

BURNOUT SYNDROME AND ITS PREDICTORS AMONG NURSES IN PRIMARY HEALTH CARE FACILITIES DURING COVID-19

By

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Abstract

Introduction: Job burnout is a substantial problem among health care workers. **Aim of Work:** To determine the prevalence of burnout, its predictors among nurses working in primary health care facilities during COVID-19 in Egypt. **Materials and Methods:** A multicenter descriptive cross-sectional study was conducted on all nurses (250) working in primary health care facilities (11 units and 5 centers) in Port Said city between March and June 2020. An interviewer-administered questionnaire including socio-demographic, occupational and contextual questions contributing to burnout. While the second one was the standardized Arabic version of Maslach Burnout Inventory (MBI). **Results:** The prevalence of high burnout among nurses was 86%. The most prevalent subscale was low level personal accomplishment followed by high depersonalization (DP) then emotional exhaustion (EE). Time insufficiency for family, bad work relationships, being a technical nurses and inflexibility in work scheduling were predictors of both EE and DP. Moreover, EE was significantly associated with married female nurses who experienced work-related stress. While high DP was significantly associated with older male married registered nurse who had longer working hours weekly and lack of PPE. Burnout predictors were lack of PPE (AOR=27.57; 95% CI: 3.2-30.45), presence of work-related stress (AOR=10.6; 95% CI: 2.17-25.22) and inflexibility in work scheduling (OR=3.71; 95% CI:1.07 -12.84). **Conclusion and Recommendations:** Most of the primary health care nurses experienced high levels of

burnout during COVID-19 pandemic. Work related stress, inflexibility of scheduling, lack of PPE displayed significant prediction of burnout. Health-care environments can be enhanced through providing protective equipment, adjusting workhours, ensuring hours of effective rest, increasing manpower to reduce workload.

Keywords: Burnout; Nurses; Predictors; Primary healthcare facilities and COVID-19

Introduction

COVID-19 was initially discovered in Wuhan, China, in December 2019 (Asnakew et al., 2021). It swiftly spread all over the world, resulting in a huge worldwide health crisis. The condition has posed unique obstacles, resulting in an increase in mental instabilities among healthcare workers (De Kock et al., 2021). Particularly, nurses are at higher risk since they are actively involved in the patients care, exposing them to COVID-19 infections (Al Thobaity and Alshammari, 2020). According to a meta-analysis, nurses accounted for 25.3% of COVID-19 deaths among healthcare personnel (Bandyopadhyay et al., 2020).

Burnout syndrome (BOS) is defined as a psychological syndrome of emotional exhaustion (EE), depersonalization (DP) and reduced personal accomplishment (PA) that occurs among individuals who work with other people, particularly in conflicting critical situations (Dall'Ora et al., 2020). Research has shown that burnout is different from certain types

of mental diseases such as anxiety, irritability and depression (Preston, 2020). The European Agency for Safety and Health at Work considers health care facilities as work-related stressful places due to physical tensions, psychosocial threats, and work-associated violence (EU-OSHA, 2007). Recognizing and describing burnout is vital as it can have a negative impact on both providers and patient care. It is associated with medical mistakes, unexplained work absenteeism, drop in care quality, and poor patient satisfaction (Suñer-Soler et al., 2014).

According to a recent study, nurses experienced moderate to high degrees of burnout during COVID-19, particularly in high-income nations . According to a comprehensive review and meta-analysis of 16 research involving 18 935 nurses, the total prevalence of emotional fatigue, depersonalization and personal achievement was 34.1 %, 12.6 %, and 15.2 % respectively (Prasad et al., 2021). Burnout was reported by 49 % of 20 947 respondents in a research conducted in the United

States (Poghosyan et al., 2010). Studies in China have shown mixed results, with some indicating a high level and others indicating minimal levels of burnout among nurses (Hu et al., 2020). Burnout risk factors among nurses include working in high-risk places, delayed diagnosis, insufficient training, inadequate or deficiency of personal protective equipment (PPE), extended contact to COVID-19 patients, changes in day-to-day imports, social support, uneven working hours and increased workload, separation from families and friends (Spoorthy et al., 2020). Gender, marital status, and age are among the other demographic characteristics (Lasalvia et al., 2021). Other studies have found that medical roles had a higher risk of burnout than non-medical (Denning et al., 2021).

