

THE CORRELATION AVAILABILITY NURSES AND EQUIPMENT WITH ACUTE MISSED NURSING CARE AT HOSPITALS

Hubungan Ketersediaan Perawat dan Peralatan Terhadap Acute Missed Nursing Care pada Rumah Sakit

Kuswantoro Rusca Putra¹, Fajar Mulia Dewi², Asih Devi Rahmayanti², Ani Budiati²

¹Management and Nursing Leadership Department, School of Nursing, Brawijaya University, Malang, Indonesia

²Management and Nursing Leadership Department, Master Student of Nursing, Brawijaya University, Malang, Indonesia

Correspondence*:

Address: Brawijaya University, Jl. Veteran, Malang, Indonesia | e-mail: mfajardewi@gmail.com

Abstract

Background: One of the nurse's roles is to provide nursing care regards of patient safety, consistently and timely. The availability of nurses and equipment can be considered as a primary constraint contributing to acute missed nursing care.

Aims: This study aimed to determine the correlation between the availability of nurses and equipment with incidences of acute missed nursing care in medical and surgical wards at hospitals.

Methods: This study used quantitative research with a cross sectional approach. This research was conducted at six private hospitals in Malang from October 2020 to November 2020. The population in this study were selected using consecutive sampling, and the study sample consisted of 206 nurses. The acute MISSCARE Survey was used to collect data. The relationship between the availability of the number of nurses and equipment with acute missed nursing care was analyzed by applying SPSS version 26 with the Spearman test.

Results: The relationship between the availability of nurses and acute missed nursing care yielded results of $p = 0.016$ (<0.05) and $R = -0.168$. Equipment availability and acute missed nursing care had values of $p = 0.026$ (<0.05), and $R = -0.155$. This shows correlation between the availability of the number of nurses and equipment with incidences of acute missed nursing care.

Conclusion: The availability of the number of nurses and equipment are the reasons for the incidence of acute missed nursing care. Therefore, nursing managers are needed in managing and allocating the necessary number of nurses and equipment.

Keywords: equipment, missed nursing care, nurse

Abstrak

Latar Belakang: Salah satu peran perawat memberikan asuhan keperawatan kepada pasien dengan aman tanpa ada yang terlewatkan atau tertunda. Ketersediaan jumlah perawat dan penyediaan alat - sarana perawatan menjadi alasan terbesar terjadinya asuhan keperawatan terlewatkan atau tertunda, hal ini dapat mengurangi kualitas asuhan keperawatan yang diterima pasien.

Tujuan: Penelitian ini untuk mengetahui hubungan ketersediaan jumlah perawat dan peralatan dengan kejadian acute missed nursing care pada pasien ruang medikal bedah.

Metode: Penelitian kuantitatif menggunakan pendekatan cross sectional. Penelitian ini dilaksanakan pada enam rumah sakit swasta di Malang pada Oktober 2020 sampai November 2020. Populasi dalam penelitian ini adalah seluruh perawat ruang medikal bedah pada rumah sakit swasta di Malang dengan menggunakan consecutive sampling, sampel penelitian 206 perawat, terdiri dari 4 rumah sakit tipe B: 174 perawat, dan 2 rumah sakit tipe C: 32 perawat. Penelitian ini menggunakan alat survei MISSCARE. Analisa hubungan antar variabel ketersediaan jumlah perawat dan ketersediaan alat dengan acute missed nursing care menerapkan aplikasi SPSS versi 26.

Hasil: Hubungan ketersediaan jumlah perawat dengan acute missed nursing care $p = 0.016$ (<0.05), dan $R = -0.168$. Hubungan ketersediaan alat dengan acute missed nursing care $p = 0.026$ (<0.05), dan $R = -0.155$. Hal ini menunjukkan adanya hubungan antara ketersediaan jumlah perawat dan ketersediaan alat dengan kejadian acute missed nursing care.

Kesimpulan: Ketersediaan jumlah perawat dan ketersediaan peralatan menjadi penyebab timbulnya acute missed nursing care. Oleh karena itu, manajer perawat sangat penting dalam mengelola jumlah perawat yang tepat dan ketersediaan peralatan.

