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An empirical study of work-related stress and burnout among nurses

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Abstract: The increasing workload led to the increase in work-related stress among nurses. When job demands are high and work resources are limited, stress will eventually lead to burnout syndromes. The objectives of this study are to determine burnout levels and examine the relationships between work-related stresses and burnout among nurses in a public hospital in Malaysia. The data collected were analysed using descriptive statistics and multiple regression analysis to derive results for discussions. It was observed that 19 out of 316 respondents have burnout syndromes. The regression analysis results indicated that psychological stress and social stress have significant positive relationships with emotional exhaustion and depersonalisation. Social stress has a significant negative relationship with personal accomplishment. Nurses working on rotating shifts and earning a household income of less than RM4,850 per month are prone to burnout syndromes. Strategies are required to build a resilient team in fighting against burnout syndromes.

Keywords: work-related stress; burnout; nurses; public hospital.

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1 Introduction

The nursing profession is one of the most important healthcare professions that have direct involvement with patients' care and management. The ratio of nurses compared to other healthcare professions in hospitals is higher due to its job demand to provide healthcare services to the patients. For instance, a statistic shows that the doctor to population ratio is 1:632, while the nurse to population ratio is 1:308 in the country (Ministry of Economic Affairs Malaysia, 2017). However, based on the recommendation from the World Health Organisation, Malaysia needs 130,000 nurses by 2020 for a nurse to population ratio of 1:200. Heavy workload in hospitals is generally caused by the increasing number of admitted patients in the emergency and trauma department, wards, and outpatient department in specialist clinics. In particular, the COVID-19 outbreak has raised the demand for nurses tremendously due to the sudden surge of patients. Apart from that, Malaysia was also reported to have the highest prevalence of non-communicable diseases among ASEAN countries (Medical Development Division, 2020). The increasing workload to combat both communicable and non-communicable diseases is one of the challenges faced by healthcare providers in the country. This scenario could lead to the increase in work-related stress among nurses. For many years, workload, leadership, management style, professional dispute, and emotional work climate have been the major sources of distress among nurses (McVicar, 2003). According to Ayub et al. (2008), work-related stress could develop when job demands are high and work resources are limited. This work-related stress will eventually result in burnout syndromes. This study intends to measure the burnout levels among nurses to guide the hospital management in identifying specific groups of nurses with burnout syndromes and deploy strategies to overcome the situation. Besides, this study also contributes to the body of knowledge by examining the relationship between work-related stress and burnout in the Malaysian healthcare context. Although there were research conducted in the past like those by Rayan et al. (2019) and Liao et al. (2019), there is still a lack of studies on work-related stress and the dimensions of burnout among nurses in public hospitals in Malaysia. Therefore, this research raises the following research questions:

1 What is the level of burnout among the nurses?

2 What is the relationship between work-related stress and burnout?

3 What are the strategies that can reduce the incidence of burnout?

2 Literature review and hypothesis development

2.1 Burnout

Burnout is a psychological disorder emerging as a chronic reaction to persistent stressful working conditions (Maslach and Leiter, 2016). The three main aspects of this reaction are emotional exhaustion, depersonalisation, and personal accomplishment. Burnout is a condition of social, physiological, and psychological stress response triggered by long-term exposure to extreme emotional and interpersonal work-related pressure (Biksegn et al., 2016). Numerous healthcare providers face multiple stressors in their daily works and are constantly exposed to adverse conditions (Arrogante and Aparicio-Zaldivar, 2017). Work demands generally cause burnout by demanding significant physical and emotional efforts. According to Khamisa et al. (2015), the nature of nurse duties contributed to higher incidence of burnout compared to that of other medical providers. Furthermore, the nursing profession demands sympathy, empathy, sensitivity to culture, and professional and ethical healthcare in a limited resource working environment and expanded responsibilities. A few studies have reported that the incident of burnout was higher in nurses compared to other medical professions (Biksegn et al., 2016; Ganing et al., 2020). In Malaysia, it was found that burnout is common among nurses, especially those working in the emergency department (Zakaria et al., 2021). According to Atefi et al. (2016), Malaysia has an inadequate number of nurses like many other nations due to rapidly aging population and the increase of chronic diseases. This situation has led to the imbalance number of nursing staff with increasing workload and ultimately causes burnout among nurses in the country. Burnout is a dynamic phenomenon undoubtedly affected by several stressors in the form of social, psychological, and environmental situations. Hence, this study intends to determine the burnout levels among nurses according to their demographic profiles before examining the relationships between work-related stress and burnout dimensions.

