7.2% had high DP and 96.5% of them exhibited low PA [18]. While a study from Israel reported high EE, high DP and low PA to affect approximately 30.8%, 5.1% and 84.6% of their nursing sample respectively [19], another Jordanian study reported nearly 55% of their nurses were afflicted with high EE, while high DP and low PA accounted for 50% each [20]. Plausible explanations of such inconsistencies could be explained by the variations in patient culture across different populations and the role of nurses according to different specialties and healthcare settings based on demand needs and services (either in rural or urban areas; or between inpatient or outpatient care) that overwhelms nurses tasks capacities.

The associations between burnout and socio-demographic characteristics seemed subjective and varied across different studies. The current study found that Saudi nurses had higher burnout as compared to non-Saudis. This finding was contradictory to a previous study from Saudi Arabia [21].

This study found a significantly higher burnout score amongst nurses who worked for more than 40 hours per week (EE and DP) and those who had more than 8 shifts per week (EE score). Previous Saudi Arabian studies showed mixed findings, with one showing consistency with the current study [15], while two others were contrary to the current findings [12,21].

There were multiple work-related stressors significantly associated with burnout among nurses in this study. Consistent with previous burnout literature across different healthcare worker populations [5,13,16,22,24], nurses in this study reported work overload, long working hours, and time pressure and deadlines as stressors that increased their burnout level. Succinctly, burnout not only catalyzes serious personal repercussions like substance abuse or family conflicts at the individual level [25,26], but also compromises the efficiency of health systems and patient satisfaction with health services at the institutional level [27,28].

Consistent with these previously evidenced burnout impacts, the current study found that nurses who perceived work demands as affecting personal or home life, having fear of making mistakes that can lead to serious consequences while working and worries about finances were significantly associated with burnout.

Factors of negative rewards and restrictions on nurses for not being able to participate in decision making also showed positive relationships with burnout scores in the current study. It is noteworthy to understand that reward is an important criterion to motivate a person to work efficiently [29,30], yet to prevent mental well-being deterioration from work stress or emotional burnout [31]. The Effort-Reward Imbalance Model necessitates the equilibrium between work efforts and rewards to be executed through triadic domains: salary, prestige, and job security [32], similarly advocated by a previous study amongst medical residents in Malaysia [22].

Statistically significant correlations between burnout scores with nurses' fear toward encountering violence in the workplace, working in an office setting and working with uncooperative colleagues were observed in this study. These findings were consistent with previous works conducted amongst Spanish [33], Saudi Arabian and multi-national nurses working in Saudi Arabia [13,15,34]. The non-conducive friendly workplace setting, and the bullying phenomenon that emerges as a consequence of individual's behaviour within an organization has been postulated to elevate stress, burnout, frustrations and intention to leave service among healthcare workers in previous studies [22,35,37].

The current study found a statistically significant correlation between fear of getting Covid-19 and burnout among nurses. Similar findings were observed in previous studies [38,39]. The outbreak of COVID-19 has escalated patient admission to hospitals and consequently increased the workload of frontline nurses [38]. During a health crisis or an outbreak, nurses would be given new roles and are required to carry out additional tasks which may be beyond the scope of their usual nursing role or capacities [38,40].

As the current pandemic has overwhelmed healthcare systems, most countries worldwide were forced to implement strict mitigation and suppression measures to flatten the epidemic curve or to achieve the somewhat "herd immunity" through mass vaccination programs [41-44]. Frontline healthcare workers are often deployed to complement shortage of staff and healthcare resources. These circumstances may pose escalated burden on frontline nurses, yet being emotionally fatigued or burned out [45].

Under these situations, nurses would encounter greater interactions with patients or relatives with Covid-19, and working under more compact environments; both showed statistically significant correlations with burnout in the current study. Studies have shown that compactness of people is a factor spread for COVID-19[46], and the

infection rate amongst frontline healthcare workers was higher in urban hospitals with higher population density [47]. These plausible factors may have influenced nurses fear of getting Covid-19, yet increased their level of burnout with current job demands.

The limitations of this study need to be acknowledged. The cross-sectional nature of the investigation cannot establish causal inferences. The self-reported survey among the respondents may be subjected to social desirability or recall bias. The relatively small sample size from a single-hospital limits the generalizability of the study findings.

Conclusions

This study revealed that the overall burnout rate was relatively high among the nurses. Saudi nurses, nurses working on shifts and long working hours were associated with the burnout phenomenon in the current sample. Work-related stressors ultimately provoked the burnout syndrome. Organization's systemic changes to relieve overload of routine work and proactive psychological support are recommended to sustain the emotional and mental health wellbeing of the nursing workforce.

