


BMJ Open Burnout and coping strategies among nurses in Malaysia: a national-level cross-sectional study

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ABSTRACT

Objective This national-level study aimed to determine the prevalence and risk factors of burnout, as well as the coping strategies among nurses in the Ministry of Health (MOH) Malaysia.

Design Using a complex sampling design, a two-stage stratified cluster sampling was performed to recruit MOH nurses between August and November 2019.

Setting and participants A total of 2428 nurses from 32 hospitals and 28 district health offices answered the questionnaires based on Maslach Burnout Inventory for Human Services and Brief COPE. Complex sampling analysis was applied.

Outcome measures The outcome of interest was the prevalence of burnout and its three domains of emotional exhaustion (EE), depersonalisation (DP) and low personal accomplishment. ORs using 95% CIs were calculated. Significant factors at the univariate level were entered into the multivariate logistic regression to identify independent predictors of burnout.

Results One in four (24.4%) nurses experienced burnout. Younger, single, and childless nurses had a higher prevalence of burnout. Shift working nurses were 1.6 times more likely to develop burnout. Those who performed >6 night shifts per month were 1.5 times more predisposed to burnout (95% CI 1.01 to 2.36; $p<0.05$). While encountering traumatic events at work led to 4.2 times (95% CI 2.31, 7.63; $p<0.05$) higher risk of burnout, those who received post-traumatic psychological support were better protected. The use of dysfunctional coping strategies was detrimental as it was positively correlated with EE and DP.

Conclusion Addressing modifiable stressors of burnout at individual and institutional levels identified in this study can be potentially beneficial in reducing burnout and its undesirable effects among nurses. Interventions that promote positive coping strategies should be implemented. Organisational-driven efforts must target the improvement of work schedules for nurses and the establishment of a structured debriefing service for post-trauma counselling.

INTRODUCTION

The concept of burnout was first described by Freudenberger as a syndrome of exhaustion of psychological and physical resources that commonly inflicts teachers, healthcare professionals and social workers.¹ In 2019,

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ National-level study with a prominent sample size representative of the nursing population from both primary care and hospital settings in the public healthcare sector of a developing nation.
- ⇒ The use of Maslach Burnout Inventory for Human Services and Brief COPE, two internationally used tools, facilitates the comparison of burnout and coping strategies with other studies in the literature.
- ⇒ Complex sampling analysis improves the precision of sample estimates by ensuring nursing populations from multiple stages of sampling have an equal probability of being in the sample.
- ⇒ Causal relationships cannot be derived from the cross-sectional analysis as the exposure and outcome were assessed at the same time.
- ⇒ Potential recall bias and social desirability bias from self-administered questionnaires.

under the 11th revision of the International Classification of Diseases, burnout was categorised as an occupational phenomenon² resulting from chronic workplace stress that has not been successfully managed. The burnout syndrome encompasses three dimensions, namely, emotional exhaustion (EE; feelings of energy depletion), depersonalisation (DP; increased mental distance from one's job) and personal accomplishment (PA; reduced professional efficacy).³ Coping strategies, when applied appropriately in a timely manner, can reduce or even prevent the onset of burnout. The importance of instilling positive coping strategies has been emphasised in relevant burnout literature.

Globally, the prevalence of burnout in the health sector has been extensively studied due to its close linkage with the well-being and productivity of healthcare workers (HCWs).⁴ As early as 2013, a systematic review reported a burnout prevalence of 22%–40% among nurses in 10 European countries.⁵ Recent studies reported that burnout and poor mental well-being among HCWs can



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lead to higher absenteeism and turnover rates. In addition to the significant financial costs from brain drain, burnout is also associated with increased adverse events and poorer patient satisfaction, subsequently leading to poorer quality of patient care.⁶⁻⁹

The healthcare sector in Malaysia is a public-private dichotomous system. The public healthcare system under the Ministry of Health (MOH) is the main healthcare service provider. Nurses represent the backbone of the healthcare workforce in the MOH facilities. With an increasing workload, the nursing work environment is becoming more demanding and challenging, thus predisposing nurses to burnout. To date, the majority of burnout-related studies in Malaysia were single centred, hospital based, or focused solely on medical doctors.¹⁰⁻¹² As the primary gatekeepers of MOH facilities, nurses are often the first line of contact with the general public. To ensure that nurses can function optimally in a healthy working environment to ensure patients' well-being, it is imperative to investigate the extent of the burnout phenomenon among them. By identifying the predisposing factors and the commonly practised coping strategies among the at-risk nurses, the necessary mitigation measures can be put in place.

In view of the scarcity of national-level data, this study aimed to determine the prevalence of burnout syndrome among nurses in MOH facilities in Malaysia as well as its association with the relevant sociodemographic and professional characteristics using the data from a national survey conducted in 2019, right before the COVID-19 pandemic. We also examined coping strategies used by nurses in dealing with stressful conditions at work. Our findings can provide vital baseline information on burnout among nurses during the prepandemic era in the attempt to guide the planning and implementation of preventive actions, especially following the immeasurable workload and occupational burden brought on by the COVID-19 pandemic.

MATERIAL AND METHODS

A national-level cross-sectional study was conducted from September to December 2019 among the nurses working in the hospital and primary care settings under the MOH Malaysia. Complex sampling was applied to obtain a nationally representative population of nurses. A total of 2516 nurses from both the hospital and primary care settings were selected using a multistage stratified random sampling. Those who were on leaves of absence and with underlying psychiatric illness were excluded.

The sample size was calculated based on a single proportion for prevalence estimation. Based on a 27.3% estimated prevalence of burnout,¹³ a design effect of 2.5, and a non-response rate of 20%, the sample size required for a single data analysis was 953. However, as this consisted of two main groups of nurses from primary care and hospital settings, the sample size

was multiplied by two and became 1906. Based on the latest workforce distribution data by the MOH Nursing Board, the proportion of nurses working in hospital and primary care settings were 82% and 18%, respectively. Thus, the sample size required from hospitals was 1563 ($1906 \times 82\%$). However, due to the low sample size on the primary care side ($1906 \times 18\% = 343$), it was adjusted to 953, the minimum sample size. Thus, the total sample size required for the study was 2516.

