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Impact of nurses' burnout on safety culture

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ABSTRACT

Literature indicates that burnout emphasizes its implication in the development of safety issues governing healthcare providers with physical and mental exhaustion associated with it. This study advocated determining burnout and its possible effect on key performance indicators on patient safety outcomes and in the eventual recommendation of preventive actions in policies governing nursing practice. Specifically, it ventured to determine the relationship between nurses' burnout and their compliance with safety outcomes. A quantitative correlational study was designed to determine 274 purposive samples of registered nurses from participating government and non-government hospitals in Tarlac and Pampanga, Philippines towards their burnout and its relationship on key performance indicators on patient safety outcomes. Data were collected through two standardized self-administered questionnaires, Oldenburg Inventory Scale and the Key Performance Indicators on Patient Safety Outcomes Questionnaire, between February and May 2020. The study revealed that nurses, with a mean age of 27.86 (SD±4.81) years, experienced burnout due to work disengagement (18.10±2.812) and exhaustion (19.81±2.910). Safety guidelines on patient outcomes related to blood management (3.74±0.538) and fall prevention (3.15±0.468) received the highest mean scores with pressure ulcer management (2.82±0.597), the lowest. The study found several significant correlations between nurses' disengagement, exhaustion, and total burnout with their overall safety culture (r=0.321, p=0.000; r=-0.225, p=0.003). All identified relationships showed a negative correlation suggesting that higher burnout scores are significantly related to lower safety culture scores. Nurses' ability to provide standard-based measures in upholding safety as a priority can be compromised at a considerable level. Recognizing the role of nurses' well-being in healthcare, policymakers should not only emphasize the need for evidence-based, quality, and safe interventions but also investigate the nurses' work conditions and contributory factors for burnout.

1. Introduction

While it has been pointed out as one of the most stressful occupations since its inception, the nursing profession's service-oriented feature places nurses on a significant strain on their capacity to tolerate pressures that represent the major challenges to healthcare practice and quality of care (Harizanova et al., 2018; Carta et al., 2017; Elbarazi et al., 2017). Explored in much detail, burnout's causation and management among healthcare workers had been a subject for exploration, and attempts emerged to address this concern. The literature emphasizes psychophysical exhaustion, reduced professional achievement, and cynicism as three major dimensions of burnout where the ultimate effects can be summarized into decreased job performance and poor patient care and that both healthcare workers and patients are situated at a disadvantageous position (Dutton and Kozachik, 2020; Elbarazi et al., 2017; Galletta et al., 2016).

While it has been pointed out as one of the most stressful occupations since its inception the nursing profession's service-oriented feature places nurses on a significant strain on their capacity to tolerate pressures that represent the major challenges to healthcare practice and quality of care (Harizanova et al., 2018; Carta et al., 2017; Elbarazi et al., 2017). Explored in much detail, burnout's causation and management among healthcare workers had been a subject for exploration, and attempts emerged to address this concern. The literature emphasizes psychophysical exhaustion, reduced professional achievement, and cynicism as three major dimensions of burnout where the ultimate effects can be summarized into decreased job performance and poor patient care and that both healthcare workers and patients are situated at a disadvantageous position (Dutton and Kozachik, 2020; Elbarazi et al., 2017; Galletta et al., 2016).

2. Methods

A correlational study was conducted to determine nurses' burnout and its possible relationship to key performance indicators on patient safety outcomes. This design is appropriately utilized to examine relationships between these identified variables (Polit and Beck, 2008).

2.1. Sample and setting

Utilizing G-power analysis, a total of 274 purposive sample nurses were included from the target population with a mean age of 27.86 years old (SD$\pm$4.81) (Uttley, 2019). Nurses were collected from both government and non-government participating hospitals in Tarlac and Pampanga, Philippines. Meanwhile, inclusion criteria encompassed nurses:

a. with at least a year of clinical experience regardless of their age, nationality, civil status, and current position
b. are currently employed in the participating hospitals regardless of assigned areas in the workplace, and
c. who voluntarily agreed to participate in the study

However, the exclusion criteria consisted of nurses:

a. who practice in other fields of nursing; and
b. who refuse to participate in the conduct of the research

