*Original article*

# The relationship between inpatient nurse burnout and safety outcomes in a teaching hospital in Thailand

**Witoonsut C, Aekplakorn W, Phaipayom N and Wongrathanandha C**

*Department of Community Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University*

**Objectives** To identify the prevalence of inpatient nurse burnout and determine the association between burnout and safety outcomes based on self-reports and system reports, including medication errors, and sharp object injuries.

**Methods** A cross-sectional study was conducted of 1,464 inpatient nurses at a teaching hospital in Thailand. A self-administered questionnaire was used to collect demographic data, burnout assessment, and self-reported safety outcomes. System-reported safety outcomes were obtained from hospital incident occurrence reports (IOR). Mixed effect logistic regression and negative binomial regression models were used to explore the association between inpatient nurse burnout and both self-reported and IOR safety outcomes.

**Results** Of the 702 participating inpatient nurses, 27% reported high emotional exhaustion, 13% reported high depersonalization, and only one nurse reported low personal accomplishment. The high emotional exhaustion dimension was statistically associated with self-reported medication errors (ORadj 1.90, 95%CI 1.1-3.2) and self-reported sharp object injuries (ORadj 3.12, 95%CI 1.2-7.9). For each one-point increase in emotional exhaustion on a 7-point Likert scale, the rate of reported sharp object injuries increased by 15% ($p < 0.05$).

**Conclusions** Emotional exhaustion among inpatient nurses was noticeable and could potentially impact on patient and personnel safety. Identification of nurses with emotional exhaustion and provision of support should be considered as a part of included in policies to improve safety outcomes in the healthcare services. **Chiang Mai Medical Journal 2021;60(3):325-34. doi: 10.12982/CMUMEDJ.2021.29**

**Keywords**: burnout, inpatient nurse, medication errors, sharp object injuries, safety outcomes

## Introduction

Safety is an issue of significant concern in many occupational settings, including the healthcare sector. Healthcare accreditation organizations worldwide, including Thailand's Healthcare Accreditation Institute, are determined to promote and enhance safety policies in health facilities to provide safe healthcare delivery. In 2017, a national health policy, the 'Patient and Personnel Safety Goals (2P safety)' was initiated in Thailand to encourage high-quality healthcare services that are safe for both patients and healthcare personnel. Several outcomes, including medication errors and sharp object injuries, were specified as 2P safety indicators (1).

Medication errors can occur at various stages of the medical delivery process; however, they occur most frequently during the administration phase, and are most frequently committed by nurses (2). A study of Southeast Asian countries reported that the rate of administration errors was between 15.2% and 88% (3). The consequences of medication errors can range from no harm to patient death. These errors can result in an increased mortality rate, increased duration

Correspondence: Chonnipa Witoonsut, MD, Department of Community Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok 10700, Thailand
E-mail: chonniiibenzy@gmail.com

Received: February 22, 2021, Revised: March 9, 2021; Accepted: March 24, 2021

of hospitalization, and increased medical costs (4). Regarding sharp object injuries, the United States Centers for Disease Control and Prevention (CDC) has estimated that approximately 385,000 healthcare workers in the U.S. are exposed to percutaneous injuries every year and that more than 1,000 injuries occur each day (5). In Thailand, a study by Honda et al. found that 55% of nurses had been injured by sharp instruments within the previous 12 months (6). Although the majority of sharp object injuries are not life-threatening, possible severe consequences include transmission of infectious diseases such as hepatitis B, hepatitis C, and human immunodeficiency virus infection.

Factors leading to medication errors and sharp object injuries among nurses can be classified as active failures and latent conditions. Based on Reason's Swiss cheese model, active failures are defined as unsafe acts executed by individual nurses and latent conditions are the flaws within organizations (7). One of the individual nurse-related factors recently found to be associated with medication errors and sharp object injuries was burnout (8,9). Burnout, an occupational phenomenon resulting from the unsuccessful management of chronic workplace stress, consists of three dimensions: emotional exhaustion, depersonalization, and a low degree of personal accomplishment (10). It mostly occurs among various professions who work with people in challenging situations, including the nursing profession (11). A previous study of nurse burnout in nine countries by Aiken et al. (2011) found that 42% of nurses in Thailand reported a high level of burnout (12). The problem is that nurse burnout can affect both the well-being of nurses and the quality of healthcare delivery (13). Additionally, a systematic review by Hall and colleagues reported a significant association between burnout and patient safety (14).