After that, a two-stage stratified cluster sampling was performed to select one state from each of the six zones in Malaysia, followed by the secondary stratum that was made up of 32 hospitals and 28 DHOs selected randomly from the six states in the primary stratum. Allocation of the sample to each state in Malaysia was done proportionately to the population size of nurses working in each state. The respondents were then randomly chosen from a list of nurses obtained from the liaison officers at each facility. A briefing was given to them to explain the study objectives to the respondents and to highlight that their participation would be voluntary. Strict confidentiality was maintained and no identifier was used in the questionnaire. The participants were required to provide written informed consent before filling up the self-administered questionnaire. Completed questionnaires were returned to the investigators during the same session.

The questionnaire was prepared in dual languages of English and Malay (the national language of Malaysia). The first section of the questionnaire extracted information on the sociodemographic and professional characteristics of the nurses such as independent variables, namely age, gender, marital status, number of children and household income. Based on the Malaysian Department of Statistics (DOSM) Household Income and Basic Amenities Survey 2019, monthly household income categories in Malaysia were categorised as B40, M40 and T20, representing the bottom 40% (less than MYR 4360), middle 40% (MYR4361-9619) and the top 20% of income earners (more than MYR 9620).¹⁴

In the next section, the Maslach Burnout Inventory for Human Services (MBI-HSS) was used to measure burnout syndrome among nurses. It comprises 22 items under three domains: EE (nine items), DP (five items) and PA (eight items). All items are rated on a seven-point Likert scale from zero (never), one (few times a year), two (once a month), three (a few times a month), four (once a week), five (a few times a week) to six (every day). The total values from each domain were summed up. The cut-off scores for EE, DP and PA are >27 , >13 , and <32 , respectively. In this study, the operational definition of burnout followed the description whereby a nurse would be considered burned out if he or she scored high on the dimensions of EE, DP or both.¹⁵ The translated version of MBI-HSS in the Malay language showed an overall Cronbach's alpha of 0.803, indicating a good internal consistency, thus making it culturally acceptable to be used in Malaysia.¹⁶

The Malay version¹⁷ of the Brief COPE¹⁸ was used to measure strategies used for coping with stress. The questionnaire is made up of 28 items grouped into 14 subscales measuring three coping strategies: dysfunctional (venting, denial, substance use, behavioural disengagement, self-distraction and self-blame), problem focused (active coping, planning and use of instrumental support) and emotion focused (use of emotional support, positive reframing, acceptance, religion and humour).

The data were analysed using Statistical Package for the Social Science (SPSS V.22). The levels of overall burnout and its three domains (EE, DP and PA) were the outcomes of interest in this study. Following complex sampling analysis procedures, the prevalence of burnout was calculated using sample weights and compared among all nurses under the MOH facilities in Malaysia. Sample weightage was carried out to allow references from persons included in the sample to the populations from which they were drawn. It was to allow unbiased estimates, taking account into the fact that all persons in the population would not have the same probability of selection. ORs using 95% CIs were calculated for categorical variables. Significant factors with a p value <0.25 at the univariate level were entered into the multivariate logistic regression to identify independent predictors of burnout. The correlation matrix showed no sign of pairwise collinearity as all correlation coefficients were below 0.7. On top of that, all the variables met the assumption of collinearity (tolerance <1, Variance Inflation Factor <5). Therefore, multicollinearity was not a concern.

PATIENT AND PUBLIC INVOLVEMENT

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

RESULTS

A total of 2428 nurses participated in the survey, giving a response rate of 93.9%. After data cleaning, responses from 2418 nurses were included in the final analysis. **Table 1** shows the baseline characteristics of respondents. The majority of them were married (83.7%), had one to three children (59.2%) and between 31 and 40 years old (42.7%). More than half of the respondents (71.2%) had a diploma and had worked for more than 10 years (55.3%). Approximately two-thirds of the nurses (67.2%) spent more than half of their working hours performing direct clinical care on patients. As high as 63.1% of the respondents had to perform on-call or extended hour duties beyond normal working hours more than three times a month.

Table 2 summarises the prevalence of burnout based on baseline characteristics. Based on the results, approximately one in every four nurses (24.4%, 95% CI 17.7 to 32.6) suffered from burnout syndrome with high scores in EE, DP or both. The MBI score showed

Table 1 Baseline characteristics of the nurses

	Variables	N	%
Age	Mean age (SD)	36.9 (8.1)	
Age group (years)	21–30	638	26.4
	31–40	1033	42.7
	> 40	747	30.9
Marital status	Single	395	16.3
	Married	2023	83.7
No. of children	No child	502	20.9
	1–3 child	1419	59.2
	>3 child	475	19.9
Education level	Certificate	569	23.6
	Diploma	1720	71.2
	Degree and above	126	5.2
Household income	B40	788	37.0
	M40	1173	55.0
	T20	171	8.0
Level of healthcare	Hospital	1524	63.0
	Primary care	894	37.0
Year of service (years)	1–5	435	18.2
	6–10	635	26.5
	>10	1322	55.3
Time spent on clinical activities	>50%	1547	67.2
	<50%	756	32.8
Shift work	Yes	1056	44.6
	No	1311	55.4
Total number of shifts per month	>24x	544	49.8
	<24x	549	50.3
Number of night shifts per month (evening+night)	> 6x	409	40.7
	1–6x	596	59.3
Number of double shifts per month	> 5x	103	25.9
	1–4x	294	74.1
Number of on calls/extended hours per month	1–3x	324	36.9
	4–6x	217	24.7
	>7x	338	38.4
Sleeping hours	<6 hours	673	28.8
	6–7 hours	1305	55.9
	>7 hours	358	15.3
Encountered traumatic events at work	Yes	667	27.7
	No	1737	72.3
Received debriefing/psychological support for post-traumatic events	Yes	189	28.8
	No	468	71.2
Travelling time to the workplace	>30min	444	18.5
	16–30min	817	34.1
	<15min	1138	47.4

that 41.6% (95% CI 35.5 to 48.0) of the nurses suffered from low PA, followed by 23.9% (95% CI 17.3 to 32.1) with high EE, and 4.5% (95% CI 2.2 to 9.1) with high DP. Younger age group (35.8, 95% CI 28.3 to 44.0), single (29.1, 95% CI 13.2 to 52.5) and childless (35.3,