2.2. Measurement/instrument

Using two standardized self-administered questionnaires, the study evaluated nurses both their burnout and the key performance indicators on patient safety outcomes. The 16-item Oldenburg Inventory Scale was used to assess nurse's burnout while the 40-item Key Performance Indicators on Patient Safety Outcomes Questionnaire, adapted from the Australian Clinical Healthcare Standards on key performance indicators for patient safety outcomes, was likewise utilized to reveal nurses' standards on medication safety, infection control, pressure ulcer management, fall prevention, and blood management (Fotovatfard and Heravi, 2021; Demerouti et al., 2003). With these standardized questionnaires, respondents can rate their burnout and key performance indicators on patient safety outcomes using a Likert-type scale with varying levels of agreement/disagreement (Oldenburg Inventory Scale); and frequency levels of experience (Key performance indicators on patient safety outcomes).

Utilizing 16-item Oldenburg Inventory Scale with its two domains – disengagement and exhaustion, resulting in the description of nurses' burnout relative to the statements under each domain. About the instrument's scoring guide, positive statements for both disengagement and exhaustion were scored as 1 (strongly agree), 2 (agree), 3 (disagree), and 4 (strongly disagree) while the negative ones are scored as 4 (strongly agree), 3 (agree), 2 (disagree) and 1 (strongly disagree). This suggested therefore that higher scores on this instrument reflect the higher experience of burnout in terms of each statement and domain and overall score. The possible total score for computation of burnout in consideration of the two domains ranges between 16 and 64.

2.3. Data collection procedure

Permission from the nursing services directors of all covered hospitals through communication letters is required to commence data collection. Data were collected from 27th February to 12th May 2020 with a purposive sample of nurses from the Philippine government and non-government participating hospitals (e.g., Tarlac and Pampanga) who willingly participated in the study by completely answering distributed questionnaires. Enough time is given for at least 10-15 minutes to answer distributed questionnaires. Aside from the principal investigator (PI), all co-principal investigators (Co-PI) distributed, retrieved, and checked questionnaires for completeness and eligibility for data tallying and processing. All identified incomplete questionnaires were not included in the study.

2.4. Data analysis

Using IBM SPSS v.21, the study employed Pearson product-moment correlation other than frequency and percentage distributions to determine the relationship between burnout and key performance indicators on patient safety outcomes of nurses. A p-value level of statistical significance of <0.05, 0.01, and 0.001 were considered.

3. Results

3.1. Nurses' burnout

Table 1 shows nearly equal total scores for each domain (disengagement: x̄=18.10, SD±2.812; exhaustion: x̄=19.81, SD±2.910; total burnout score: x̄=37.91, SD±5.286). It reveals the highest mean scores (higher experience of disengagement) and were noted on being sickened with work tasks (statement 11: x̄=2.65, SD±0.703), depletion of emotional energy leading in decreased thinking and cognitive fatigue allowing for the performance of job almost mechanically (statement 6: x̄=2.57, SD±0.639), and feeling of disconnection from work (statement 9: x̄=2.55, SD±0.781). On the positive note, nurses generally experience low disengagement evidenced by the lowest mean scores

on finding increased engagement through new work interests (statement 1: x̄=1.68, SD±0.625) for which some are regarded as positively challenging (statement 7: x̄=1.75, SD±0.581).

Referring to exhaustion as the second domain of burnout, it can generally be perceived that nurses feel tired even before arriving at work (statement 2: x̄=3.19, SD±0.593), need more time for relaxation to feel better (statement 4: x̄=2.94, SD±0.773), and usually feel worn out and weary (statement 12: x̄=2.72, SD±0.685) through the reflected highest mean scores (high experience of exhaustion) on this domain of burnout. Meanwhile, le, lowest mean scores (low experience of exhaustion) reveal that nurses tolerate the pressure of work (statement 5: x̄=1.91, SD±0.601) and usually manage well a significant amount of work (statement 14: x̄=1.91, SD±0.496), a reflection of being able to cope up despite adversities.