Up to our knowledge, the literature revealed that there are limited studies about nurses' burnout during COVID-19 in Egypt. In addition, the primary healthcare facilities in Port Said city are expanding nowadays and the work force of all healthcare workers including nurses is expected to be increased and burdened specially after the sequential implementation of the Egyptian Health Insurance Law starting

with Port Said governorate.

Aim of Work

To determine the prevalence of burnout, its predictors among nurses working in primary health care facilities during COVID-19 in Egypt.

Materials and Methods

Study design: It is a cross-sectional study.

Place and duration of the study: The study was conducted from March 1st to June 30th, 2020. It was carried out at all the primary health care facilities in Port Said city; that were 16 units at the time of the study

conduction. Port Said is one of the eastern Egyptian governorates including only an urban area with 98.2% of that area is populated. On February 14, 2020, Egypt announced the first COVID-19 case in Africa and recorded 10 000 cases about three months later (Tuite et al., 2020).

Study participants: The study population was all nurses working in primary health care facilities of Port Said city who accepted to share in the study and fulfilling the legibility criteria. Inclusion criteria were working full time at least for one year and being free of any psychiatric disorders.

Sampling: All working nurses (297 nurses) in primary health care facilities in Port Said city at the time of the study were targeted. However, 17 nurses refused to participate, 5 nurses didn't complete the interview and 5 nurses were on vacation at the time of the study. Also, 20 questionnaires were excluded as they were used for external pilot study. The total final completed questionnaires were 250.

Study methods: All participants underwent an interviewer-administered packet of two questionnaires that took 25 minutes for each nurse at her rest time.

-**The first one** included socio-demographic and occupational and contextual questions contributing to burnout retrieved from other studies (Abdo et al., 2016).

-**The second one** was the **Maslach Burnout Inventory (MBI)** (Maslach et al., 1997) which is an effective tool of proven reliability and validity in spotting the presence and evaluating the degree of burnout in service workers. It is a psychological assessment instrument comprising 22 symptom items pertaining to occupational burnout. MBI measures 3 dimensions or subscales of burnout: Emotional Exhaustion (EE)

(9 items), Depersonalization (DP) (5 items), and Personal Accomplishment (PA) (8 items). Respondents score items on a scale from zero to 6 as follow: 0 = never; 1 = a few times a year; 2 = once a month; 3 = a few times a month; 4 = once a week; 5 = a few times a week, and 6 = every day. The scores were echoed as a high score in the first two scales and a low score in the last subscale of burnout. EE subscale is interpreted into High (≥ 27), Moderate (19-26) and Low (0-18). DP subscale is interpreted into High (≥ 10), Moderate (6-9) and Low (0-5). PA is interpreted into High (0-33), Moderate (34-39) and Low (≥ 40). On the total burnout scale scores of 1–33 is considered as Low, 34 – 66 as Average and 67–99.9 as High level of burnout as retrieved from another Egyptian study (Abdo et al., 2016)

The Arabic version had been validated and has acceptable psychometric properties (Ibtissam et al., 2012). The content validity of the questionnaires was insured by a group of 10 experts in the field of Occupational Medicine where the questionnaire was amended according to their comments and suggestions. Finally, the questionnaire was pilot tested on 20 nurses in order to check

its clarity and validity and for training the investigators on collecting data and adjusting time to fill the questionnaire. All nurses included in the pilot study were excluded from the full-scale study and analysis. The estimated Cronbach's alpha for internal consistency of the tool was 0.82 which is scientifically accepted, and the content validity index ranged from 0.71-0.90 for different items.

Operational definitions for job title and work status of the participating nurse: According to Almalki et al. (2011); Specialized Nurse: is the nurse who has a university degree and Technical Nurse: is the nurse who was graduated from a nursing school or a nursing institute. According to Yeh et al. (2007), Temporary Work Situation Nurse: is the nurse who works with contract for a limited period and Registered Work Situation Nurse: is the nurse with a long-term contract (permanent job).

Consent

Before the start of work, an informed written consent was obtained from each nurse sharing in the study after assuring confidentiality, anonymity of the data and personal privacy

Ethical Approval

Approvals were obtained from Mansoura Faculty of Medicine Institutional Research Board with registration code: MS.19.03.535, and from the authorities of the included primary health care facilities in Port Said city.