Table 2 Prevalence of burnout and the domains of emotional exhaustion, depersonalisation and low personal accomplishment among nurses by sociodemographic and professional characteristics

Prevalence rate	Overall burnout (95% CI)	High EE (95% CI)	High DP (95% CI)	Low PA (95% CI)
Overall nurses	24.4 (17.7 to 32.6)	23.9 (17.3 to 32.1)	4.5 (2.2 to 9.1)	41.6 (35.5 to 48.0)
Age group (years)				
21–30	35.8 (28.3 to 44.0)	35.3 (28.3 to 42.9)	8.3 (4.8 to 13.9)	48.0 (41.0 to 55.0)
31–40	24.2 (17.5 to 32.4)	23.4 (17.1 to 31.0)	4.4 (2.1 to 9.2)	40.5 (34.3 to 47.1)
>40	15.5 (7.5 to 29.3)	15.3 (7.4 to 29.1)	1.6 (0.5 to 4.8)	37.6 (26.6 to 50.1)
Marital status				
Single	29.1 (13.2 to 52.5)	28.9 (13.2 to 52.0)	6.7 (2.5 to 17.0)	59.7 (36.7 to 79.2)
Married	23.4 (18.4 to 29.4)	22.9 (17.8 to 28.8)	4.1 (1.7 to 9.3)	37.9 (30.7 to 45.6)
No. of children				
No child	35.3 (30.1 to 40.8)	35.1 (30.1 to 40.4)	7.0 (4.0 to 12.1)	49.2 (38.8 to 59.8)
1–3 child	24.7 (17.9 to 33.2)	24.1 (17.3 to 32.5)	4.8 (1.9 to 12.0)	44.6 (33.3 to 56.6)
> 3 child	14.0 (9.3 to 20.5)	13.5 (9.1 to 19.7)	1.5 (0.8 to 3.0)	27.2 (14.8 to 44.6)
Education level				
Certificate	15.6 (9.9 to 23.7)	15.2 (9.6 to 23.1)	2.1 (0.7 to 5.9)	48.9 (29.6 to 68.6)
Diploma	26.0 (19.3 to 34.0)	25.5 (18.7 to 33.6)	5.1 (2.5 to 9.9)	40.0 (32.6 to 47.9)
Degree and above	35.9 (24.5 to 49.0)	35.9 (24.6 to 49.0)	5.1 (1.7 to 14.7)	37.1 (23.8 to 52.7)
Household income				
B40	29.5 (20.7 to 40.1)	29.0 (20.7 to 39.0)	6.5 (3.2 to 12.8)	44.5 (36.8 to 52.4)
M40	22.3 (16.2 to 29.9)	21.7 (15.5 to 29.6)	3.8 (1.6 to 8.4)	35.5 (27.0 to 45.0)
T20	28.6 (15.3 to 47.0)	28.6 (15.3 to 47.0)	1.8 (0.6 to 5.2)	32.6 (22.9 to 44.1)
Level of healthcare				
Hospital	25.8 (16.6 to 37.7)	25.2 (16.2 to 37.1)	5.0 (2.1 to 11.6)	45.3 (41.3 to 49.3)
Primary care	19.3 (14.4 to 25.3)	18.9 (13.8 to 25.4)	2.7 (1.6 to 4.7)	27.9 (21.0 to 35.9)
Year of service				
1–5	34.2 (22.9 to 47.7)	33.4 (22.9 to 45.8)	8.7 (4.3 to 16.7)	48.3 (38.3 to 58.4)
6–10	29.5 (22.5 to 37.6)	28.8 (22.1,36.5)	5.7 (2.4 to 12.8)	41.4 (34.1 to 49.1)
>10	19.8 (15.1 to 25.4)	19.5 (14.9 to 25.0)	2.7 (1.4 to 5.2)	42.2 (29.7 to 55.9)
Time spent on clinical activities				
>50%	22.5 (15.2 to 32.1)	21.9 (14.6 to 31.6)	4.5 (2.4 to 8.3)	41.2 (34.3 to 48.7)
<50%	28.2 (22.1 to 35.3)	27.9 (22.1 to 34.5)	4.6 (1.5 to 13.1)	41.7 (33.5 to 50.5)
Shift work				