Table 1: Nurses' burnout (n=274)

Domains and statements	Mean (x̄)	Standard deviation (SD)
Disengagement		
11. Sometimes I feel sickened by my work tasks *	2.65	0.703
6. Lately, I tend to think less at work and do my job almost mechanically *	2.57	0.639
9. Over time, one can become disconnected from this type of work *	2.55	0.781
3. It happens more and more than that I talk about my work negatively *	2.49	0.735
13. This is the only type of work that I can imagine myself doing	2.49	0.872
15. I feel more and more engaged in my work	1.93	0.589
7. I find my work to be a positive challenge	1.75	0.581
1. I always find new and interesting aspects of my work	1.68	0.625
Disengagement score	**18.10**	**2.812**
Exhaustion		
2. There are days when I feel tired before I arrive at work *	3.19	0.593
4. After work, I tend to need more time than in the past too, and feel better *	2.94	0.773
12. After work I usually feel worn out and weary *	2.72	0.685
8. During my work, I often feel emotionally drained *	2.48	0.735
10. After working I have enough energy for my leisure activities	2.59	0.738
16. When I work, I usually feel energized	2.07	0.618
5. I can tolerate the pressure of my work very well	1.91	0.601
14. Usually, I can manage the amount of my work well	1.91	0.496
Exhaustion score	**19.81**	**2.910**
Total Burnout score	**37.91**	**5.286**

*: Negative statements

3.2. Nurses' safety culture

Table 2 presents the respective composite means of every domain where safety guidelines on patient outcomes related to blood management (x̄=3.74, SD±0.538) and fall prevention (x̄=3.15, SD±0.468) received the highest mean scores. Meanwhile, safety outcomes related to pressure ulcer management had been assigned the lowest mean score (x̄=2.82, SD±0.597).

Table 2: Nurses' safety culture (n=274)

Domains	Mean (x̄)	Standard deviation (SD)
Blood management	3.74	0.538
Fall prevention	3.15	0.468
Medication safety	3.03	0.381
Infection control	3.02	0.405
Pressure ulcer management	2.82	0.597
Overall safety culture mean	3.15	0.269

Safety culture domains with higher mean scores suggest higher compliance on these key performance indicators for patient safety outcomes. Compliance with blood management guidelines reinforces the

idea that nurses generally check patient-identifier before transfusion, obtaining informed consent, indication for transfusion about hemoglobin levels, and documentation of adverse effects, possibly expired, damaged, or unused blood units, or those products with inappropriate storage or transportation. Compliance with fall prevention, as an indicator of patient-safety outcomes, is measured in terms of the provision of fall risk assessment and "at-risk" labeling with injury prevention devices. It also compromises negative indicators related to the experience of slips, trips, and falls specifically in terms of frequency, age of involved adults, and the presence of disability consequently.

Meanwhile, lower mean scores on some domains indicate lower than usual compliance on the key performance indicators for patient safety outcomes specifically related to medication safety, infection control, and pressure ulcer management. Compliance with the guidelines related to medication safety encompasses negative indicators such as the experiences of a near-miss medication

error, incident reporting related to a medication error, death of patients due to preventable adverse drug effects, and greater length of patient confinement than the required number of days per case, cancellation or delay of procedures and administration of an antidote to counteract medication error due to medication issues.

Other indicators related to compliance with medication safety include reporting and alleviation of adverse effects related to medication use, implementation of recommendations to promote patient safety, legible handwriting during medication charting, and provision of home discharge orders related to the medication regimen. On the other hand, infection control guidelines include compliance with hospital cleanliness audit and control recommendations, attending annual infection control training, and compliance with review and follow-up. Negative indicators for this domain include incidents of accidental needle stick due to recapping, and body fluid and percutaneous occupation exposures. The lowest mean score was noted on pressure ulcer management suggesting lower than usual compliance related to the placement of risk assessment for pressure ulcers and a negative indicator such as the development of pressure ulcers in varying stages or more severe forms.

3.3. Correlation of nurses' burnout and their safety culture

As to whether nurses' burnout influences their compliance with patient safety outcomes or not is shown in Table 3. A Pearson product-moment correlation determined the relationship between nurses' burnout and safety culture along with specific domains. There was a weak, positive correlation between nurses' total burnout and overall safety culture scores, which was statistically significant (r= 0.294; p=0.000).