Data Management

The collected data were coded, processed and analyzed using the SPSS program (version 22.0). Qualitative data were described using numbers and percentages. Quantitative data were presented as medians and ranges (minimum and maximum) for non-parametric data versus means \pm standard deviation for parametric data after testing normality using one-sample Kolmogorov-Smirnov test. For parametric data: Chi-square, Fischer exact and Monte Carlo tests were used to test the significance of categorical data. Student t-test was used to compare two independent groups. One Way ANOVA test was used to compare more than two independent groups with Post Hoc. Tukey test. For non-parametric data: Mann-Whitney U test was used to compare two independent groups. Kruskal Wallis test was used to compare more than 2 independent groups with Mann Whitney U test. Binary stepwise

logistic regression analysis was utilized to predict independent variables of EE, DP and BOS. Significant predictors in Univariate analysis were entered into regression model utilizing

forward Wald method /Enter. Adjusted odds ratios and their 95% confidence interval were calculated. The level of statistical significance was set at $p < 0.05$.

Results

Table (1): Socio-demographic and occupational characteristics of the studied nurses (No=250).

Characteristics	Categories	No (%)	Characteristics	No (%)
Socio-demographic characteristics			Occupational characteristics	
Age (years)	Mean± SD Range (Min-Max)	39.8±10.95 19.0-58.0	Working (hours/week) Mean± SD	43.46±8.63
Gender	Male Female	40(16) 210 (84)	Work-related violence	224(89.6)
Marital status	Single Married Divorced Widow	55(22) 165(66) 25(10) 5(2)	Bad working relationship	142(56.8)
			^a Time insufficiency	148(59.2)
			Work related stress	222(88.8)
			Scheduling inflexibility	81(32.4)
Work status	Temporary Registered	10(4) 240(96)	Administrative burden	200(80)
			COVID 19 training course	40(16)
Job title	Technical nurse Specialized nurse Head of nursing	205(82) 40(16) 5(2)	PPE unavailability	75(30)

No: number; PPE:personal protective equipment, ^a:Time insufficiency for leisure and family.

The socio-demographic characteristics of the studied nurses revealed that their mean age was 39.8±10.95 years ranging from 19-58 years. The majority were married females working as technical nurses. They had mean working hours 43.46±8.63 per week. Most of the studied nurses were suffering from exposure to work-related violence (89.6%), bad work relationship (56.8%), insufficient time availability (59.2%), work related stress (88.8%) and administrative burden (80%). Furthermore, only 16% enrolled in COVID-19 training course. About three quarters (30%) reported lack of PPE as masks and gloves (Table 1).