In Thailand, there have been few studies of the association between burnout and medication errors. One previous study documented a positive association between burnout and medication errors among nurses, but the study was conducted exclusively in a community hospital setting (8). Studies in large hospitals or teaching hospitals where the number of care procedures are higher and safety programs are presumed to be much more organized, however, have been very limited. In addition, no studies have investigated the relationship between nurse burnout and sharp object injuries, especially injuries reported via the hospital incident occurrence report (IOR) system.

## Objectives

The objective of this study was to identify the prevalence of burnout and investigate the association between burnout and safety outcomes, including system-reported and self-reported medication errors and sharp object injuries, among inpatient nurses at a teaching hospital in Thailand.

## Methods

This cross-sectional study was conducted among 1,464 inpatient nurses in 71 selected wards of one teaching hospital. The required minimum sample size, 700 inpatient nurses, was determined by applying the sample size guideline for logistic regression in large populations (15). The actual initial sample size was based on an anticipated non-response rate of 50%. All inpatient nurses who had been working in the hospital for one year or more were invited to participate in the study. Nurses who agreed to participate were requested to complete a questionnaire, which included an explanation of the study's purposes and assurance that their responses would be kept confidential and anonymous. The study was conducted between July and August 2020 and was approved by the Institutional Review Board of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University. (MURA 2020/510)

### Research instruments

This study used primary data from a self-administered questionnaire and secondary data from the hospital record system. The questionnaire consisted of three parts. The first part was demographic data, including personal and working history. The second part was a Maslach Burnout Inventory (MBI) questionnaire, a burnout

questionnaire for healthcare personnel. This questionnaire was translated into Thai by the Mental Health Center 7, Khon Kaen, and tested for internal consistency with a Cronbach's alpha coefficient of 0.80 (16). It was composed of 22 questions measuring three dimensions of burnout: emotional exhaustion (EE) 9 questions, depersonalization (DP) 5 questions, and personal accomplishment (PA) 8 questions. The questions were written in the form of statements about job-related feelings, e.g., "I feel emotionally drained from my work". The emotional exhaustion and depersonalization dimensions were measured using a seven-point Likert scale (from 0 = never to 6 = every day), while personal accomplishment was reverse scored (6 = never, to 0 = every day) and was based on respondent experiences. An EE score of 27 or higher indicates high emotional exhaustion, a DP score of 13 or higher indicates high depersonalization, and a PA score of less than 32 indicates a feeling of low personal accomplishment. Scores of 17 to 26 on the EE dimension, 7 to 12 on the DP dimension, and 32 to 38 on the PA dimension show evidence of moderate burnout. Scores of 16 or lower on the EE dimension, 6 or lower on the DP dimension, and 39 or higher on the PA dimension show evidence of low burnout. Individuals with high emotional exhaustion and depersonalization combined with low personal accomplishment were categorized as having burnout syndrome as defined by the World Health Organization (WHO) (10). The last part of the questionnaire was self-reported medication errors and sharp object injuries. A medication error was defined as any error in the process of drug preparation or drug administration that harmed or could have harmed the patient, e.g., wrong drug, wrong dose, or unordered drug. (17) A sharp object injury was defined as an incident that caused a blade, needle, or other medical instrument to unintentionally penetrate the skin of the respondent while working (18). Responses were obtained from two yes-no questions: 1) "Have you ever made a medication error during the past year?" and 2) "Have you ever had an injury from a sharp object during the past year?".

Reports of medication errors and sharp object injuries were obtained from the hospital IOR online reporting system. In this hospital, personnel were required to report all incidents, including medication errors and sharp object injuries, via the reporting system. The cumulative number of incidents in each ward during the past year were obtained. This data did not include any personal information of those involved in the incidents. Additionally, the data on the number of nurses, number of beds, and length of hospital stay in each ward for the same period were collected to control for confounding.

**Statistical analysis**

Descriptive statistics were used to measure the characteristics of participants and the overall picture of burnout. Categorical variables, e.g., gender and marital status, were calculated as percentages. Continuous variables such as age and nursing experience were reported as means and standard deviations (SD).