Additionally, it had been found that there was a statistically significant correlation between nurses' disengagement, as a variable of burnout and their safety culture scores on infection control (r=-0.302; p=0.000), pressure ulcer management (r=-0.217; p=0.004), fall prevention (r=0.279; p=0.000), and overall safety culture (r=0.321; p=0.000). Meanwhile, nurses' exhaustion showed a statistically significant correlation with their overall safety culture scores (r=-0.225; p=0.003), specifically on infection control (r=-0.236; p=0.002) and fall prevention (r=-0.204; p=0.007). Lastly, nurses' total burnout score was statistically significant on infection control (r=-0.290; p=0.000), pressure ulcer management (r=-0.214; p=0.015), and fall prevention (r=-0.261; p=0.001). All identified relationships showed a negative correlation suggesting that higher burnout scores are significantly related to lower safety culture scores.

4. Discussion

While burnout can be generally featured to encompass psychophysical exhaustion, a lack of connection to the workplace atmosphere can greatly affect interpersonal relations and teamwork (Galletta et al., 2016). The relative lack of energy to perform expected functions caused by a significant decline in enthusiasm and eagerness not only reduces job satisfaction but also provides very limited opportunities for effective nurse-patient interactions.

Table 3: Correlation of nurses' burnout and their safety culture (n=274)

Nurses' burnout domains	Nurses' safety culture domains					
$\bar{x}\pm SD$	Medication safety 3.03±0.381	Infection control 3.02±0.405	Pressure ulcer management 2.82±0.597	Fall prevention 3.74±0.538	Blood management 3.15±0.269	Overall safety culture 3.15±0.269
	p-value/Pearson correlation (r)					
Disengagement	0.079	0.000***	0.004**	0.000***	0.987	0.000***
18.10 (2.812)	-0.133	-0.302	-0.217	-0.279	0.001***	-0.321
Exhaustion	0.765	0.002**	0.098	0.007**	0.491	0.003**
19.81 (2.910)	-0.023	-0.236	-0.126	-0.204	-0.053	-0.225
Overall burnout	0.273	0.000***	0.015*	0.001***	0.711	0.000***
37.91 (5.286)	-0.084	-0.290	-0.214	-0.261	-0.028	-0.294

Mean ($\bar{x}$); standard deviation (SD); p-0.05*; p-0.01**; p-0.001***

The prolonged response to the indefatigable emergence of complex work tasks can significantly lead to emotional and physical exhaustion and indifference to the job, colleagues, and the institution commonly referred to as cynicism. This situation proves to be disadvantageous for both parties secondary to nurses' disengagement and exhaustion (Dutton and Kozachik, 2020). Those who are more affected by work stressors have a more negative safety culture that compromises the quality of provided care (Carneiro et al., 2021). Additionally, the synergy emanating from teamwork cannot be utilized as some members of the team do not invest similar dedication to creating effective, efficient, and goal-oriented nursing care measures.

As an occupational phenomenon, burnout is a serious health issue and its prevalence among nurses warrants attention, policy change, and implementation (Woo et al., 2020; Rezaei et al., 2018). Reframing burnout as collective and organizational approaches to this concern in broader perspectives (Jun et al., 2021). Being able to detect, address, mitigate and prevent burnout is a key initiative to ensure that nurses' morale is protected, and turnover intention is reduced (Kleinpell et al., 2020). To address burnout, resiliency should be

improved (Elbarazi et al., 2017). The ultimate value of resilience-building programs is to facilitate nurses' successful coping despite workplace adversities (Profit et al., 2014). As nurses are found to be more engaged in work through new challenges and interests, the workplace environment must possess supportive characteristics that are dynamic and responsive to the needs of the nurses. Healthcare organizations can significantly reduce burnout when the work environment has been improved at the organizational level, thereby reducing negative patient safety performance (Montgomery et al., 2022). The service-oriented feature of the profession, while it already creates enormous demand among nurses to provide only quality and safe care, should investigate policies and guidelines that protect them from exhaustion and disengagement at work (Caramanzana, 2020; Feliciano et al., 2020).

As burnout leads to interpersonal conflicts and it is through connecting with colleagues can the barriers to building compassion and satisfaction be eliminated, the emotional impact of burnout is shared among them as they too may experience the same adversity (Balinbin et al., 2020). On a similar note, burnout reduces and impairs nurse-patient interaction owing to excessive administrative tasks that must be met during working hours (Caramanzana, 2020). As a key strategy towards self-fulfillment, connecting with patients through transpersonal caring relationships reinforces the profession's main therapeutic tool. Empowerment strategies and management of dysfunctional working environments are key solutions in promoting staff morale and reducing burnout among workers as in the case of inadequate staffing as an important predictor of nurses' burnout (Galletta et al., 2016; Zarei et al., 2016).