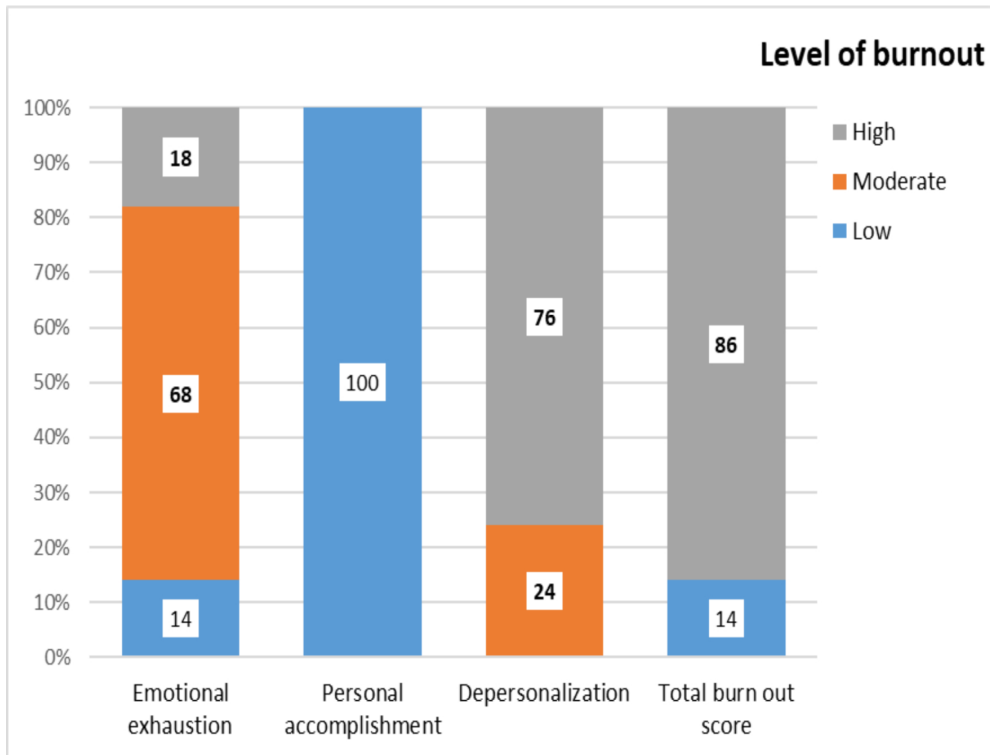


Figure (1): Level of burnout and its domains among the studied nurses

Figure (1) illustrates that overall prevalence of high burnout level among the studied nurses was 86%. The most affected subscale was low PA (Personal Accomplishment) (100%) then high DP (Depersonalization) (76%) followed by high EE (Emotional Exhaustion) (18%).

Table (2): Univariate and multivariate analysis of predictors of Moderate-High emotional exhaustion among the studied nurses (No =215).

Risk factors	Categories	EE ^a No (%)	Univariate analysis	Multivariate analysis
			COR (95% CI)	AOR (95% CI)
Age	Mean \pm SD (years)	40.02 \pm 10.65	1.01 (0.98-1.05)	
Female vs male		185 (88.1)	2.4 (1.08-5.65)*	1.7 (1.5 -5.09)*
Marital status	Single vs others	45 (81.8)	2.2 (0.81-6.25)	0.3 (0.09-1.1)
	Married vs others ^b	150 (90.9)	5 (1.98-12.62)*	1.3 (0.3-5.2)*
Job title	Technical vs specialized	185 (90.2)	5.5 (2.52-12.22)*	4.58 (1.3 -11.2)*
	Head nurse vs specialized	5 (100.0)	undefined	undefined
Bad work relationships		136 (95.8)	8.3 (3.31-20.92)*	7.23(2.35-11.5)*
Time insufficiency ^c		142 (95.9)	9.4 (3.73-23.67)*	9.1(3.87-23.54)*
Scheduling inflexibility		75(92.6)	2.59(1.03-6.51)*	2.52 (1.12-6.24)
COVID-19 training		30 (75.0)	0.4 (0.18 -0.93)*	0.38(0.15-0.83)*
PPE unavailability		70 (93.3)	2.89 (1.08-7.78)*	2.15(1.12-8.14)*

AOR: Adjusted odds ratio; COR: Crude odds ratio; CI: Confidence interval,
a : Moderate and high emotional exhaustion; b : Others as divorced and widow;
c Time insufficiency for leisure and family; PPE: Personal protective equipment;
*: Statistically significant at $p < 0.05$

Table (2) illustrates that Moderate and High EE was significantly associated with married technical female nurses who had bad work relationships, scheduling inflexibility and time insufficiency for family. On the other hand, their predictors were insufficient time availability for family (AOR=9.1; 95% CI:3.87-23.54), bad work relationships (AOR=7.23; 95% CI:2.35-11.5), being a technical nurse (AOR=4.58; 95% CI :1.32-11.25), scheduling inflexibility (AOR=2.52; 95% CI:1.12-6.24), being a female (AOR=1.72; 95% CI:1.58-5.09) and lack of personal protective equipment (AOR=2.15; 95% CI:1.12-8.14) while enrollment in a COVID-19 training course is considered a protective factor (OR=0.389; 95% CI:0.154-0.825).

Table (3): Univariate and multivariate analysis of predictors of high depersonalization level among the studied nurses (No=190).