Inferential statistics were used to explore the association between nurse burnout and safety outcomes at both the individual and ward levels. For the individual level, self-reported safety outcomes were treated as dichotomous variables. The data were analyzed using a mixed logistic regression model to take into account differences among inpatient wards. Odds ratios (OR) and 95% confidence intervals (CI) were calculated. Variables were selected based on previous knowledge and potential association with outcomes at a $p < .15$ from the Chi-squared tests (19). These variables were assessed for multicollinearity using variance inflation factors (VIF) before being included in the final model. At the ward level, the reported number of medication errors and sharp object injury incidents in each ward were regressed on the average scores of the burnout dimensions using a negative binomial regression model to take into account the potential overdispersion of the data. The covariates in the models included the nurse-to-bed ratio, type of inpatient ward and bed occupancy rate. The inpatient wards were categorized as private, general, intensive care units (ICU) or

semi-ICUs. Bed occupancy rates were calculated using the formula: (number of inpatient days x 100)/(number of beds x 365). Incidence rate ratios (IRR) and 95% CIs were calculated. All analyses were conducted using STATA 14.0. A p value of .05 was set as the level of statistical significance.

## Results

A total of 702 nurses from 68 inpatient wards completed the questionnaire (a 48% response rate). The participants were predominantly female (97.4%), with an average age of 32 years. The majority of the nurses were single and had graduated with a bachelor's degree. The average length of working experience as a nurse was 9.62 years. Six hundred and forty-eight of the nurses (92.3%) worked in shifts. The average hours worked per week and number of night shifts per month were 46.50 (SD = 8.84) and 6.09 (SD = 3.22), respectively. Approximately 52% and 48% of the nurses had been trained on how to prevent sharp object injuries and how to avoid medication errors, respectively (Table 1). Regarding burnout, 27% of the nurses had high emotional exhaustion, 13% had high depersonalization, and only one nurse had a low personal accomplishment. None of the nurses had burnout syndrome as defined by the WHO (Figure 1). At the ward level, the mean score for each burnout dimension was 20.02 (SD = 5.2) for emotional exhaustion, 6.6 (SD = 3.5) for depersonalization, and 13.44 (SD = 3.4) for personal accomplishment.

There were 22 private wards (32.4%), 30 general wards (44.1%), and 16 ICUs and semi-ICUs (23.5%). The average number of nurses in each ward was 20.5 (SD = 9.8). The mean number of inpatients per year was 865.91 (SD = 581.62). The mean number of beds was 15.4 (range 4-41), and the average nurse-to-bed ratio was 1.77. The average occupancy rate was 71.5%, varying between 28.1% in

**Table 1.** Baseline characteristics of inpatient nurses, n=702

| Variables | Numbers (%) |
|---|---|
| Age (years), mean ± SD | 32.17 ± 7.47 |
| Gender | |
| Female | 684 (97.4) |
| Male | 18 (2.6) |
| Marital status | |
| Single | 512 (72.9) |
| Other (Married/Divorced/Widowed) | 190 (27.1) |
| Level of education | |
| Bachelor's degree | 614 (87.5) |
| Master's degree | 88 (12.5) |
| Income (baht per month), mean ± SD | 34,916.70 ± 8,960.05 |
| Nursing experience (years), mean ± SD | 9.62 ± 7.35 |
| Shift work (%) | 648 (92.3) |
| Number of night shifts per month, mean ± SD | 6.09 ± 3.22 |
| Work hours per week, mean ± SD | 46.50 ± 8.84 |
| Training on medication error prevention (%) | 337 (48.0) |
| Training on sharp object injury prevention (%) | 362 (51.6) |
| Burnout syndrome | 0 |
| Burnout dimensions | |
| High emotional exhaustion (EE score > 26) | 190 (27.1) |
| High depersonalization (DP score > 12) | 93 (13.3) |
| Low personal accomplishment (PA score < 32) | 1 (0.1) |