Continued

Table 2 Continued

Prevalence rate	Overall burnout (95% CI)	High EE (95% CI)	High DP (95% CI)	Low PA (95% CI)
No	20.7 (15.5 to 27.1)	19.9 (14.3 to 26.9)	3.7 (1.9 to 7.3)	40.2 (22.7 to 60.6)
Yes	27.1 (18.2 to 8.3)	26.8 (18.1 to 37.8)	5.1 (2.3 to 11.0)	42.2 (31.9 to 53.3)
Total number of shifts per month				
>24x	27.2 (15.4 to 43.5)	26.9 (15.3 to 42.8)	3.2 (0.8 to 11.7)	34.3 (18.9 to 53.8)
<24x	27.5 (19.5 to 37.1)	27.3 (19.3 to 37.0)	7.1 (3.7 to 13.5)	50.9 (43.3 to 58.4)
Total number of night shifts per month				
>6x	33.9 (23.6 to 46.1)	33.8 (23.5 to 46.0)	8.2 (4.4 to 14.9)	44.6 (38.3 to 51.1)
1–6x	22.9 (14.8 to 33.6)	22.5 (14.7 to 32.9)	2.9 (0.7 to 11.6)	40.2 (27.9 to 54.0)
Total number of double shifts per month				
>5x	35.5 (24.0 to 48.8)	35.5 (24.0 to 48.8)	9.4 (3.3 to 24.4)	41.2 (18.0 to 69.0)
1–4x	32.3 (22.3 to 44.2)	31.7 (22.1 to 43.2)	7.2 (3.7 to 13.7)	43.4 (33.3 to 54.1)
Total number of on-call/extended hours per month				
1–3x	18.0 (7.8 to 36.0)	16.6 (6.0 to 38.4)	2.6 (0.8 to 8.4)	49.7 (19.6 to 79.9)
4–6x	20.3 (14.1 to 28.4)	20.3 (14.1 to 28.4)	5.8 (2.5 to 12.7)	28.2 (13.9 to 49.0)
>7x	24.4 (17.1 to 33.7)	23.5 (16.3 to 32.6)	3.1 (1.2 to 7.5)	31.2 (20.5 to 44.5)
Sleeping hours				
<6 hours	35.7 (29.7 to 42.2)	35.5 (29.6 to 41.8)	7.5 (4.8 to 11.6)	44.7 (36.3 to 53.4)
6–7 hours	20.7 (13.2 to 31.0)	20.0 (12.6 to 30.3)	3.6 (1.3 to 9.1)	42.0 (35.9 to 48.4)
>7 hours	17.0 (12.8 to 22.1)	16.5 (12.2 to 22.0)	2.9 (0.9 to 9.5)	35.4 (21.6 to 52.2)
Encountered traumatic events at work				
Yes	39.9 (29.9 to 50.8)	38.9 (28.4 to 50.5)	9.7 (7.7 to 12.2)	43.9 (31.7 to 56.9)
No	18.5 (12.8 to 26.0)	18.2 (12.7 to 25.5)	2.5 (0.6 to 9.4)	40.8 (32.1 to 50.1)
Received debriefing/psychological support for post- traumatic event				
Yes	19.5 (7.3 to 42.8)	19.8 (6.8 to 45.7)	3.6 (1.1 to 11.3)	33.4 (11.2 to 55.5)
No	36.8 (24.1 to 51.7)	49.6 (40.0 to 59.2)	13.3 (8.2 to 20.8)	50.0 (39.1 to 60.9)
Travelling time to the workplace				
>30 min	30.6 (17.5 to 47.8)	29.9 (17.1 to 46.8)	5.5 (2.1 to 13.6)	59.9 (40.9 to 76.4)
16–30 min	25.0 (16.1 to 36.9)	24.7 (16.1 to 35.9)	5.4 (2.2 to 12.7)	42.2 (30.2 to 55.2)
<15 min	21.7 (16.8 to 27.5)	21.1 (15.9 to 27.6)	3.5 (1.7 to 7.0)	34.3 (27.9 to 41.5)

95% CI 30.1 to 40.8) nurses recorded a higher prevalence of burnout. Burnout level was the lowest among nurses from M40 households (22.3, 95% CI 16.2 to 29.9) as compared with B40 and T20 groups. Hospital

nurses reported a higher level of burnout than their counterparts in primary care facilities. Furthermore, nurses who were less involved in clinical activities experienced a higher level of burnout (28.2, 95% CI 22.1 to

Table 3 Influences of different coping strategies on domains of emotional exhaustion, depersonalisation and personal accomplishment under burnout syndrome through analysis of the slope of the regression line

Coping strategies (Brief COPE)	Emotional exhaustion B (r ²)	Depersonalisation B (r ²)	Personal accomplishment B (r ²)
Problem focused			
Active coping	1.041 (0.02)	-0.032 (0.00)	2.418 (0.17)**
Planning	0.562 (0.00)	-0.083 (0.00)	2.557 (0.18)**
Use of instrumental support	1.408 (0.04)	0.269 (0.01)	0.614 (0.01)
Emotion focused			
Use of emotional support	1.803 (0.07)*	0.331 (0.02)**	0.737 (0.02)
Positive reframing	0.385 (0.00)	-0.218 (0.01)	2.224 (0.13)**
Acceptance	1.500 (0.04)	0.237 (0.01)	1.570 (0.09)
Religion	-0.470 (0.00)	-0.290 (0.01)*	1.381 (0.04)**
Humour	2.455 (0.07)**	0.843 (0.07)***	-0.436 (0.00)
Dysfunctional			
Venting	3.771 (0.18)**	0.944 (0.09)**	-0.812 (0.02)
Denial	1.807 (0.04)	0.938 (0.09)***	-1.124 (0.00)
Substance use	2.652 (0.01)**	0.973 (0.01)*	-1.127 (0.00)*
Behavioural disengagement	4.350 (0.18)***	1.293 (0.13)***	-2.000 (0.07)***
Self-distraction	2.428 (0.13)**	0.396 (0.03)**	0.885 (0.03)
Self-blame	1.702 (0.04)	0.698 (0.06)*	-1.602 (0.07)**

B denotes β -coefficient, and r² denotes the coefficient of determination.
*P<0.05; **p<0.01; ***p<0.001.

35.3). Shift work and after-office hour duties also led to a higher prevalence of burnout. Our study showed a 7% higher prevalence of burnout among nurses who performed shift work (shift workers: 27.1%, 95% CI 18.2 to 38.3; non-shift workers: 20.7% 95% CI 15.5 to 27.1). In addition, nurses who performed on calls or extended hours more than seven times a month reported a higher prevalence of burnout (24.4, 95% CI 17.1 to 33.7). Among those who experienced a traumatic event at work, 39.9% (95% CI 29.9 to 50.8) suffered from burnout. A higher prevalence of burnout (36.8%) was observed among nurses who did not receive any debriefing post-traumatic events (95% CI 24.1 to 51.7).