Risk factors	Categories	DP ^a No (%)	Univariate analysis	Multivariate analysis
			COR (95%CI)	AOR (95%CI)
Age /years		41.37±10.32	1.45(1.1-5.87)*	1.02(0.98-1.065)
Male vs Female		35(87.5)	2.48(0.93-6.66) *	
Marital status	Married vs single	135(81.8)	3.8(1.93-7.3) *	3.75(1.93-7.27) *
	Others ^b vs single	25(83.3)	4.17(1.39-12.5) *	3.33(1.09-10.16) *
Registered vs temporary		185(77.1)	3.4(0.94-12.05) *	6.49(1.52-27.76) *
Job title	Technical vs specialized	160(78.0)	2.13(1.04-4.39) *	2.05(0.228-2.96) *
	Head nurse vs specialized	5(100)	undefined	undefined
Working hours/week		44.08±9.78	1.25(1.02-1.87) *	1.34(1.14-1.56) *
Bad work relationships		133(93.7)	13.22(6.10-28.66) *	13.22(6.10-28.66) *
Time insufficiency ^c		138(93.2)	13.27(6.27-28.09) *	12.08(5.20-25.01) *
Scheduling inflexibility		75(92.6)	5.87(2.41-4.32) *	2.51(1.89-14.33) *
COVID-19 training		20(50.0)	0.24(0.12-0.48) *	0.24 (0.09-0.60) *
PPE Unavailability		60(80)	1.38(0.75-2.68)	4.91(1.92-12.58) *

AOR: Adjusted odds ratio; COR: Crude odds ratio; CI: Confidence interval, a:High depersonalization; b :Others as divorced and widow; c :Time insufficiency for leisure and family; PPE: Personal protective equipment; *: Statistically significant at $p < 0.05$

High DP was significantly associated with older male, married, registered technical nurse who had longer working hours weekly, had time insufficiency, scheduling inflexibility and bad work relationships. Similarly, high DP predictors of were bad work relationships (AOR=13.22 ; 95% CI:6.1-28.66), insufficient time availability for family, friends or leisure (AOR=12.08; 95% CI:5.2-25.01), being registered nurses (AOR=6.49; 95% CI:1.52-27.76), lacking PPE (AOR=4.91; 95% CI:1.92-12.58) being married nurse (AOR=3.75; 95% CI:1.93-7.27), inflexibility in work scheduling (AOR=2.51; 95% CI:1.89-14.33), technical nurse (AOR=2.05; 95% CI:0.228-2.96) and increased duration of working weekly(AOR=1.34; 95% CI:1.14-1.56). Meanwhile enrollment in a COVID-19 training course is a protective factor (AOR=0.24; 95% CI:0.097-0.60) (Table 3).

Table (4): Univariate and multivariate analysis of predictors of High burn out level among the studied nurses.(No=190)

Risk factors	(BOS) ^a No (%)	Univariate analysis	Multivariate analysis
		COR (95%CI)	AOR (95%CI)
Work related stress	202(91.0)	11.7(4.87-27.9) *	10.60(2.17-5.22) *
Scheduling inflexibility	77(95.1)	4.32(1.47-12.7) *	3.71(1.07-12.84) *
Administrative burden	168(84)	2.98(0.87-10.18) *	
PPE unavailability	70(93.3)	2.89(1.08-7.79) *	27.57(3.20-0.45) *

AOR: Adjusted odds ratio; COR: Crude odds ratio; CI: Confidence interval;

a :Burn out syndrom (Moderate and High); PPE: personal protective equipment,

* :statistically significant at $p < 0.05$.

Univariate and multivariate analysis revealed BOS predictive factors as lack of PPE (AOR=27.57; 95% CI: 3.2-30.45), presence of work-related stress (AOR=10.6 ; 95% CI: 2.17-25.22) and inflexibility in work scheduling (AOR=3.71; 95% CI:1.07 -12.84) (Table 4)

Discussion

Job burnout syndrome (BOS) is a substantial problem among health care workers. The current multicenter cross-sectional study was conducted among 250 nurses working in primary health care facilities of Port Said city to determine the prevalence of burnout, its predictors among nurses working in primary health care facilities during COVID-19 in Egypt.

Burnout was the complain of 86% of the present sample of nursing workforce (Figure1). The elevated level of burnout among nurses may be attributed to the work-related burden posed by the COVID- 19 pandemic.