Data are presented as number (%) and mean ± SD

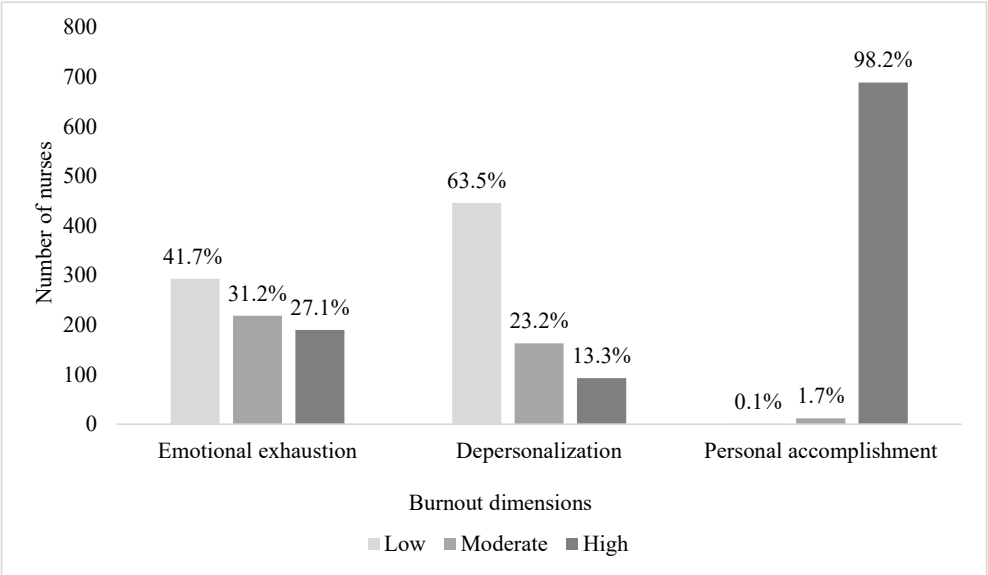


**Figure 1.** Prevalence of burnout among inpatient nurses, n=702

**Table 2.** Number and percentage of self-reported medication errors and sharp object injuries by burnout dimensions

| Factors | Medication errors | | *p*-value | Sharp object injuries | | *p*-value |
|---|---|---|---|---|---|---|
| | Yes (n=192) | No (n=510) | | Yes (n=39) | No (n=663) | |
| Emotional exhaustion | | | | | | |
| Low | 55 (18.8) | 238 (81.2) | < 0.001 | 7 (2.4) | 286 (97.6) | 0.008 |
| Moderate | 66 (30.1) | 153 (69.9) | | 17 (7.8) | 202 (92.2) | |
| High | 71 (37.4) | 119 (62.6) | | 15 (7.9) | 175 (92.1) | |
| Depersonalization | | | | | | |
| Low | 102 (22.9) | 344 (77.1) | 0.002 | 21 (4.7) | 425 (95.3) | 0.419 |
| Moderate | 58 (35.6) | 105 (64.4) | | 11 (6.7) | 152 (93.3) | |
| High | 32 (34.4) | 61 (65.6) | | 7 (7.5) | 86 (92.5) | |
| Personal accomplishment | | | | | | |
| Low | 0 | 1 (100) | 0.582 | 0 | 1 (100) | 0.677 |
| Moderate | 2 (16.7) | 10 (83.3) | | 0 | 12 (100) | |
| High | 190 (27.6) | 499 (72.4) | | 39 (5.7) | 650 (94.3) | |

Data are presented as number (%) and mean ± standard deviation
The *p* values correspond to Student's t-test, Fisher's exact test, and Pearson's chi-squared test

the obstetrics and gynecology ward to 122.4% in the emergency observation ward.

Regarding safety outcomes, 27% of inpatient nurses (n=192) reported having made medication errors and 6% (n=39) reported sharp object injuries in the last year. A higher proportion of the nurses who reported medication errors and those who reported sharp object injuries also had a higher incidence of moderate or high emotional exhaustion levels (Table 2). The number of medication errors and sharp object injuries reported in the IOR system during the same period were 329 and 51 incidents, respectively. The mean number of system-reported medication errors was 4.8 (SD = 6.2), with a range of 0-28. The mean number of system-reported sharp object injuries was 0.75

**Table 3.** Odds ratio (OR) for association of medication error and sharp object injury with burnout dimensions

| Burnout dimensions | Medication error (n=192) | | Sharp object injury (n=39) | |
|---|---|---|---|---|
| | Crude OR (95%CI) | Adjusted* OR (95%CI) | Crude OR (95%CI) | Adjusted** OR (95%CI) |
| Emotional exhaustion (level) | | | | |
| High | 2.54 (1.66-3.88)+ | 1.90 (1.12-3.21)+ | 3.48 (1.38-8.76)+ | 3.12 (1.23-7.92)+ |
| Moderate | 1.85 (1.22-2.80)+ | 1.63 (1.04-2.56)+ | 3.45 (1.40-8.51)+ | 3.29 (1.33-8.15)+ |
| Low | 1.00 | 1.00 | 1.00 | 1.00 |
| Depersonalization (level) | | | | |
| High | 1.74 (1.06-2.86)+ | 1.04 (0.56-1.95) | 1.65 (0.67-3.10) | N/A |
| Moderate | 1.82 (1.22-2.73)+ | 1.39 (0.89-2.18) | 1.44 (0.67-3.10) | N/A |
| Low | 1.00 | 1.00 | 1.00 | N/A |
| Personal accomplishment (level) | | | | |
| High | 1.00 | N/A | N/A | N/A |
| Moderate | 0.54 (0.11-2.54) | N/A | N/A | N/A |
| Low | N/A | N/A | N/A | N/A |