Based on the results, problem-focused coping strategies were positively related to the PA domain in MBI. An increase of one-point in the scores of active coping and planning led to a 2.4 and 2.6 points increase in the score of PA. In contrast, dysfunctional coping strategies were negatively related to PA. A one-point increase in the score of substance use, self-blame and behavioural disengagement resulted in 1.1, 1.6 and 2.0 points reduction in the PA score. Most of the significant predictors that led to higher scores under the domains of EE and DP were dysfunctional coping strategies (table 3).

Table 4 shows the association between baseline variables and the risk of burnout using univariate logistic regression. Age group, number of children, education level and years of service were closely associated with the development of burnout and its subdomains. A higher number of

shifts, double shifts and night shifts per month, as well as sleep deprivation (<6 hours per night), were significantly associated with burnout (p<0.05).

All variables with p<0.25 at the univariate level were included in the multivariate logistic regression to determine the predictors for burnout among the nurses (table 5). Based on the results, shift working nurses were 1.6 times more likely to develop burnout than their non-shift working counterparts. Those who performed more than six night shifts per month were more predisposed to experience overall burnout, high EE and high DP at 1.54 (95% CI 1.01 to 2.36; p<0.05), 1.55 (95% CI 1.44 to 1.67; p<0.001) and 2.52 (95% CI 2.18 to 2.90; p<0.001) times, respectively. In addition, sleep deprivation led to significantly higher levels of overall burnout and EE. Having less than 6 hours of sleep per day increased the prevalence of burnout and EE by 2.89 (95% CI 1.40 to 5.97; p<0.05) and 2.94 times (95% CI 1.36 to 6.38; p<0.05). While encountering traumatic events at work led to 4.19 times (95% CI 2.31 to 7.63; p<0.05) higher risk of overall burnout and 4.42 times higher risk of EE (95% CI 2.28 to 8.57; p<0.05), those who received psychological support or debriefing post-traumatic events were protected against burnout.

DISCUSSION

Burnout among HCW is a global phenomenon that can cast a profound negative impact on the personal well-being and organisational performance. This study was planned and executed back in 2019 in view of the lack

Table 4 Association between demographic and professional characteristics with burnout using univariate logistic regression

	Burnout		High EE		High DP		Low PA	
	Crude OR (95% CI)	P value	Crude OR (95% CI)	P value	Crude OR (95% CI)	P value	Crude OR (95% CI)	P value
Age group (years)								
21–30	3.04 (1.45 to 6.38)	0.010	3.02 (1.44 to 6.35)	0.011	5.67 (2.74 to 11.71)	0.001	1.53 (0.88 to 2.64)	0.108
31–40	1.74 (0.66 to 4.60)	0.211	1.69 (0.67 to 4.27)	0.217	2.91 (1.15 to 7.39)	0.031	1.13 (0.62 to 2.04)	0.634
>40	1		1		1		1	
Marital status								
Single	1.34 (0.60 to 2.98)	0.402	1.37 (0.64 to 2.96)	0.355	1.69 (0.46 to 6.21)	0.359	2.43 (0.79 to 7.50)	0.102
Married	1		1		1		1	
No. of children								
No child	3.36 (2.36 to 4.79)	<0.001	3.46 (2.47 to 4.83)	<0.001	4.83 (1.96 to 11.92)	0.005	2.60 (1.17 to 5.76)	0.026
1–3 child	2.02 (1.26 to 3.22)	0.011	2.03 (1.32 to 3.11)	0.007	3.25 (0.75 to 14.15)	0.098	2.16 (0.71 to 6.58)	0.141
>3 child	1		1		1		1	
Education level								
Degree and above	3.02 (1.61 to 5.67)	0.005	3.12 (1.65 to 5.90)	0.005	2.57 (1.23 to 5.36)	0.020	0.62 (0.29 to 1.28)	0.154
Diploma	1.89 (1.22 to 2.96)	0.012	1.91 (1.19 to 3.06)	0.015	2.55 (1.21 to 5.39)	0.022	0.69 (0.28 to 1.76)	0.376
Certificate	1		1		1		1	
Household income								
B 40	1.05 (0.38 to 2.89)	0.917	1.02 (0.37 to 2.81)	0.962	3.68 (1.89 to 7.15)	0.003	1.66 (0.90 to 3.05)	0.089
M 40	0.72 (0.30 to 1.70)	0.383	0.69 (0.29 to 1.65)	0.339	2.09 (1.17 to 3.71)	0.020	1.14 (0.55 to 2.36)	0.682
T 20	1		1		1		1	
Level of healthcare								
Hospital	1.46 (0.63 to 3.38)	0.308	1.45 (0.62 to 3.37)	0.324	1.86 (0.48 to 7.26)	0.307	2.14 (1.33 to 3.44)	0.008
Primary care	1		1		1		1	
Year of service (years)								
1–5	2.11 (1.49 to 2.99)	0.002	2.07 (1.51 to 2.84)	0.001	3.42 (2.09 to 5.57)	0.001	1.28 (0.66 to 2.49)	0.402
6–10	1.69 (1.04 to 2.78)	0.039	1.67 (1.07 to 2.60)	0.030	2.16 (1.29 to 3.62)	0.011	0.97 (0.56 to 1.67)	0.885
> 10	1		1		1		1	
Time spend on clinical activities								
>50%	0.74 (0.54 to 1.02)	0.062	0.73 (0.53 to 1.01)	0.053	0.97 (0.49 to 1.93)	0.908	0.98 (0.69 to 1.39)	0.887
<50%	1		1		1		1	
Shift work								
Yes	1.42 (0.95 to 2.13)	0.076	1.48 (0.99 to 2.24)	0.060	1.39 (0.83 to 2.34)	0.170	1.09 (0.33 to 3.54)	0.870
No	1		1		1		1	
Total number of shifts per month								
>24	1.11 (0.86 to 1.43)	0.417	0.98 (0.94 to 1.03)	0.394	0.43 (0.39 to 0.47)	<0.001	0.50 (0.48 to 0.52)	<0.001
<24	1		1		1		1	