The prevalence of BOS among the studied group is considerably higher compared to other studies; USA (19%) (Poghosyan et al., 2010), China (16.0%) (Zhang et al., 2014), Portugal (7%) (Giannini et al., 2013). The variances in outcomes may be due to different settings, tools used samples and sample sizes as well as variability of workplaces, policies and cultures. The current study displayed that about one-fifth (18%), three-quarters (76%), and all (100%) of the respondents recorded high Emotional Exhaustion (EE) and Depolarization (DP), and

Low Personal Accomplishment (PA), respectively (Figure1). This was in line with a multinational study conducted during the first wave of the COVID-19 pandemic exploring the prevalence of BOS among health-care workers. It was found that nearly half (56%), (48.9%), and about one-third (38%) of the participants showed high EE, high DP, low PA, respectively (Orrù et al., 2021). Moreover, an Egyptian study in Asuit exhibited that about one-third (35.5%), two-thirds (70.6%), and one-quarter (26.5%) of the respondents recorded high EE and DP, and low PA, respectively (Elghazally et al., 2021).

Regarding effect of gender on BOS: statistically, EE scores were significantly higher among females (Table 2), while DP scores were higher among males (Table 3); which is consistent with the results detected by Terrones-Rodríguez et al. (2016) on their study on burnout syndrome in medical residents at the general hospital at Durango, Mexico. Others didn't record any difference as Jalili et al. (2021) in Tahrán, Iran, thus demonstrating that females were more prone to burnout. This could be attributed to cumulative loads of their household and career responsibilities (Osman and Abdlrheem, 2019).

In the present work, age was found to be an associated factor in DP only, not for other domains or total burnout score burnout, as the oldest age group recorded high DP score ($p < 0.001$) (Table 3). This was in accordance with Salem et al. (2018) in their study on burnout among physicians in Qatar, but was in disagreement with an Egyptian study done by Elghazally et al. (2021).

Concerning marital status, married studied nurses were more prone to be affected as they had significantly higher EE and DP scores (Table 2). This agreed with studies carried out in Egypt by Farahat et al. (2016) and in Saudi Arabia by Aldrees et al. (2013). This is because working married women in Middle Eastern society are under multifactorial stress; work, home and social (Teo, 2022).

Registered studied nurses have high DP (<0.05) (Table 3). Registered nurses institute the pivot of healthcare activities, also mastering responsibilities in the fields of other health occupations. This cloudiness of professional borders is linked to unlimited expectations of the registered nurses. Other occupational factor as job title being technical nurse is an associated factor of EE and DP especially with increased working hours

(Lindahl Norberg and Strand, 2022).

Also working environmental factors were associated with high DP (Table 3), EE (Table 2) and/or BOS (Table 4) represented in bad working relationship, stress schedule inflexibility and time insufficiency to family and leisure. Abdo and his colleagues (2016) spotted work burden, supervision and work activities were significant predictors of burnout syndrome among their studied group of nurses in Tanta , Egypt. Lagerström et al. (2010) also described work frustration and imbalance between work demands and family as the most significant factors donating burnout among Iranian nurses.

The present study's findings support earlier research in which nurses rated their mutual relationships with colleagues the highest among various aspects of their work environments (Al Sabei et al., 2020). This could be attributed to the widespread attention toward enforcing teamwork among healthcare professionals.

COVID related factors that significantly increased EE (Table 2), DP (Table 3) and BOS (Table 4) was unavailability of PPE. While enrollment in COVID-19 training course was a protective variable against EE (Table

2), DP (Table 3). These results were consistent with the findings of other studies conducted in Singapore (Ong et al., 2020). PPE is crucial for frontline nurses which decreases the risk of COVID-19 spread (Kabunga and Okalo, 2021).

Limitations of the study: Although the current study is considered the first study to focus on burnout level and their associated factors among nurses during the first wave of COVID-19 pandemic in Port Said, using a standard definition of burnout in all governmental primary care centers in Port Said city, we acknowledge number of limitations. Similar to previous studies we used a cross-sectional design which cannot prove causation but rather only association. Since the questionnaire depends on self-reported information, recall bias cannot be excluded. Although the study was conducted in Port Said city only, the findings of this study can be generalized to Egypt as Port Said was chosen to be the first city to apply the medical insurance system.

Metanalysis research is recommended to determine the entire associated factors and predictors of high level burn out so inclusive intervention for prophylaxis and management could be applied especially during health threats.

Conclusion and Recommendations:

Most of the primary health care nurses were experiencing high levels of burnout. Sociodemographic, personal and lifestyle characteristics display significant prediction of burnout and its domains. Health-care environments can be boosted through detecting the burnout predictors and effectively engaging nurses in developing stress management workshops.

Conflict of Interest

The authors declared that there was no conflict of interest.

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