+Significant at $p < 0.05$

*Adjusted for age, marital status, level of education, income, nursing experience, shift work, number of night shift per month, training on sharp object injury prevention (according to $p < 0.15$)

**Adjusted for marital status, shift work (according to $p < 0.15$)

N/A: not applicable

(SD = 1.1) and had a range of 0-4.

The mixed logistic regression results of the association of burnout with self-reported medication errors and self-reported sharp object injuries are presented in Table 3. In multivariable analysis, emotional exhaustion was found to be significantly associated with both self-reported medication errors and sharp object injuries. Moderate and high emotional exhaustion were both significantly associated with increased odds of self-reported medication errors (ORadj 1.63 and 1.90, respectively) as well as self-reported sharp objects injuries (ORadj 3.29 and 3.12, respectively).

Additional analysis using IOR of the association of sharp object injuries and average burnout score showed that a one-point increase in the seven-point Likert scale for emotional exhaustion was significantly associated with a 15% increase in system-reported sharp object injuries after adjusting for nurse-to-bed ratio, type of inpatient ward, and bed occupancy rate (IRR 1.15;95%CI 1.06-1.26, Table 4).

## Discussion

The present study found that one in four nurses had a high level of emotional exhaustion and about one in ten nurses reported high depersonalization although only one nurse reported experiencing a feeling of low personal accomplishment. This predominance of the emotional exhaustion dimension is consistent with a previous study among nurses in academic medical centers in Iran (20). It has been suggested that emotional exhaustion is a core dimension of burnout and that it is the most obvious manifestation of this complex syndrome (21). When people describe themselves as experiencing burnout, they often are referring to a feeling of exhaustion. However, the high burnout in each of the three dimensions found in this study is lower than in a previous study of nurses in community hospitals (8) and lower than an earlier survey of staff nurses in a teaching hospital in Thailand (22). A possible explanation for these differences is that high workload and extended work hours are more common in community hospitals (23). In addition, it is

**Table 4.** Incidence rate ratio (IRR) for association of medication error and sharp object injury with burnout dimensions

| Burnout dimensions | Medication error (n=329) | | Sharp object injury (n=51) | |
|---|---|---|---|---|
| | Crude IRR (95%CI) | Adjusted* IRR (95%CI) | Crude IRR (95%CI) | Adjusted* IRR (95%CI) |
| Emotional exhaustion | 1.07 (1.01-1.13)+ | 1.06 (0.99-1.13) | 1.11 (1.03-1.19)+ | 1.15 (1.06-1.26)+ |
| Depersonalization | 1.05 (0.95-1.16) | 0.94 (0.87-1.09) | 1.04 (0.95-1.15) | 0.94 (0.84-1.06) |
| Personal accomplishment (score, continuous) | 1.13 (1.01-1.26)+ | 1.11 (1.01-1.24)+ | 1.02 (0.11-3.21) | 0.94 (0.82-1.07) |

+ Significant at $p$ value < 0.05

* Adjusted by nurse-to-bed ratio, bed occupancy rate, type of inpatient ward

possible that burnout in the teaching hospital which is the subject of this study had been reduced by improved working conditions resulting from the quality improvement programs regularly instituted by the hospital over almost the past 30 years.

Our study found that the number of self-reported medication errors and sharp object injuries were lower than the figures obtained from the incident reporting system (medication errors 192 vs. 329 and sharp object injuries 39 vs. 51). This differs from several other studies in which the numbers of errors recorded in the incident reporting system were usually underestimated (24,25). However, the self-reported numbers in the present study might be lower than the actual number because the yes-no question format in the questionnaire did not account for nurses who might have made medication errors and/or had sharp object injuries more than once. Also, the missing data in the non-response group could have resulted in a decrease in the number of self-reported safety outcomes.