Continued

Table 4 Continued

	Burnout		High EE		High DP		Low PA	
	Crude OR (95% CI)	P value	Crude OR (95% CI)	P value	Crude OR (95% CI)	P value	Crude OR (95% CI)	P value
Total number of night shifts per month								
>6	1.55 (1.18 to 2.02)	0.001	1.76 (1.68 to 1.84)	<0.001	2.99 (2.71 to 3.30)	<0.001	1.19 (1.15 to 1.25)	<0.001
1–6	1		1		1		1	
Total number of double shifts per month								
>5	1.15 (1.07 to 1.25)	<0.001	1.18 (1.09 to 1.28)	<0.001	1.34 (1.17 to 1.53)	<0.001	0.91 (0.85 to 0.99)	0.019
1–5	1		1		1		1	
Total number of on-call/extended hours per month								
>6	1.48 (0.41 to 5.26)	0.483	1.54 (0.35 to 6.73)	0.498	1.17 (0.19 to 7.26)	0.839	0.46 (0.12 to 1.76)	0.206
4–6	1.16 (0.36 to 3.74)	0.760	1.28 (0.33 to 4.96)	0.670	2.27 (0.49 to 10.46)	0.236	0.39 (0.14 to 1.15)	0.078
1–3	1		1		1		1	
Sleeping hours								
<6	2.72 (1.78 to 4.16)	0.001	2.78 (1.78 to 4.35)	0.001	2.72 (1.06 to 7.00)	0.041	1.47 (0.77 to 2.81)	0.191
6–7	1.28 (0.78 to 2.09)	0.270	1.27 (0.76 to 2.13)	0.307	1.23 (0.73 to 2.08)	0.367	1.32 (0.79 to 2.24)	0.245
>7	1		1		1		1	
Encountered traumatic event at work								
Yes	2.92 (2.24 to 3.81)	<0.001	2.85 (2.17 to 3.76)	<0.001	4.11 (1.24 to 13.7)	0.028	1.14 (0.55 to 2.35)	0.685
No	1		1		1		1	
Received debriefing/psychological support for post-traumatic event								
Yes	0.42 (0.11 to 1.62)	0.165	0.25 (0.06 to 1.05)	0.056	0.36 (0.08 to 1.58)	0.143	0.60 (0.15 to 2.41)	0.404
No	1		1		1		1	
Travelling time to the workplace								
>30min	1.59 (0.89 to 2.86)	0.100	1.59 (0.91 to 2.79)	0.091	1.61 (0.54 to 4.77)	0.329	2.86 (1.04 to 7.84)	0.044
16–30min	1.21 (0.79 to 1.85)	0.326	1.22 (0.80 to 1.86)	0.292	1.56 (1.01 to 2.41)	0.047	1.39 (0.85 to 2.30)	0.155
<15min	1		1		1		1	

The bold values are statistically significant.

DP, depersonalisation; EE, emotional exhaustion; PA, personal accomplishment.

of national-level data on the prevalence and common predictors of burnout among nurses in Malaysia. The results have now become important baseline data to compare the prepandemic and postpandemic levels of burnout among the nurses in Malaysia.

In this study, one in every four nurses experienced burnout. The prevalence of burnout (24.4%) was comparable to single-centred studies among nurses from a teaching hospital in Malaysia (27.3%)¹³ and Thailand (22.0%).¹⁹ However, it was half of the prevalence among nurses in Indonesia (48.8%).²⁰ In contrast, the pool prevalence of burnout globally was lower at 11.2% according to a systematic review²¹ and in Brazil (18.3%).²² While the actual prevalence of burnout is likely to be different

across countries and settings, the differences can also be attributed to the tools and classifications of burnout used in each published study.

With regard to the three domains of burnout, a high proportion of nurses in this study experienced low PA (41.6%) and high EE (23.9%), with a smaller percentage of them having high DP (4.5%). Similar results were reported among primary care providers in China, except for higher prevalence rates for each domain (low PA: 41.4%, high EE: 33.1%, high DP: 8.8%).²³ Malaysia recorded a slightly higher nurse-to-population ratio at 1:297²⁴ compared with the ratio of 1:250 recommended by the WHO.²⁵ A high nurse-to-patient ratio that indicated poor staffing and shortages of basic medical

Table 5 Association between sociodemographic and professional factors with burnout among nurses using multivariate logistic regression

	Burnout		High EE		High DP		Low PA	
	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Age group (years)								
21–30	0.94 (0.18 to 4.95)	0.930	1.04 (0.26 to 4.22)	0.942	0.07 (0.00 to 11.03)	0.240	2.10 (0.69 to 6.39)	0.154
31–40	0.78 (0.18 to 3.39)	0.699	0.73 (0.21 to 2.59)	0.570	4.13 (0.40 to 42.19)	0.178	2.23 (1.46 to 3.39)	0.003
> 40	1	1	1	1	1	1	1	1
Marital status								
Single							0.56 (0.24 to 1.32)	0.148
Married							1	
No. of children								
No child	2.13 (0.98 to 4.65)	0.055	2.19 (0.88 to 5.45)	0.081	0.45 (0.01 to 14.69)	0.585	1.55 (0.39 to 6.19)	0.470
1–3 child	1.57 (0.56 to 4.42)	0.328	1.42 (0.56 to 3.65)	0.395	7.53 (0.55 to 104.08)	0.105	0.91 (0.58 to 1.44)	0.645
> 3 child	1	1	1	1	1	1	1	1
Education level								
Degree and above	0.36 (0.04 to 2.97)	0.281	0.37 (0.04 to 3.69)	0.328	0.29 (0.05 to 1714.76)	0.727	0.35 (0.02 to 5.24)	0.378
Diploma	0.46 (0.09 to 2.54)	0.311	0.43 (0.07 to 2.48)	0.280	0.82 (0.00 to 280.84)	0.933	0.24 (0.03 to 2.02)	0.152
Certificate	1	1	1	1	1	1	1	1
Household income								
B 40					5.39 (0.04 to 840.39)	0.431	2.76 (0.87 to 8.76)	0.075
M 40					3.22 (0.00 to 3041.25)	0.679	2.68 (1.19 to 6.08)	0.025
T 20					1	1	1	1
Level of healthcare								
Hospital								
Primary care								
Year of service (years)								
1–5	0.69 (0.18 to 2.61)	0.514	0.49 (0.10 to 2.45)	0.324	80.67 (0.70 to 9256.64)	0.063		
6–10	0.92 (0.26 to 3.22)	0.881	0.76 (0.21 to 2.76)	0.617	4.52 (0.491 to 41.68)	0.141		