2.2 Work-related stress

Stress is understood as a combination of physiological processes having a defensive function that an individual utilises to react to unfavourable factors (Cotrau et al., 2019). Based on previous studies, factors that contribute to stress among nursing staff can be divided into three main groups, namely, organisational stressors, work-related stress, and intrapersonal stressors (Abu Al Rub, 2000). Most researchers conducted their research on work-related stresses that highly contribute to burnout and affect the general health condition of employees (Khamisa et al., 2015). In this research, work-related stresses were used as the determinants of burnout. They can be categorised into physical, psychological, and social stress (Pérez-Fuentes et al., 2019). According to Michie (2002), physical stress refers to aversive physical working environments, bad workplace ergonomics, and accidents that induce stress. If excessive burden in the workplace is persistent, there is minimal hope of relaxation, rehabilitation, and restoration of equilibrium (Maslach and Leiter, 2016). Psychological stress is defined as a psychological condition that occurs when an individual's resources are insufficient to cope with the situational demands and pressures (Michie, 2002). Working as nurses in hospitals requires good communication with patients, relatives, and colleagues to update

issues related to patients' care (Aishah and Ruslan, 2020). Social stress is related to a form of stress due to the social environment. It is caused by issues of developing and maintaining relationships with others in the work environment (Wood and Bhatnagar, 2015). In Malaysia, a study conducted among nurses in healthcare facilities revealed that demographic profiles, work-related stress, and social support are significantly related to burnout among nurses (Jannah and Perveen, 2021). This study indicated that those with higher burnout levels are exposed to stress and poor relationship in the workplace. Hence, recognising and resolving burnout symptoms and risk factors in the workplace can improve the motivation and satisfaction of the nurses. The costs of burnout are high in terms of loss of manpower, knowledge, time, and energy. It is difficult for a hospital to maintain its operation under these circumstances.

2.3 Physical stress and emotional exhaustion

Persistent physical components of the working environment that require continuous physical activities or workload could contribute to psychological effects such as emotional exhaustion (Bakker et al., 2004). A study conducted among nurses in Greece who worked with psychiatric patients found that emotional exhaustion was predicted by workload (Konstantinou et al., 2018). Another study conducted among nurses working in a transplant unit found that weekly increased working hours were one of the significant predictors of emotional exhaustion (Jesse et al., 2014). Several studies supported this finding which found that physical stress is one of the predictors of emotional exhaustion (Bottini et al., 2020; Newman et al., 2020; Uziel et al., 2019). Based on the above discussion, it is hypothesised that:

H1a There is a significant positive relationship between physical stress and emotional exhaustion.

2.4 Physical stress and depersonalisation

Previous studies revealed that there were associations between physical stress particularly workload on depersonalisation. A study conducted among healthcare providers working in critical care found that depersonalisation was positively associated with workload (Elshaer et al., 2018). Another study also found that physical stress significantly predicted depersonalisation among nurses taking care of patients suffering from the human immunodeficiency virus (Roomaney et al., 2017). In addition, a study conducted among nurses working with psychiatric patients revealed that physical workload has a positive relationship with depersonalisation (Newman et al., 2020). Apart from that, depersonalisation was also found to be linked with role overload (Luo et al., 2016). Hence, we hypothesise that:

H1b There is a significant positive relationship between physical stress and depersonalisation.

2.5 Physical stress and personal accomplishment

There are a few studies that found physical stress has significant effects on personal accomplishment. A study conducted among nursing staff working in the obstetrics and gynaecology unit found that personal accomplishment was negatively predicted by

physical stress (Banovcinova and Baskova, 2014). This study was also supported by another study which discovered that job satisfaction with workload was the strongest predictor of personal accomplishment (Konstantinou et al., 2018). Therefore, based on the above literature review, most findings supported that there is a significant negative effect of physical stress on personal accomplishment. Thus, it is hypothesised that:

H1c There is a significant negative relationship between physical stress and personal accomplishment.