This study highlights the impact of nurse burnout on medication errors and sharp object injuries. These results are consistent with several previous studies. For example, a study among nurses in Thailand by Nantsupawat et al. reported that a high level of burnout resulting from emotional exhaustion was associated with the nurses' perceptions of adverse patient outcomes, especially medication errors (8). Research previously conducted among nurses in China by Wang et al. found that emotional exhaustion was positively correlated with the occurrence of sharp object injuries (9). That relationship may be explained by the conservational of resource theory which states that when peoples' resources are exhausted, they may enter a defensive mode to preserve themselves and may alter their investment of future resources (26). When nurses feel exhausted, they may be more likely to pull away from the job, including patients, and may focus only on the parts of the job they like which may lead to a lower quality of healthcare. Another possible explanation is that burnout symptoms may be related to cognitive dysfunction (27), attention deficit (28), and insomnia (27). In addition, the relationship between burnout and sharp object injuries may also be partially explained by the positive association between burnout and safety workaround (29), an alternative work process that bypasses required organizational safety procedures or rules, violations of safety procedures that are one of the causes of accidents at work.

This study explored the association between burnout and safety outcomes among nurses in a teaching hospital. The researcher assessed medication errors and sharp object injury incidents using self-reported questionnaires and incident occurrence reports (IORs). However, the cross-sectional design of the study does not confirm a causal link between variables. The research setting for this study was only one tertiary care institution;nevertheless, the results may be applicable to other large hospitals with similar characteristics and working process.

## Conclusions

This study indicates that emotional exhaustion is a substantial problem among inpatient nurses and that it has a significant impact on patient and personnel safety. Identifying nurses with emotional exhaustion and providing appropriate support, including discussing mental health factors as part of Root Cause Analysis (RCA) should be considered for inclusion in policies to promote safety in healthcare services.

## Acknowledgements

The authors would like to acknowledge the nurse supervisors at Ramathibodi Hospital from the Main Building, Somdech Phra Debaratana Medical Center, and Queen Sirikit Medical Center, for their cooperation and for providing permission to collect the data. We would also like to thank all of the participants for generously taking time to prove information for this study.

## Funding

None

## Conflicts of interest

The authors certify that there are no conflicts of interest.

## References

1. Healthcare Accreditation Institute Information. Patient safety goals: SIMPLE Thailand 2018 [Internet]. Nonthaburi: Healthcare Accreditation Institute; c2019 [updated 2019] [cited 2020 Jan 20]. Available from: http://mrd-hss.moph.go.th/mrd1_hss/wp-content/uploads/2019/05/safety-goals.pdf
2. Fathi A, Hajizadeh M, Moradi K, Zandian H, Dezhkameh M, Kazemzadeh S, et al. Medication errors among nurses in teaching hospitals in the west of Iran: what we need to know about prevalence, types, and barriers to reporting. Epidemiol Health. 2017;39:1-7.
3. Salmasi S, Khan TM, Hong YH, Ming LC, Wong TW. Medication errors in the Southeast Asian countries: a systematic review. PloS one. 2015;10:1-19.
4. World Health Organization. Medication without harm - global patient safety challenge on medication safety. Geneva, Switzerland: World Health Organization;2017.
5. Sharps Safety for Healthcare Settings | CDC [Internet]. Cdc.gov;2020 [cited 2020 Nov 26]. Available from: https://www.cdc.gov/sharpssafety/index.html
6. Honda M, Chompikul J, Rattanapan C, Wood G, Klungboonkrong S. Sharps injuries among nurses in a Thai regional hospital: prevalence and risk factors. Int J Occup Environ Med. 2011;2:215-23.
7. Reason J. Human error: models and management. BMJ. 2000;320(7237):768-70.
8. Nantsupawat A, Nantsupawat R, Kunaviktikul W, Turale S, Poghosyan L. Nurse burnout, nurse-reported quality of care, and patient outcomes in Thai hospitals. J Nurs Scholarsh. 2016;48:83-90.
9. Wang S, Yao L, Li S, Liu Y, Wang H, Sun Y. Sharps injuries and job burnout: a cross-sectional study among nurses in China. Nurs Health Sci. 2012;14:332-8.
10. World Health Organization (WHO). Burn-out an "occupational phenomenon": International classification of diseases [Internet]. Geneva, Switzerland: World Health Organization; 2019 [updated 2019] [cited 2019 Oct 30]. Available from: https://www.who.int/mental_health/evidence/burn-out/en
11. Maslach C, Jackson SE, Leiter MP, Schaufeli WB, Schwab RL. Maslach burnout inventory. Palo Alto (CA): Consulting Psychologists Press; 1986.
12. Aiken LH, Sloane DM, Clarke S, Poghosyan L, Cho E, You L, et al. Importance of work environments on hospital outcomes in nine countries. Int J Qual Health Care. 2011;23:357-64.
13. AHRQ Patient Safety Network [Internet]. Rockville (MD): Agency for Healthcare Research and Quality; 2015. Burnout among health professionals and its effect on patient safety: Annual perspective 2015;2015 [cited 2019 Oct 30]; [about 3 screens]. Available from: https://psnet.ahrq.gov/perspective/burnout-among-health-professionals-and-its-effect-patient-safety.
14. Hall LH, Johnson J, Watt I, Tsipa A, O'Connor DB. Healthcare Staff Wellbeing, Burnout, and Patient Safety: A Systematic Review. PLoS One. 2016;11:e0159015.
15. Bujang MA, Sa'at N, Sidik T, Joo LC. Sample size guidelines for logistic regression from observational studies with large population: emphasis on the accuracy between statistics and parameters based on real life clinical data. Malays J Med Sci. 2018;25:122-30.
16. Mental Health Center 7. Burnout questionnaire for healthcare personnel: the development of the burnout protection reinforcement system including care for the public health officers in the Mental Health Center 7 [Internet]. Khon Kaen: Mental Health Center 7;2017 [cited 2020 Jan 14];[about 3 screens]. Available from: http://mhc7.go.th/wp-content/uploads/2017/09/แบบประเมินภาวะหมดไฟ-ฉบับเผยแพร่.pdf [in Thai]
17. About medical errors | NCC MERP [Internet]. [place unknown]: NCC MERP;c2019. About medication errors: What is a medication error?;c2019 [cited 2019 Oct