Part of the competency-building is to ensure that common grounds for malpractice in healthcare settings in form of falls, mismatched transfused blood products, medication errors, and the development of irresponsible nosocomial or iatrogenic infections are addressed and regularly evaluated among nurses who are in constant experience of the procedures. While the nursing care related to the transfusion of blood products does not only specify actual infusion, the critical compliance of nurses on blood transfusion protocols ensures efficient identification and management of any potential transfusion reactions. The process entails indication-matching with the patient's case, request of a specified blood product, strict compliance with blood product and patient verification, informed consent, transfusion guidelines, reporting and management of adverse reactions, and storage of the used product. Meanwhile, fall precautionary measures are placed within bundles of care to ensure that nurses are directed towards a standardized pathway of practice to ensure that only evidence-based measures are incorporated. While there are several medication guidelines related to procurement, storage, preparation, administration,

documentation, and monitoring, medication errors contribute not only to unnecessarily prolonged patient stays in the hospital but also to the need for the hospital to shoulder incurred costs along with possible development of patient complications. A patient's physical dependency, while it increases the risk for pressure ulcer development, should be addressed as part of the risk assessment of patients who are admitted to the hospital.

The practices enveloped within these patients' safety outcomes should be performed diligently and can tremendously require a nurse's time, energy, competency, and focus among all other responsibilities that wait in the service-oriented nature of the profession. To establish a safety culture, nurses engage with the patients and their families, check and review procedural guidelines, learn from errors, and cultivate effective communication with the healthcare team. Nurse managers should cultivate a safety culture aligned with appropriate values to imbed among nurses the desired safety behaviors (Hu et al., 2021).

Excessive workload related to staffing issues and adverse job characteristics are important predictors of nurses' burnout (Dall'Ora et al., 2020). The required skills and amount of workload over a given period can be distressing to available nurses who are understaffed (Diehl et al., 2021). Burnout is negatively correlated with patient safety climate and issues related to prolonged hospitalization and unnecessary preventable costs emerge (Zarei et al., 2016). Chronic exhaustion related to physical and emotional aspects diminished performance and accuracy increasing the risk of non-compliance with safety standards.

Staff profiling is an initial step toward the primary preventive aspect of identifying persons at risk and providing them with wellness and coping programs to alleviate factors leading to burnout (Elbarazi et al., 2017). Nurses who exhibit emotional maturity and have a better physical sense of well-being tend to become more cautious with potential safety hazards (Profit et al., 2014). Training on clinical practice guidelines, favorable working conditions, and continuous and supportive feedback on nurses promises an improvement in safety culture (Garcia et al., 2019). Along with organized workflows and without a significant physical and psychological overload of responsibilities, adverse events can be prevented to a greater extent.

Critical in the understanding of burnout among clinicians is the determination of the effectiveness of interventions addressed for them to ensure that depression, compromised patient safety, and barriers to professional well-being are carefully dealt with (Melnyk, 2020). Connecting with patients through transpersonal caring relationships, creates fulfillment, a key strategy that nurses can adopt in line with ensuring that the essence of the profession is prioritized amidst the numerous administrative tasks of the job (Caramanzana, 2020). Connecting with colleagues also influences compassion fatigue and satisfaction as it reduces the personal impact of

burnout secondary to the support of individuals who may share the same adversity (Balinbin et al., 2020). Advocating workplace changes in promoting healthy working environments and promoting research in the exploration of practical strategies to address burnout are vital implications for resilience (Kleinpell et al., 2020).

5. Conclusion

Burnout has highlighted its significance in the development of safety issues governing healthcare providers who oversee the care of their assigned patients. Consistent with physical and mental exhaustion as associated with burnout, this study reinforced the idea that nurses' ability to provide standard-based measures in upholding safety as a priority can be compromised at a considerable level. Recognizing the role of nurses' well-being in healthcare, policymakers should not only emphasize the need for evidence-based, quality, and safe interventions but also investigate the nurses' work conditions and contributory factors for burnout.