References

1. World Health Organization. Burn-out an "occupational phenomenon." International classification of diseases [homepage on the Internet]. Departmental News: WHO; 2019 May [cited 2021 September 10]. Available from: https://www.who.int/mental_health/evidence/burn-out/en/
2. Maslach C, Leiter MP. Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry* 2016; 15(2):103-111.
3. Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annual Review of Psychology* 2001; 52: 397– 422.
4. Maslach C, Leiter MP. Understanding burnout. In: *The Handbook of Stress and Health* [chapter on the Internet]. Chichester, UK: John Wiley & Sons, Ltd; 2017 [cited 2021 Feb 23]. p. 36–56. Available from: <http://doi.wiley.com/10.1002/9781118993811.ch3>
5. Aldubai SAR, 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 [published correction appears in *Journal of Family Medicine and Primary Care* 2019; 8(3):1293]. *Journal of Family Medicine and Primary* 2019;8(2):657-662.
6. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. A model of burnout and life satisfaction amongst nurses. *Journal of Advanced Nursing* 2000; 32:454–464.
7. Woo T, Ho R, Tang A, Tam W. Global prevalence of burnout symptoms among nurses: A systematic review and meta-analysis. *Journal of Psychiatric Research* 2020; 123: 9–20.
8. Adriaenssens J, De Gucht D, Maes S. Determinants and prevalence of burnout in emergency nurses: A systematic review of 25 years of research. *International Journal of Nursing Studies* 2015; 52: 649–661.
9. Gonnelli C, Raffagnino R. Work–family conflict in nursing: An integrative review of its antecedents and outcomes. *Journal of Psychology and the Behavioral Sciences* 2017; 3(1): 61–84.
10. Raffenaud A, Unruh L, Fottler M, Liu AX, Andrews D. A comparative analysis of work–family conflict among staff, managerial, and executive nurses. *Nursing Outlook* 2020; 68: 231–241.
11. Seidler A, Thinschmidt M, Deckert S, Then F, Hegewald J, Nieuwenhuijsen K, et al. The role of psychosocial working conditions on burnout and its core component emotional exhaustion: A systematic review. *Journal of Occupational Medicine and Toxicology* 2014; 9:10.
12. Alsayed RA, Al-Dubai SAR, Ibrahim HM. Burnout and associated factors among nurses working in a mental health hospital, Madinah, Saudi Arabia. *The Egyptian Journal of Community Medicine* 2021; 39(3):10-20.
13. Batayneh M, Ali S, Nashwan A. The burnout among multinational nurses in Saudi Arabia. *Open Journal of Nursing* 2019; 9: 603-619.
14. Al-Yami AH, Al-Enezi NK, Al-Yami RH, Al-Rehaili BO, Al-Dubai SA. Prevalence and associated factors of burnout among resident doctors in Tabuk, Saudi Arabia. *ASEAN Journal of Psychiatry* 2021; 22(3):1-6.
15. 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.
16. Al-Dubai SA, Rampal KG. Prevalence and associated factors of burnout among doctors in Yemen. *Journal of Occupational Health* 2010; 52(1):58-65.
17. Al-Turki HA, Al-Turki RA, Al-Dardas HA, Al-Gazal MR, Al-Maghrabi GH, Al-Enizi NH, et al. Burnout syndrome among multinational nurses working in Saudi Arabia. *Annals of African Medicine* 2010; 9(4):226-229.
18. Abdo SA, El-Sallamy RM, El-Sherbiny AA, Kabbash IA. Burnout among physicians and nursing staff working in the emergency hospital of Tanta University, Egypt. *Eastern Mediterranean Health Journal* 2016; 21: 906–915.
19. Emold C, Schneider N, Meller I, Yagil Y. Communication skills, working environment and burnout among oncology nurses. *European Journal of Oncology Nursing* 2011; 15: 358–363.
20. Hamaideh SH. Burnout, social support, and job satisfaction among Jordanian mental health nurses. *Issues in Mental Health Nursing* 2011; 32: 234–242.
21. Alqahtani AM, Awadalla NJ, Alsaleem SA, Alsamghan AS, Alsaleem MA. Burnout syndrome among emergency physicians and nurses in Abha and Khamis Mushait Cities, Aseer Region, Southwestern Saudi Arabia. *Scientific World Journal* 2019; 2019: 4515972.
22. 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. *Scientific World Journal* 2013; 2013:137620.
23. Khoo EJ, Aldubai S, Ganasegeran K, Lee BX, Zakaria NA, Tan KK. Emotional exhaustion is associated with work related stressors: a cross-sectional multicenter study in Malaysian public hospitals. *Arch Argent Pediatr* 2017; 115(3):212-219.