30];[about 1 screen]. Available from: https://www.nccmerp.org/about-medication-errors
18. Heath and social care services - sharps injuries [Internet]. [place unknown]: Health and Safety Executive;2019 [cited 2019 Oct 30];[about 2 screens]. Available from: http://www.hse.gov.uk/healthservices/needlesticks/
19. Bursac Z, Gauss CH, Williams DK, Hosmer D. A purposeful selection of variables macro for logistic regression. Source Code Biol Med. 2007;173:1-5.
20. Moghaddasi J, Mehralian H, Aslani Y, Masoodi R, Amiri M. Burnout among nurses working in medical and educational centers in Shahrekord, Iran. Iran J Nurs Midwifery Res. 2013;18:294-7.
21. Maslach C, Schaufeli WB, Leiter MP. Job burnout. Annu Rev Psychol. 2001;52:397-422.
22. Summawart S. Burnout among the staff nurses in Ramathibodi hospital (master's thesis). Nakon Pathom: Mahidol University; 1989. p. 87.
23. Nantsupawat A, Nantsupawat R, Kulnaviktikul W, McHugh MD. Relationship between nurse staffing levels and nurse outcomes in community hospitals, Thailand. Nurs Health Sci. 2015;17:112-8.
24. Hajibabaee F, Joolaee S, Peyravi H, Alijany-Renany H, Bahrani N, Haghani H. Medication error reporting in Tehran: a survey. J Nurs Manag. 2014;22:304-10.
25. Kiymaz D, Koc Z. Identification of factors which affect the tendency towards and attitudes of emergency unit nurses to make medical errors. J Clin Nurs. 2018;27:1160-9.
26. Hobfoll SE, Halbesleben J, Neveu J-P, Westman M. Conservation of resources in the organizational context: the reality of resources and their consequences. Annu Rev Organ Psychol Organ Behav. 2018;5:103-28.
27. Rudman A, Arborelius L, Dahlgren A, Finnes A, Gustavsson P. Consequences of early career nurse burnout: A prospective long-term follow-up on cognitive functions, depressive symptoms, and insomnia. EClinicalMedicine. 2020;27:1-10.
28. Linden DVD, Keijsers GPJ, Eling P, Schaijk RV. Work stress and attentional difficulties: an initial study on burnout and cognitive failures. Work Stress. 2005;19:23-36.
29. Halbesleben JR. The role of exhaustion and workarounds in predicting occupational injuries: a cross-lagged panel study of health care professionals. J Occup Health Psychol. 2010;15:1-16.