2.6 Psychological stress and emotional exhaustion

Psychological stress refers to a psychological condition that occurs when an individual's resources are insufficient to cope with the situation's demands and pressures (Michie, 2002). A study conducted among oncology nurses found that dealing with death is one example of psychological stress that predicts emotional exhaustion (Guo and Zheng, 2019). Besides, it was found that greater psychological stress significantly predicts emotional exhaustion among nurses working in transplant units (Jesse et al., 2014). This finding was also supported by a study which was conducted among doctors working in pain management units and revealed that emotional exhaustion was significantly predicted by psychological stress (Kroll et al., 2016). Therefore, it is hypothesised that:

H2a There is a significant positive relationship between psychological stress and emotional exhaustion.

2.7 Psychological stress and depersonalisation

Past studies revealed that there is a significant effect of psychological stress on depersonalisation. A study conducted among nurses in a hospital discovered that death and dying are determinants of depersonalisation (Gama et al., 2014). Depersonalisation was also predicted by psychological stress on nurses working in transplant services (Jesse et al., 2014). Apart from that, those working with psychiatric patients revealed that depersonalisation was positively linked with psychological stress such as treatment uncertainty of patients (Newman et al., 2020). Based on the above discussion, we hypothesise that:

H2b There is a significant positive relationship between psychological stress and depersonalisation.

2.8 Psychological stress and personal accomplishment

Psychological stress negatively influences personal accomplishment among nurses and doctors who provide oncology services in hospitals (Guo and Zheng, 2019). This is obvious, especially in dealing with death and working on pain management (Kroll et al., 2016). Prolonged exposure to psychological stress among nurses predisposes them to burnout which is defined as a sustained reaction to chronic, interpersonal, and emotional stressors at work. Eventually, it will negatively influence personal accomplishment (Maslach, 2003). Hence, it is hypothesised that:

H2c There is a significant negative relationship between psychological stress and personal accomplishment.

2.9 Social stress and emotional exhaustion

A study conducted among doctors providing paediatric services in Malaysia found that emotional exhaustion was significantly predicted by social stress, (i.e., interpersonal relationships with co-workers and supervisors) (Khoo et al., 2017). This finding was supported by a study that revealed that relationships with supervisors had a significant effect on emotional exhaustion (Lahana et al., 2017). In addition, another study conducted among nursing staff discovered that emotional exhaustion was significantly linked with the social relationships among physicians, supervisors and colleagues (Banovcinova and Baskova, 2014). Apart from that, a study in non-medical professions also indicated that emotional exhaustion has a significant association with social interpersonal relationships (Mao et al., 2020). Thus, it is hypothesised that:

H3a There is a significant positive relationship between social stress and emotional exhaustion.

2.10 Social stress and depersonalisation

A study by Elshaer et al. (2018) found that depersonalisation was significantly predicted by social stress among healthcare providers in critical care. This finding was concurred by another study which revealed that relationships with supervisors have a significant relationship with depersonalisation (Lahana et al., 2017). In addition, high depersonalisation was also found to be associated with high social stress (Luo et al., 2016). Nevertheless, the relationship between dentist-assistant was found to be one of the strongest predictors of depersonalisation (Uziel et al., 2019). Therefore, we hypothesise that:

H3b There is a significant positive relationship between social stress and depersonalisation.

2.11 Social stress and personal accomplishment

Several studies were conducted and found that there is a significant negative relationship between social stress and personal accomplishment. Intergroup conflict has a negative association with personal accomplishment (Elshaer et al., 2018). Further, another study found that personal accomplishment has a negative relationship with conflict among physicians and colleagues (Banovcinova and Baskova, 2014). Difficulty in interacting with patients was also discovered to be a significant predictor of personal accomplishment (El-Sherbiny, 2017). Therefore, based on the above literature review, it is hypothesised that:

H3c There is a significant negative relationship between social stress and personal accomplishment.