6. Limitations

Aside from the self-report questionnaire utilized in the study, the analytical technique included observer ratings to enable additional exploration of how observer ratings relate to assessments, which was not done in the study. Despite acknowledged limitations, this study offers light on the relevance of nurses' well-being in healthcare, and policymakers should not only stress the importance of evidence-based, high-quality, and safe interventions but also evaluate nurses' working circumstances and burnout risk factors.

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Compliance with ethical standards

Ethical consideration

The protocol of this study was submitted and reviewed by the Institutional Review Board of the University of Hafr Al Batin, Al-Batin with approval no. 14 dated 24th February 2020 under committee registration KACST No. H-05-FT-083. Likewise, the respondents were informed of the study purpose and its nature before informed consent is obtained with their right to anonymity, confidentiality, and refusal, and without being penalized once decided to withdraw at any time in the study. No animal or human studies were carried out by the authors.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Balinbin CBV, Balatbat KTR, Balayan ANB, Balcueva MIC, Balicat MGB, Balidoy TAS, and Torres GCS (2020). Occupational determinants of compassion satisfaction and compassion fatigue among Filipino registered nurses. Journal of Clinical Nursing, 29(5-6): 955-963. https://doi.org/10.1111/jocn.15163 **PMid:31887244**

Caramanzana H (2020). Millennial nurses connecting with patients. Nurse Leader, 18(1): 25-29. https://doi.org/10.1016/j.mnl.2019.09.019

Carneiro AS, Andolhe R, de Lima Dalmolin G, de Magalhães AMM, de Souza Magnago TSB, and Arrial TS (2021). Occupational stress, burnout and patient safety culture among workers from critical care and non-critical care units in a hospital in Brazil. Intensive and Critical Care Nursing, 63: 102978. https://doi.org/10.1016/j.iccn.2020.102978 **PMid:33257217**

Carta MG, Preti A, Portoghese I, Pisanu E, Moro D, Pintus M, and Grassi L (2017). Risk for depression, burnout and low quality of life among personnel of a university hospital in Italy is a consequence of the impact one economic crisis in the welfare system? Clinical Practice and Epidemiology in Mental Health, 13: 156-167. https://doi.org/10.2174/1745017901713010156 **PMid:29238392 PMCid:PMC5712646**

Dall'Ora C, Ball J, Reinius M, and Griffiths P (2020). Burnout in nursing: A theoretical review. Human Resources for Health, 18(1): 1-17. https://doi.org/10.1186/s12960-020-00469-9 **PMid:32503559 PMCid:PMC7273381**

Demerouti E, Bakker AB, Vardakou I, and Kantas A (2003). The convergent validity of two burnout instruments: A multitrait-multimethod analysis. European Journal of Psychological Assessment, 19(1): 12-23. https://doi.org/10.1027//1015-5759.19.1.12

Diehl E, Rieger S, Letzel S, Schablon A, Nienhaus A, Escobar Pinzon LC, and Dietz P (2021). The relationship between workload and burnout among nurses: The buffering role of personal, social and organizational resources. PLOS ONE, 16(1): e0245798. https://doi.org/10.1371/journal.pone.0245798 **PMid:33481918 PMCid:PMC7822247**

Dutton S and Kozachik SL (2020). Evaluating the outcomes of a web-based stress management program for nurses and nursing assistants. Worldviews on Evidence-Based Nursing, 17(1): 32-38. https://doi.org/10.1111/wvn.12417 **PMid:31912984**

Elbarazi I, Loney T, Yousef S, and Elias A (2017). Prevalence of and factors associated with burnout among health care professionals in Arab countries: A systematic review. BMC Health Services Research, 17(1): 1-10. https://doi.org/10.1186/s12913-017-2319-8 **PMid:28716142 PMCid:PMC5513024**

Feliciano A, Feliciano E, Feliciano JR, Fernandez Z, Devkota S, and Boshra A (2020). Philippine professional core competencies' impact on nurses' key performance indicators (KPIs) for patient safety outcomes. International Journal of Advanced and Applied Sciences, 7(1): 1-5. https://doi.org/10.21833/ijaas.2020.01.001