## ความสัมพันธ์ระหว่างภาวะเหนื่อยหน่ายในการทำงานของพยาบาลประจำหอผู้ป่วยและผลลัพธ์ด้านความปลอดภัย ของโรงพยาบาลโรงเรียนแพทย์แห่งหนึ่งในประเทศไทย

ชนม์นิภา วิฑูรสูตร,[1] วิชัย เอกพลากร,[1] ณัฐธิดา ไพรพยอม[2] และ ฉัฐญาณ์ วงศ์รัฐนันท์[1]
[1]ภาควิชาเวชศาสตร์ชุมชน, [2]งานอาชีวอนามัย ความปลอดภัยและสิ่งแวดล้อม คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล

**วัตถุประสงค์** เพื่อศึกษาความชุกของภาวะความเหนื่อยหน่ายในการทำงานของพยาบาลประจำหอผู้ป่วย และความสัมพันธ์ระหว่างภาวะเหนื่อยหน่ายในการทำงานกับความผิดพลาดทางยาและอุบัติเหตุจากของมีคม ทั้งจากแบบรายงานตนเองและจากระบบรายงานอุบัติการณ์ (IOR)

**วิธีการ** การศึกษาแบบภาคตัดขวางในพยาบาลประจำหอผู้ป่วย 1,464 คน ของโรงพยาบาลโรงเรียนแพทย์แห่งหนึ่ง เก็บข้อมูลโดยใช้แบบสอบถามรายงานตนเอง ซึ่งประกอบด้วย 1) ข้อมูลส่วนบุคคล 2) แบบประเมินภาวะเหนื่อยหน่ายในการทำงาน 3) ข้อมูลการรายงานตนเองด้านความผิดพลาดทางยาและอุบัติเหตุจากของมีคม รวมทั้งเก็บข้อมูลอุบัติการณ์ย้อนหลัง 1 ปี จากระบบ IOR วิเคราะห์ความสัมพันธ์โดยใช้การวิเคราะห์ถดถอยโลจิสติกแบบผสมและการวิเคราะห์ถดถอยทวินามเชิงลบ

**ผลการศึกษา** มีพยาบาลประจำหอผู้ป่วย 702 คน เข้าร่วมการศึกษานี้ ผลการศึกษาพบว่า พยาบาลประจำหอผู้ป่วยมีคะแนนด้านความอ่อนล้าทางอารมณ์และด้านการลดความเป็นบุคคลอยู่ในระดับสูง ร้อยละ 27 และร้อยละ 13 ตามลำดับ ทั้งนี้ มีพยาบาลเพียงหนึ่งท่านที่มีคะแนนด้านความสำเร็จส่วนบุคคลอยู่ในระดับต่ำ โดยความอ่อนล้าทางอารมณ์ในระดับสูง มีความสัมพันธ์กับความผิดพลาดทางยาและอุบัติเหตุจากของมีคมจากแบบรายงานตนเอง อย่างมีนัยสำคัญทางสถิติ (ORadj 1.90, 95%CI 1.1-3.2 และ ORadj 3.12, 95%CI 1.2-7.9 ตามลำดับ) และทุก ๆ 1 คะแนน ด้านความอ่อนล้าทางอารมณ์ที่เพิ่มขึ้น อัตราการรายงานอุบัติการณ์ด้านอุบัติเหตุจากของมีคมในระบบ IOR เพิ่มขึ้นร้อยละ 15 อย่างมีนัยสำคัญทางสถิติ ($p < 0.05$)

**สรุป** ความอ่อนล้าทางอารมณ์สามารถพบได้ในพยาบาลประจำหอผู้ป่วย และมีผลกระทบต่อความปลอดภัยของทั้งผู้ป่วยและพยาบาล ดังนั้น การค้นหาพยาบาลที่มีความอ่อนล้าทางอารมณ์และดำเนินการช่วยเหลือ อาจถูกพิจารณาเป็นหนึ่งในนโยบายเพื่อส่งเสริมความปลอดภัยในสถานพยาบาล **เชียงใหม่เวชสาร 2564;60(3):325-34. doi: 10.12982/CMUMEDJ.2021.29**

**คำสำคัญ:** ภาวะเหนื่อยหน่ายในการทำงาน พยาบาลประจำหอผู้ป่วย ความผิดพลาดทางยา อุบัติเหตุจากของมีคม ผลลัพธ์ด้านความปลอดภัย