3 Research methodology

3.1 Research design and participants

A cross-sectional quantitative method was used in this research. The study site in this research is a 1,206 bedded public tertiary hospital in West Malaysia. Our study population were all the 1,717 registered nurses in permanent staff positions working in this hospital. Nurses who had prior history of psychiatric illness were excluded from this study. According to the sampling table provided by Saunders et al. (2007), the minimum sample size for this study is 314 at a confidence level of 95%. The researcher used a simple random sampling technique to select the respondents according to the e-directory provided by the human resource unit. This sampling technique is chosen because it provides equal opportunity for each nursing staff to participate in the study and to avoid any preference of selecting respondents from the sample group (Saunders et al., 2007).

3.2 Research instruments

Research instruments used for the study variables were adapted from previous studies. Data regarding work-related stress was collected using the nursing stress scale, the Malay language version by Rosnawati et al. (2010). It consists of 34 items including physical stress (six items), psychological stress (18 items), and social stress (ten items). Each item was measured using a Likert scale from 0 to 3, where 0 = never, 1 = occasionally, 2 = frequently, and 3 = very frequently.

The Maslach burnout inventory-human services survey (MBI-HSS), Malay language version, was also used to measure burnout. It consists of 22 items measuring three dimensions of burnout, namely, emotional exhaustion (nine items), depersonalisation (five items), and personal accomplishment (eight items) (Maslach and Jackson, 1981). These items were measured using a Likert scale from 0 to 6, where 0 = never, 1 = a few times a year or less, 2 = once a month or less, 3 = a few times per month, 4 = once a week, 5 = a few times per week, and 6 = every day. High scores of the subscales of Maslach burnout level such as emotional exhaustion (≥ 27) and depersonalisation (≥ 10) and low score of personal accomplishment (≤ 33) indicate burnout syndromes.

3.3 Data collection procedure

Data collection is important to achieve the main objectives of the study and to ensure the integrity of the research. Data collection was conducted between January 2021 and June 2021 in the study site. A simple random sampling allows us to pick the sample from the sampling frame randomly using either a computer or random number tables (Saunders et al., 2007). The survey questionnaires were then distributed by the matrons to the respondents based on an e-directory provided by the human resource unit. A computer assists the researcher to draw the samples randomly from the e-directory. Completed questionnaires were then put in envelopes and sealed to ensure the confidentiality of the responses. There was no direct contact between the researcher and participants. The researcher collected the envelopes from the matrons after a week. The survey activity yielded 316 usable responses.

3.4 Data analysis

The data were analysed using SPSS statistics. Descriptive analysis was employed to determine the levels of burnout concerning the nurses' demographic profiles. Factor analysis and reliability tests were used to validate the dimensions of the study variables for inferential analysis. Multiple regression analysis was applied to test the relationship between work-related stress and burnout and derive results for discussions.

3.5 Ethical considerations

This research was approved by the Medical Research and Ethics Committee, Ministry of Health Malaysia (NMRR-20-2090-52492 (IIR)). This survey was conducted anonymously and the respondents were assured that all information provided to the researchers would remain confidential. Participation in the survey was voluntary and the respondents could withdraw from the survey at any time.

4 Results

4.1 Profiles of the respondents

A total of 316 nurses participated in this survey (14 males, 302 females). The nurses' age group of 26–35 years old (n = 189, 57.9%) reported the highest number of respondents, followed by the age group of 36–45 years old (n = 92, 29.1%), 46–55 years old (n = 24, 7.6%), below 25 years old (n = 11, 3.5%), and 56 years old and above (n = 6, 1.9%). The majority of the respondents (n = 123, 38.9%) have less than five years of working experience, whereas only 11 (3.5%) nurses have worked for more than 21 years. In terms of department, most nurses are working in the surgical-based disciplines (n = 132, 41.8%), followed by the woman and child directorate (n = 87, 27.5%), medical-based disciplines (n = 75, 23.7%), multidiscipline (n = 12, 3.8%), clinical support (n = 7, 2.3%), and nursing unit (n = 3, 0.9%). From the household income category, most of the nurses (n = 170, 53.8%) are having a household income of RM4,851–RM10,970 per month (M40), whereas 139 (44%) of them belong to the B40 income group (≤ RM4,850 per month), and only seven nurses (2.2%) are earning a household income of more than RM10,970 per month (T20). Most of the nurses (n = 267, 84.5%) are working on rotating shifts, while the rest of them (n = 49, 15.5%) are on fixed shifts. The complete information about nurses' demographic profiles is shown in Table 1.