Continued

Table 5 Continued

	Burnout		High EE		High DP		Low PA	
	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
> 10	1		1		1		1	
Time spent on clinical activities								
>50%	0.91 (0.63 to 1.32)	0.568	0.85 (0.62 to 1.17)	0.265				
<50%	1		1					
Shift work								
Yes	1.56 (0.45 to 1.92)	0.023	1.16 (0.59 to 1.25)	0.360	1.85 (0.00 to 3817.23)	0.843		
No	1		1		1			
Total number of shifts per month								
>24					2.61 (2.27 to 3.01)	<0.001	2.28 (2.12 to 2.45)	<0.001
<24					1		1	
Total number of night shifts per month								
>6	1.54 (1.01 to 2.36)	0.045	1.55 (1.44 to 1.67)	<0.001	2.52 (2.18 to 2.90)	<0.001	1.04 (0.97 to 1.12)	0.240
1–6	1							
Total number of double shifts per month								
>5	0.86 (0.54 to 1.37)	0.522	0.94 (0.87 to 1.02)	0.154	1.04 (0.89 to 1.21)	0.660	1.86 (0.79 to 1.93)	<0.001
1–5	1		1		1		1	
Total number of on-call/extended hours per month								
>7					2.47 (0.08 to 73.03)	0.522	0.65 (0.41 to 1.03)	0.062
4–6					4.69 (0.14 to 163.22)	0.314	0.64 (0.23 to 1.81)	0.334
1–3					1		1	
Sleeping hours								
<6	2.89 (1.40 to 5.97)	0.011	2.94 (1.36 to 6.38)	0.014	1.81 (0.77 to 4.24)	0.140	1.59 (0.69 to 2.62)	0.064
6–7	1.62 (0.75 to 3.48)	0.176	1.43 (0.72 to 2.87)	0.252	1.24 (0.55 to 2.75)	0.543	1.28 (0.93 to 1.76)	0.110
>7	1		1		1		1	
Encountered traumatic event at work								
Yes	4.19 (2.31 to 7.63)	0.001	4.42 (2.28 to 8.57)	0.002	2.99 (0.98 to 9.07)	0.053		

Continued

Table 5 Continued

	Burnout		High EE		High DP		Low PA	
	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
No	1		1		1			
Received debriefing/psychological support for post-traumatic event								
Yes	0.47 (0.28 to 0.79)	0.013	0.49 (0.28 to 0.88)	0.025	0.21 (0.01 to 3817.23)	0.201		
No	1		1		1			
Travelling time to the workplace								
>30min	3.55 (0.69 to 18.09)	0.106	3.95 (0.88 to 17.78)	0.067	0.13 (0.01 to 2.06)	0.115	2.24 (1.18 to 4.23)	0.021
16–30 min	1.38 (0.45 to 4.23)	0.509	1.44 (0.58 to 3.62)	0.368	0.94 (0.14 to 6.24)	0.938	1.05 (0.29 to 3.76)	0.928
<15min	1		1		1			

The bold values are statistically significant.
 DP, depersonalisation; EE, emotional exhaustion; PA, personal accomplishment.

equipment at work were significantly associated with the risk of developing EE.^{26 27} In addition, Yeun and Kim²⁸ described that supervisory support is vital in minimising EE by nurturing a sense of PA among the staff. In fact, this support is so essential that it has been linked with the retention of nurses. Apart from that, the sense of PA often heightens with higher levels of education. Studies from other countries that reported a lower prevalence of low PA consisted mostly of nurses who were degree or master holders.²⁹ In comparison, only 5.2% of our nurses were degree holders, thus likely attributed to the higher prevalence of low PA. Hence, one of the long-term strategies to enhance nurses' PA and reduce their burnout is by improving their access to further education to elevate their professional status.³⁰

In terms of age group, younger nurses reported a higher prevalence of burnout in this study. This is in line with previous studies from various countries.^{31–37} In addition, similar to other studies,^{13 32 38} years of working experience were also associated with burnout whereby junior nurses were more susceptible to burnout than their senior counterparts. This could be attributed to the fact that junior nurses have yet to master the nursing skills, thus requiring a longer period to complete their tasks. They might also lack resilience in managing occupational stress, a skill that is often acquired with longer years of work experience.^{33 38–40} With regard to the association between burnout with marital status and the number of children, there have been contradictory findings in the research. In this study, burnout was higher among nurses who were single. Some studies reported that single nurses tend to have less social and family support, thus predisposing them to burnout.^{39 41–43} Furthermore, in this study, a lower number of children was also a significant predictor of burnout. However, most of the published studies reported the opposite whereby nurses with children were associated with higher EE and decreased PA, likely due to the additional obligations and potential family–work conflicts.^{33 44 45} Recent studies have reported an association between smoking and alcohol use with burnout among healthcare professionals in other countries. However, disparities in the sociocultural norms, as well as tobacco and alcohol legislation, could explain the prevalence dissimilarity across countries. In this study, the prevalence of smoking and alcohol use was very low (<0.1%). According to the Malaysian National Health Morbidity Survey (NHMS), the ratio of Malaysian male to female smokers was 31:1. Furthermore, other ethnicities apart from Malays were more likely to be associated with alcohol consumption.⁴⁶ Given that nurses in Malaysia are predominantly female Malay Muslims, it is unsurprising to find a low prevalence of smokers and alcohol drinkers among our study population. Thus, both of these variables were excluded from further analysis.