Kata kunci: missed nursing care, perawat, peralatan



Jurnal Administrasi Kesehatan Indonesia

p-ISSN 2303-3592, e-ISSN 2540-9301

Volume 9 No.2 2021 DOI: 10.20473/jaki.v9i2.2021.150-160

Received: (2021-03-18) Revised: (2021-06-28) Accepted: (2021-07-07) Published: (2021-11-28)

Published by Universitas Airlangga in collaboration with Perhimpunan Sarjana dan Profesional Kesehatan Masyarakat Indonesia (Persakmi).

This is an Open Access (OA) article distributed under the terms of the Creative Commons Attribution Share-Alike 4.0 International License (<https://creativecommons.org/licenses/by-sa/4.0/>).

Introduction

One of roles is to provide nursing care to patients without missing or delaying care (Nilasari, Hariyati, and Anisah, 2020). Missed nursing care is a form of negligence towards patients (Duffy, Culp, and Padrutt, 2018). Previous study stated that missed nursing care occurs in individual interventions such as indications of patient mobilization needs, drug administration, and oral care (Winsett *et al.*, 2016). Missed or delayed nursing care occurs in the nursing care process (assessment, diagnosis, planning, implementation, and evaluation) because of the patient care environment (level of patient care needs, allocation of labor resources, allocation of material resources, and relationships or communication) and the nurses themselves (team rules, decision-making priorities, internal values and beliefs, and habits) (Albsoul *et al.*, 2019; Dabney, Kalisch, and Clark, 2019; Hessels *et al.*, 2019).

A study at 168 hospitals in the USA by Van Fosson, Jones, and Yoder (2016) reported that missed nursing care in nursing interventions they occurred during these stage as follows: individual needs interventions, basic needs interventions, and planning. Missed nursing care has occurred in several countries, with as many as 86% of nurses in Britain and 74% of nurses in Sweden having missed nursing care at the end of their shift (Ball *et al.*, 2018). Missed nursing care occurs during activities such as patient mobilization or ambulation, taking care of personal hygiene, and patient education. When this happens, emotional support for patients is eliminated or postponed in various care units (Vryonides *et al.*, 2018). Meanwhile, there is no research on the incidence of acute missed nursing care in Indonesia.

The most frequently missed or delayed treatments in the medical surgery room occur during ambulation of patients, medication administered within 30 minutes, and oral care (Jones, Hamilton, and Murry, 2015). Missed care occurs due to increased patient volume, the number of patients being admitted and discharged, inadequate assistants, inadequate staff, unavailable

medicine, administrative tasks, and patient care (dos Reis Dutra, Salles and Guirardello, 2019). Another study stated the nursing actions most often neglected in the medical room were entertaining or talking to patients (66%), educating patients (52%), and developing or updating nursing care plans (47%) (Duffy, Culp and Padrutt, 2018). Meanwhile, data in Indonesia shows that as many as 80% of nurses underperformed in several nursing interventions (Asmirajanti, Hamid and Hariyati, 2019). Meanwhile, in the medical surgery room, there is no research on the incidence of acute missed nursing care.

Missed nursing care is a phenomenon that can threaten patient safety and have a direct impact on the quality of patient care (Srulovici and Drach-Zahavy, 2017a; Kim, Yoo and Seo, 2018; Rabin *et al.*, 2019; Cho *et al.*, 2020). Missed nursing care also has consequences for nurses, such as decreased personal accountability of nurses, job satisfaction, and intention to resign or turn over (Srulovici and Drach-Zahavy, 2017b).

Missed nursing care that the patient needs are not implemented or delayed occurs in the nursing care process, and is determined by allocation of labor resources and allocation of material resources (Hessels *et al.*, 2019). Several studies have stated that the variables of nurse availability and of medical tool availability were important factors in the occurrence of missed nursing care (Ball *et al.*, 2016; Dabney, Kalisch, and Clark, 2019). Nursing staff composition and missed nursing care were significantly associated with an increase in nurse workload by one patient. A 10% increase in missed nursing care was associated with 7% and 16% increases in the likelihood of a patient dying within 30 days of admission to care (Ball *et al.*, 2018).

Provision of equipment and means of care can be considered the greatest factors impacting the quality of healthcare, as it is impossible to provide high-quality care if equipment is not provided safety (Rabin *et al.*, 2019). Nurses are essential to providing safe and effective care, but the insufficient number of nurses lead to heavy workloads, which can subsequently lead to missed nursing care (Gathara *et al.*, 2020).