4.2 Categories of nurses with burnout syndromes

According to Table 2, the subscales of Maslach burnout level indicate that 19 out of the total respondents (n = 316) have burnout syndromes. In terms of burnout syndromes by the participants' age, it was found that 17 (89.5%) of them are from 26 to 35 years old and 2 (10.5%) are between 36 and 45 years old. Regarding their work experience, 15 (78.9%) participants who have worked for 6 to 10 years were diagnosed with burnout syndromes, whereas 4 (21.1%) participants from categories of below 5 years and 11 to 15 years presented burnout syndromes. 12 (63.2%) nurses who have burnout syndromes were from the surgical-based disciplines, and the other 7 (36.8%) were from the

medical-based disciplines. Concerning their household income, 12 (63.2%) were from the group with a household income of less than RM4,850 per month (B40), whereas 7 (36.8%) respondents who earn RM4,851–RM10,970 per month (M40) have burnout syndromes. All 19 nurses who were diagnosed with burnout syndromes are working on rotating shifts.

Table 1 Demographic profiles of the nurses

Category	*Frequency (n)*	*Percentage (%)*
Gender:		
Male	14	4.4
Female	302	95.6
Age:		
≤ 25	11	3.5
26–35	183	57.9
36–45	92	29.1
46–55	24	7.6
≥ 56	6	1.9
Work experience:		
≤ 5 years	123	38.9
6 to 10 years	113	35.8
11 to 15 years	49	15.5
16 to 20 years	20	6.3
≥ 21 years	11	3.5
Department:		
Medical-based disciplines	75	23.7
Surgical-based disciplines	132	41.8
Woman and child directorate	87	27.5
Multidiscipline	12	3.8
Nursing unit	3	0.9
Clinical support	7	2.3
Household income (per month):		
< RM4,850	139	44
RM4,850–RM10,970	170	53.8
> RM10,970	7	2.2
Work shift:		
Rotating shift	267	84.5
Fixed shift	49	15.5

Table 2 Categories of nurses with burnout syndromes

Category	*Frequency (n)*	*Percentage (%)*
Age:		
26–35	17	89.5
36–45	2	10.5
Work experience:		
6–10 years	15	78.9
11–15 years	4	21.1
Department:		
Surgical-based disciplines	12	63.2
Medical-based disciplines	7	36.8
Hosusehold income:		
< RM4,850	12	63.2
RM4,850–RM10,970	7	36.8
Work shift:		
Rotating shift	19	100
Fixed shift	0	0

Table 3 Factor analysis and reliability test

Factorability assessment		*Burnout*	*Work-related stress*
Kaiser-Meyer-Olkin (KMO)	Measure of sampling adequacy	0.875	0.847
Bartlett's test of sphericity	Approx. Chi-square	2,319.713	910.3723
	df	120	55
	Sig.	0.000	0.000

Items (Burnout)	*Factor loading*		
	1	*2*	*3*
EE1	0.827		
EE2	0.861		
EE3	0.840		
EE4	0.852		
EE5	0.516		
EE6	0.693		
DP1			0.818
DP2			0.829
PA1		0.614	
PA2		0.695	
PA3		0.630	
PA4		0.654	

Note: EE = Emotional exhaustion; DP = Depersonalisation; PA = Personal accomplishment; PSYS = Psychological stress; SOS = social stress.

Table 3 Factor analysis and reliability test (continued)

Items (Burnout)	*Factor loading*		
	1	*2*	*3*
PA5		0.790	
PA6		0.788	
PA7		0.685	
PA8		0.573	
Eigenvalue	4.986	3.529	1.159
% of variance	31.162	22.054	7.246
Cumulative %	31.162	53.216	60.462
Cronbach's alpha	0.874	0.835	0.735
Items (Work-related stress)	*Factor loading*		
	1		*2*
SOS1			0.725
SOS2			0.764
SOS3			0.708
SOS4			0.780
PSY1	0.354		
PSY2	0.743		
PSY3	0.419		
PSY4	0.734		
PSY5	0.552		
PSY6	0.700		
PSY7	0.647		
Eigenvalue	4.030		1.294
% of Variance	36.636		11.766
Cumulative %	36.636		48.402
Cronbach's alpha	0.746		0.781

Note: EE = Emotional exhaustion; DP = Depersonalisation; PA = Personal accomplishment; PSYS = Psychological stress; SOS = social stress.