Fotovatfard A and Heravi G (2021). Identifying key performance indicators for healthcare facilities maintenance. Journal of Building Engineering, 42: 102838. https://doi.org/10.1016/j.jobe.2021.102838

Galletta M, Portoghese I, Ciuffi M, Sancassiani F, D'Aloja E, and Campagna M (2016). Working and environmental factors on job burnout: A cross-sectional study among nurses. Clinical Practice and Epidemiology in Mental Health, 12: 132-141. https://doi.org/10.2174/1745017901612010132 **PMid:27990173 PMCid:PMC5120375**

Garcia CDL, Abreu LCD, Ramos JLS, Castro CFDD, Smiderle FRN, Santos JAD, and Bezerra IMP (2019). Influence of burnout on patient safety: Systematic review and meta-analysis. Medicina, 55(9): 553. https://doi.org/10.3390/medicina55090553 **PMid:31480365 PMCid:PMC6780563**

Harizanova S, Stoyanova R, and Mateva N (2018). Do personality characteristics constitute the profile of burnout-prone correctional officers? Open Access Macedonian Journal of Medical Sciences, 6(10): 1912-1917. https://doi.org/10.3889/oamjms.2018.328 **PMid:30455773 PMCid:PMC6236039**

Hu SH, Wang T, Ramalho NC, Zhou D, Hu X, and Zhao H (2021). Relationship between patient safety culture and safety performance in nursing: The role of safety behavior. International Journal of Nursing Practice, 27(4): e12937. https://doi.org/10.1111/ijn.12937

Jun J, Ojemeni MM, Kalamani R, Tong J, and Crecelius ML (2021). Relationship between nurse burnout, patient and organizational outcomes: Systematic review. International Journal of Nursing Studies, 119: 103933. https://doi.org/10.1016/j.ijnurstu.2021.103933 **PMid:33901940**

Kleinpell R, Moss M, Good VS, Gozal D, and Sessler CN (2020). The critical nature of addressing burnout prevention: Results from the critical care societies collaborative's national summit on prevention and management of burnout in the ICU. Critical Care Medicine, 48(2): 249-253. https://doi.org/10.1097/CCM.0000000000003964 **PMid:31939795 PMCid:PMC6980420**

Melnyk BM (2020). Burnout, depression and suicide in nurses/clinicians and learners: An urgent call for action to enhance professional well-being and healthcare safety. Worldviews on Evidence-based Nursing, 17(1): 2-5. https://doi.org/10.1111/wvn.12416 **PMid:32017437**

Montgomery AP, Patrician PA, and Azuero A (2022). Nurse burnout syndrome and work environment impact patient safety grade. Journal of Nursing Care Quality, 37(1): 87-93. https://doi.org/10.1097/NCQ.0000000000000574 **PMid:34149033**

Polit DF, and Beck CT (2008). Nursing research: Generating and assessing evidence for nursing practice. Lippincott Williams and Wilkins, Philadelphia, USA.

Profit J, Sharek PJ, Amspoker AB, Kowalkowski MA, Nisbet CC, Thomas EJ, and Sexton JB (2014). Burnout in the NICU setting and its relation to safety culture. BMJ Quality and Safety, 23(10): 806-813. https://doi.org/10.1136/bmjqs-2014-002831 **PMid:24742780 PMCid:PMC4167972**

Rezaei S, Karami Matin B, Hajizadeh M, Soroush A, and Nouri B (2018). Prevalence of burnout among nurses in Iran: A systematic review and meta-analysis. International Nursing Review, 65(3): 361-369. https://doi.org/10.1111/inr.12426 **PMid:29380381**

Uttley J (2019). Power analysis, sample size, and assessment of statistical assumptions-Improving the evidential value of lighting research. Leukos, 15(2-3), 143-162. https://doi.org/10.1080/15502724.2018.1533851

Woo T, Ho R, Tang A, and Tam W (2020). Global prevalence of burnout symptoms among nurses: A systematic review and meta-analysis. Journal of Psychiatric Research, 123: 9-20. https://doi.org/10.1016/j.jpsychires.2019.12.015 **PMid:32007680**

Zarei E, Khakzad N, Reniers G, and Akbari R (2016). On the relationship between safety climate and occupational burnout in healthcare organizations. Safety Science, 89: 1-10. https://doi.org/10.1016/j.ssci.2016.05.011