Working schedule also plays a vital role in the development of burnout, especially among hospital nurses who need to perform shift duties. In this study, while the total number of shifts per month was not significantly linked



to the development of burnout, the number of night shifts was a significant predictor of overall burnout, high EE and high DP. Similarly, a higher number of double shifts led to low PA. Similar findings were noted among nurses in China and Thailand.^{19 37 47 48} Shift work rotation may disrupt the circadian rhythm and sleeping patterns of the involved staff. Previous research found that nurses on more rotational shifts or night shifts were more likely to suffer from negative physical and psychological health impacts.⁴⁹ Additionally, night shift workers commonly experience excessive daytime fatigue and somnolence that predispose them to higher risks EE and DP.⁵⁰ Despite these health hazards, the nature of shift work will be hard to modify as it is an integral part of the nursing profession to provide round-the-clock patient care. Therefore, it is vital to integrate important components such as sleep hygiene and psychosocial support into the nursing education curriculum to better equip young nurses in facing the impending challenges in their future careers.

Healthcare workers, especially doctors and nurses, are often exposed to highly stressful traumatic events such as witnessing deaths or injuries, dealing with patients with critical illnesses and managing the demands of patients' relatives. Often, nurses are expected to remain stoic and continue caring for the patients after these stressful situations, subsequently leading to the development of burnout. Debriefing or psychological support was proposed as one of the ways to reduce the incidence of burnout from post-traumatic events.⁵¹ This is evidenced by our study findings in which nurses who experienced traumatic events were less likely to develop burnout following debriefing or psychological support sessions. Debriefing, taking regular breaks and using stress reduction measures throughout shifts have been demonstrated to reduce the risk of burnout among nurses.⁵² However, only one-quarter of nurses who encountered traumatic events at work received debriefing in this study. In view of this, a structured debriefing system should be put in place in various health facilities to provide the necessary psychological support services to ensure the mental well-being of nurses and other HCWs alike.

In this study, we also evaluated the coping mechanisms applied by the nurses. Different coping strategies, be it problem focused, emotion focused, or dysfunctional mechanisms can have varying effects on personal emotions and work approaches. Problem-focused coping responses to distress reflect positive cognitive and behavioural efforts in resolving life stressors. Thus, it can be beneficial in dealing with stressors.⁵³ In a recent study, the use of emotion-focused and dysfunctional coping styles was linked to higher levels of EE, whereas problem-focused coping styles were linked to lower scores of DP and higher scores of PA.⁵⁴ In this study, the use of religion as an emotion-focused coping strategy showed a positive correlation with high PA and low DP. Similarly, in Pakistan⁵⁵ and Palestine,⁵⁶ praying and other religious activities were the highest ranked coping techniques practised by the HCW. Religious belief was shown to be

helpful for nurses to deal with challenges at work and maintaining the quality of healthcare.^{57 58} In contrast, the use of dysfunctional coping mechanism has been linked with mood disturbances and poor mental health.^{42 48} A high number of nurses relied on dysfunctional coping strategies such as behavioural disengagement and venting that led to a significant increase in the three domains of burnout. This echoed the findings of two other studies whereby dysfunctional coping was strongly linked to EE and DP.^{59 60}

Accordingly, one of the major practical implications of our research findings is that it provides much-needed empirical data on the actual prevalence of burnout on a national level. With one in four nurses experiencing burnout, more attention and resources are warranted to prevent a worsening of the problem. A second important contribution of our study revolves around the need to instil positive coping strategies, especially among at-risk nurses. An effective coping mechanism may reduce burnout among nurses as well as boost their productivity and quality of life.⁶¹ Therefore, organisation-driven interventions such as educational and training programmes aimed at improving nurses' coping skills should be implemented from an early stage to better prepare them in managing psychosocial stressors at work. Other organisational measures including multidisciplinary psychosocial support such as debriefing post-traumatic events and involvement of healthcare professionals in the creation, testing and assessment of prevention measures against burnout can also be considered to reduce burnout.^{51 62 63}

This was the first nationwide study in Malaysia to determine the prevalence of burnout using a complex sampling analysis with a large sample size representative of the nursing population in the public healthcare sector. The identified risk factors for burnout enable the policymakers and hospital managers to implement effective preventive initiatives that target the susceptible population. However, there are some limitations to this study. As this was a cross-sectional study, it was difficult to establish the link between the exposure and outcome as both are assessed at the same time. In addition, self-administered questionnaire was susceptible to recall bias and social desirability bias. In this study, we only focused on predictors of burnout from the individual perspective of nurses. With increasing evidence showing the roles of interpersonal and organisational stressors in the development of burnout, future research should consider longitudinal studies that encompass a wider range of variables to establish the predisposing factors of burnout at various levels.

CONCLUSION

In this study, one in four public nurses suffered from burnout in Malaysia. Younger, single and childless nurses recorded a higher level of burnout. Shift works, especially night shifts, significantly predisposed to burnout. As compared with problem-focused coping strategies that reduced burnout, dysfunctional coping strategies should

be discouraged as they led to higher levels of EE, DP and low PA. Following the 2-year battle with the COVID-19 pandemic, known and new stressors are likely intensified, predisposing nurses who are the main workforce of frontliners in the Malaysian health workforce to even higher levels of strain and burnout. Therefore, it is essential to implement the necessary preventive and promotive efforts among the high-risk vulnerable nurses identified in this study. Modifiable stressors must be addressed via inculcation of positive coping strategies to mitigate potential mental health impacts. Organisational reform in the form of system-level efforts to reinvent and innovate workflow, human resources and workplace wellness is critical to decreasing burnout among nurses.

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