24. Shah MK, Gandrakota N, Cimiotti JP, Ghose N, Moore M, Ali MK. Prevalence of and factors associated with nurse burnout in the US. *JAMA Netw Open* 2021; 4(2): e2036469.
25. Oreskovich MR, Kaups KL, Balch CM, Hanks JB, Satele D, Sloan J, et al. Prevalence of alcohol use disorders among American surgeons. *Archives of surgery* 2012; 147:168–174.
26. Aminah A. Work-family conflict among junior physicians: Its mediating role in the relationship between role overload and emotional exhaustion. *Journal of Social Sciences* 2010; 6:265–271.
27. Kang E-K, Lihm H-S, Kong E-H. Association of intern and resident burnout with self-reported medical errors. *Korean Journal of Family Medicine* 2013; 34:36–42.
28. Ganasegeran K, Perianayagam W, Manaf RA, Jadoo SA, Al-Dubai SA. Patient satisfaction in Malaysia's busiest outpatient medical care. *Scientific World Journal* 2015; 2015:714754.
29. Awajeh AM, Issa MR, Rasheed AM, Amirah MF. Burnout among critical care nurses in King Saud Medical City (KSMC). *Journal of Nursing and Care* 2018; 7(2): 1000450.
30. Sararaks S, Jamaluddin R. Demotivating factors among government doctors in Negeri Sembilan. *Medical Journal of Malaysia* 1999; 54(3): 310–319.
31. Bovier PA, Arigoni F, Schneider M, Gallacchi MB. Relationships between work satisfaction, emotional exhaustion and mental health among Swiss primary care physicians. *European Journal of Public Health* 2009; 19(6): 611–617.
32. Siegrist J. Place, social exchange and health: proposed sociological framework. *Social Science & Medicine* 2000; 51(9): 1283–1293.
33. La Fuente GAC, Vargas C, San Luis C, Garcia I, Canadas GR, De la Fuente EI. Risk factors and prevalence of burnout syndrome in the nursing profession. *International Journal of Nursing Studies* 2015; 52(1): 240–249.
34. Rayan A, Sisan M, Baker O. Stress, workplace violence, and burnout in nurses working in King Abdullah Medical City during Al-Hajj season. *Journal of Nursing Research* 2019; 27(3): e26.
35. Fu C, Ren Y, Wang G, Shi X, Cao F. Fear of future workplace violence and its influencing factors among nurses in Shandong, China: a cross-sectional study. *BMC Nursing* 2021; 20(1):123.
36. Awai NS, Ganasegeran K, Abdul Manaf MR. Prevalence of workplace bullying and its associated factors among workers in a Malaysian public university hospital: a cross-sectional study. *Risk Management and Healthcare Policy* 2021; 14:75–85.
37. Ali Jadoo SA, Aljunid SM, Dastan I, Tawfeeq RS, Mustafa MA, Ganasegeran K, et al. Job satisfaction and turnover intention among Iraqi doctors -a descriptive cross-sectional multicentre study *Human Resources for Health* 2015; 13:21.
38. Hu D, Kong Y, Li W, Han Q, Zhang X, Zhu LX, et al. Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study. *EClinicalMedicine* 2020; 24:100424.
39. Labrague LJ, de Los Santos JAA. Fear of COVID-19, psychological distress, work satisfaction and turnover intention among frontline nurses. *Journal of Nursing Management* 2021; 29(3): 395–403.
40. Gebbie KM, Qureshi K. Emergency and disaster preparedness: core competencies for nurses: what every nurse should but may not know. *The American Journal of Nursing* 2002; 102(1): 46–51.
41. Rampal L, Liew BS, Choolani M, Ganasegeran K, Pramanick A, Vallibhakara SA, et al. Battling COVID-19 pandemic waves in six South-East Asian countries: A real-time consensus review. *Medical Journal of Malays* 2020; 75:613–625.
42. Morgantini LA, Naha U, Wang H, Francavilla S, Acar O, Flores JM, et al. Factors contributing to healthcare professional burnout during the COVID-19 pandemic: A rapid turnaround global survey. *Plos One* 2020; 15(9): e0238217.
43. Ganasegeran K, Ch'ng ASH, Looi I. COVID-19 in Malaysia: Crucial measures in critical times. *Journal of Global Health* 2020; 10:020333.
44. Ganasegeran K, Ch'ng ASH, Looi I. What is the estimated COVID-19 reproduction number and the proportion of the population that needs to be immunized to achieve herd immunity in Malaysia? A mathematical epidemiology synthesis. *COVID* 2021; 1(1):13–19.
45. Elghazally SA, Alkarn AF, Elkhayat H, Ibrahim AK, Elkhayat MR. Burnout impact of COVID-19 pandemic on health-care professionals at Assiut University Hospitals, 2020. *International Journal of Environmental Research and Public Health* 2021; 18:5368.
46. Ganasegeran K, Jamil MFA, Ch'ng ASH, Looi I, Peariasamy KM. Influence of population density for COVID-19 spread in Malaysia: an ecological study. *International Journal of Environmental Research and Public Health* 2021; 18: 9866.
47. Barrett ES, Horton DB, Roy J, Gennaro ML, Brooks A, Tischfield J, et al. Prevalence of SARS-CoV-2 infection in previously undiagnosed health care workers in New Jersey, at the onset of the U.S. COVID-19 pandemic. *BMC Infectious Diseases* 2020; 20(1):853.