4.3 Factor analysis and reliability test

The principal component analysis (PCA) has been selected to conduct factor analysis before inferential analysis. According to Table 3, the values of Kaiser-Meyer-Olkin (KMO) obtained for burnout and work-related stress were 0.875 and 0.847 respectively. Both results were greater than 0.7 and considered adequate for this research. Besides, Bartlett's test of sphericity was significant at the $p < 0.05$ level for both study variables, indicating that the factorability of the correlation matrix was supported. The PCA with rotated component matrix analysis has extracted three factors of burnout – emotional exhaustion (six items, $\alpha = 0.874$), depersonalisation (two items, $\alpha = 0.735$), personal accomplishment (eight items, $\alpha = 0.835$). The rotated factors have recorded a cumulative percentage of 60.46 of the variance with eigenvalues of 4.986, 3.529, and 1.159

respectively. However, two factors of work-related stress – psychological stress (seven items, $\alpha = 0.746$) and social stress (four items, $\alpha = 0.781$) were extracted after loading values of below 0.35 were discarded. The dimension of physical stress has been eliminated from the factor analysis due to cross-loadings. The rotated factors have reported a cumulative percentage of 48.40 with eigenvalues of above 1.0. The reliability coefficients (Cronbach's alpha) for all dimensions of the variables have exceeded 0.7 and are deemed reliable for subsequent inferential analysis.

Table 4 Multiple regression analysis between work-related stress and the dimensions of burnout

Model 1	*Dependent variable: emotional exhaustion (EE)*				
IV: PSYS, SOS	*Unstandardised coefficients Std. error*		*Standardised coefficients*	*t*	*Sig.*
	B	*Std. error*	*Beta*		
(Constant)	0.843	0.120		7.034	0.000
PSYS	1.091	0.169	0.335**	6.474	0.000
SOS	0.982	0.134	0.379**	7.325	0.000
F value	99.443				
Sig.	0.000				
R^2	0.623				
Model 2	*Dependent variable: depersonalisation (DP)*				
IV: PSYS, SOS	*Unstandardised coefficients Std. error*		*Standardised coefficients*	*t*	*Sig.*
	B	*Std. error*	*Beta*		
(Constant)	–0.121	0.112		–1.084	0.279
PSYS	0.741	0.157	0.286**	4.709	0.000
SOS	0.338	0.125	0.164**	2.703	0.007
F value	29.067				
Sig.	0.000				
R^2	0.397				
Model 3	*Dependent variable: personal accomplishment (PA)*				
IV: PSYS, SOS	*Unstandardised coefficients Std. error*		*Standardised coefficients*	*t*	*Sig.*
	B	*Std. error*	*Beta*		
(Constant)	1.324	0.135		9.829	0.000
PSYS	–0.320	0.189	–0.108	–1.688	0.092
SOS	–0.394	0.151	–0.168**	–2.613	0.009
F value	9.790				
Sig.	0.000				
R^2	0.243				

Note: **significant at the 0.01 level (2-tailed); EE = Emotional exhaustion; DP = Depersonalisation; PA = Personal accomplishment; PSYS = Psychological stress; SOS = Social stress.

4.4 Multiple regression analysis

Table 4 displays the results of the multiple regression analysis between psychological stress, social stress, and dimensions of burnout (i.e., emotional exhaustion, depersonalisation, personal accomplishment). Model 1 shows that psychological stress ($\beta = 0.335$, $p < 0.01$) and social stress ($\beta = 0.379$, $p < 0.01$) have significant positive relationships with emotional exhaustion. The model indicates that 62.3% ($R^2 = 0.623$) of the variance of emotional exhaustion can be explained by the predictors. Next, in model 2, it was found that psychological stress ($\beta = 0.286$, $p < 0.01$) and social stress ($\beta = 0.164$, $p < 0.01$) have significant positive relationships with depersonalisation. This regression model shows that 39.7% ($R^2 = 0.397$) of the variance of depersonalisation can be expounded by the determinants. Further, it was observed in model 3 that social stress ($\beta = -0.168$, $p < 0.01$) has a significant negative relationship with personal accomplishment whereas psychological stress ($\beta = -0.108$, $p > 0.05$) was not related to personal accomplishment. Model 3 can explain 24.3% ($R^2 = 0.243$) of the variance of personal accomplishment.

5 Discussion

5.1 Findings discussion

The statistical results obtained from the subscales of Maslach burnout level indicate that 19 out of 316 nurses have burnout syndromes. The plausible reasons for this finding is persistent exposure to the high demand of psychological roles such as dealing with critically ill patients, the uncertainty of patient care, unable to provide emotional support, and observing patients suffering from pain and death. In addition, poor relationships with colleagues, supervisors, and physicians could also induce burnout syndromes (Guo et al., 2018).

According to the age category, burnout syndrome was mainly observed among nurses aged between 26 years and 35 years old who contribute 89.5% ($n = 17$) of the burnout statistics. High burnout levels in this group could be caused by more work responsibilities, over commitment to tasks, and work-related stress. This result is consistent with the study by Ahola et al. (2008) where they revealed that younger workers aged 18–34 years tend to have higher incidence of burnout. Chou et al. (2014) concurred with this finding and mentioned that older employees scored much lower than younger employees in terms of burnout levels.

Based on the category of work experience, burnout syndrome was observed in the group having 6 to 10 years of work experience ($n = 15$, 78.9%). In a research by Hu et al. (2015), the authors highlighted that nurses who have worked for 4 to 10 years had high burnout scores compared to the junior nurses. The senior nurses were assigned more tasks and responsibilities in their roles as caregivers. The greater the responsibilities, the higher the level of stress and greater the risk of burnout (Guo et al., 2018).

As for the category of the department, it was found that nurses in the surgical-based disciplines constitute 63.2% ($n = 12$) of the total number of burnout syndromes. The surgical-based disciplines include critical areas such as the intensive care unit, neurosurgical high dependent unit, cardiothoracic intensive care unit, and emergency unit where nurses are mostly dealing with critically ill patients. These critical work areas tend

to have more stressful encounters, and nurses working in these areas are more prone to develop burnout syndromes than those working in the general wards (Kroll et al., 2016).

In terms of household income, burnout symptoms were seen among nurses who earned a household income below RM 4,850 per month (n = 12, 63.2%). This low household income adds to the existing work stress among nurses due to the increasing cost of living, especially in urban areas. Regarding this finding, Cramer and Hunter (2019) explained that low income is linked to emotional stress. On the other hand, all nurses (n = 19, 100%) working on rotating shifts were found to have burnout syndromes. According to De la Fuente-Solana et al. (2021), nurses who work on rotating shifts are more susceptible to burnout syndromes as they have contact with patients in longer work hours.

The analysis results derived from the multiple regression analysis showed that psychological stress ($\beta = 0.335$, $p < 0.01$) was significantly and positively associated with emotional exhaustion. This finding is consistent with the study by Guo and Zheng (2019) where they revealed that death and dying stress were significantly related to the emotional exhaustion of nurses who work in the intensive care unit. In a study by Kroll et al. (2016), emotional exhaustion was found to be associated with the psychological roles of healthcare staff working in pain management centres. Persistent exposure to this stressful environment could deplete their energy and eventually lead to burnout syndrome. Next, according to the analysis result, it was revealed that social stress ($\beta = 0.379$, $p < 0.01$) is positively related to emotional exhaustion. According to Roomaney et al. (2017), interpersonal conflict as part of social stress is one of the significant predictors of emotional exhaustion. Disrespectful interactions with co-workers and subordinates worsen the level of emotional exhaustion (Khoo et al., 2017). Criticisms from supervisors and physicians and poor relationships among colleagues are the main elements of social stress that could cause emotional exhaustion (Mao et al., 2020).

Further, psychological stress ($\beta = 0.286$, $p < 0.01$) was found positively linked to depersonalisation. Insufficient psychological support such as lack of experience, poor knowledge, and lack of training will lead to work disengagement, workers being unfocused, reduced performance, and depersonalisation. A study conducted by Newman et al. (2020) revealed that for nurses who work with psychiatric patients, depersonalisation was positively correlated with an uncertainty of treatment and care for the patients. Moreover, fear of death and dying was a significant predictor of depersonalisation (Guo and Zheng, 2019). Also, social stress ($\beta = 0.164$, $p < 0.01$) was discovered to have a significant positive relationship with depersonalisation. Research by Uziel et al. (2019) stated that the relationship among healthcare staff was found to be significantly related to depersonalisation. Prolonged exposure to stressful relationships will cause social stress and result in depersonalisation (Lahana et al., 2017).

Finally, this study revealed that social stress ($\beta = –0.168$, $p < 0.01$) is significantly and negatively associated with personal accomplishment. This finding is supported by Elshaer et al. (2018) where they found that personal accomplishment was linked to inter-group conflict. The higher the inter-group conflict, the lower the personal accomplishment. Another study by Banovcinova and Baskova (2014) revealed that personal accomplishment was significantly associated with conflicts between midwives and doctors. Interpersonal conflicts could reduce work engagement and performance and subsequently lead to low personal accomplishment. On the contrary, it was found that psychological stress ($\beta = –0.108$, $p > 0.05$) was not significantly related to personal accomplishment. Research by Kroll et al. (2016) stated that psychological stress was not

a significant predictor of personal accomplishment among healthcare personnel working in pain management centres. In addition, a study by Gama et al. (2014) also confirmed that dealing with death was not a significant predictor of personal accomplishment among oncology nurses. These past studies concurred with our findings.

5.2 Research implications

From a theoretical perspective, this study contributes to the extant research of burnout level by determining it via the demographic profiles of the nurses. The research findings further provide empirical evidence by formulating hypotheses to investigate the relationships between the work-related stress and the dimensions of burnout in the public hospitals. Besides, this study also seeks to close the practical knowledge gap by uncovering the specific groups of nurses via their demographic profiles who are prone to develop burnout symptoms and experience burnout.

From a managerial perspective, our study provides strategies and interventions to the nursing management in public hospitals to reduce the incidence of burnout among nurses. The findings of this study propose the following strategies for nursing management:

a to organise training courses on nurses' well-being and stress management skills, especially for those who are at risk of having burnout syndromes

b to create a healthy workplace by arranging social support programs to buffer nurses' exhaustion

c to design effective coping mechanisms for nurses to improve their abilities in handling stressful encounters

d to build a resilient team to keep psychological health and social relationships at the healthiest level in fighting against burnout

e to increase the meaningfulness of work by improving job characteristics, (i.e., skill variety, task significance, feedback) of the nurses

f to establish guidelines for nurses to overcome burnout and stay motivated.

6 Conclusions

By investigating the nurses' demographic characteristics and burnout syndromes, it was found that nurses in the 26–35 age group, having 6 to 10 years of work experience, and working in the surgical-based disciplines and on rotating shifts show high levels of emotional exhaustion, depersonalisation, and low personal accomplishment. In addition, those nurses earning a household income of less than RM4,850 per month are most likely to be diagnosed with burnout syndromes. This study revealed that psychological stress and social stress are significant predictors of burnout syndrome. The findings of the study alert the hospital management to focus on high-risk groups of nurses and take appropriate actions to reduce their burnout levels. Additionally, this study draws the attention of health authorities to improve psychological and social work resources of the healthcare institutions to ensure a healthy workplace for the caregivers.

7 Limitations and future research

First, cross-sectional quantitative research is used in this research. The data is collected at one point in time and no further follow-up or interview is conducted with the respondents. Future research is suggested to use a mixed-method approach to obtain more comprehensive findings of the study. Second, this study was conducted in a public hospital centre where the findings may not be generalisable to a larger group of nurses in the country. Future study is recommended to expand the research population to a larger scale which involves a multi-centre approach for better generalisation of the findings. Third, the predictor variables of burnout used in this research are not exhaustive. Future studies can add more relevant determinants such as work environment, work engagement and job satisfaction to improve the predictability of burnout.

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