Research has shown that insufficient hospital staff resources or a lower number of nurses leads to heavy workloads during shift periods (Junttila *et al.*, 2016; Jansson, Syrjälä and Ala-Kokko, 2019).

According to several studies, the incidence of missed nursing care in the medical and surgical wards to the availability of personnel and equipment, and this has a negative impact on patients and nurses. Research has not investigated acute missed nursing care in the medical and surgical wards in Indonesia. This study aimed to determine the relationship between the availability of nurses and equipment with acute missed nursing care in medical and surgical wards at private hospitals in Malang.

Method

This quantitative research used an observational-descriptive design with a cross sectional approach. The population in this study was all nurses in the surgical and medical wards at private hospitals in Malang. This study used consecutive sampling with a sample of 206 registered nurses. It was conducted at six private hospitals supported by having a medical surgery room. All the hospitals were located in Malang and investigated from October 2020 to November 2020 consisting of four type B hospitals with 174 nurses, and two type C hospitals with 32 nurses.

The study used the acute MISSCARE Survey tool containing 15 question items; namely focused review, assessment, monitoring blood sugar, documentation, monitoring vital sign, managing treatment effectiveness, skin and wound care, emotional support, monitoring of incoming and outgoing fluids, administering drugs if necessary, hand washing, intravenous access care, patient education, toileting, and schedule of drug administration. Respondents were asked to report how often certain elements of nursing care were missed using a Likert scale: A = Always Missed (1), OM = Often Missed (2), SM = Sometimes Missed (3), RM = Rarely Missed (4), and NM = Never Missed (5) (Dabney, Kalisch, and Clark, 2019). The reason MISSCARE survey tool containing 8 question item namely focused review on

the availability of nurses: nurse assistants are not on duty or absent; drugs are not available when needed; the number of nurses is inadequate; the emergency condition of other patients; an unexpected increase in patients; insufficient or absent number of nursing assistants; the number of other tasks outside of nursing performed by nurses; and the number of administrative tasks; and 2 question items: focused review on the availability and functions of equipment to support nursing care. Respondents were asked to indicate the reasons for missing elements of nursing care using a Likert scale: 1 = not a causative factor, 2 = a causative factor, but at a minimum, 3 = a partial causal factor, and 4 = the main causative factor (Bragadóttir, Kalisch, and Tryggvadóttir, 2017; dos Reis Dutra, Salles and, Guirardello, 2019). The research instrument has tested the validity and reliability of the 10 respondents with the results r count = 0.68 and α = 0.6.

Respondents used an online form link to fill out the research survey, which was forwarded by the nursing managers of each hospital over a two-week period. The relationship between the availability of nurses and tools with acute missed nursing care was analyzed using the SPSS application version 26 for Windows 14. The differences in the incidences of acute missed nursing care and the demographic characteristics between the two types of hospitals were analyzed using the Wilcoxon test. The relationship between the availability of nurses and tools with acute missed nursing care was analyzed using the Spearman test. All statistical analyses were performed at the 0.05 significance level.

This study has obtained ethical eligibility from the Health Research Ethics Committee of the Faculty of Medicine, Brawijaya University Number 183/EC/KEPK/10/2020 and a research permit from six private hospitals in Malang. In accordance with the research ethics protocol, the ethical principles included informed consent, beneficence, respect for anonymity, confidentiality, and respect.

Result and Discussion

The nursing process is also beneficial for patients because they participate in determining nursing planning and build cooperation in implementing nursing actions. The nursing process prevents the occurrence of duplicated actions and insufficient action, and improves high quality nursing care (Budiono, 2016; Pérez *et al.*, 2017). Proper nursing care impacts both nurses and patients, and prevents duplicated actions and missed care.

The relationship between the availability of nurses and equipment with acute missed nursing care was analyzed using the Spearman test, as shown in Table 1. There was a relationship between the availability of nurses and acute missed nursing care with a negative strength (ρ value = 0.016 (<0.05); (R) -0.168 (± 0 to ± 1)). Availability of equipment with acute missed nursing care had with a negative strength (ρ value = 0.026 (<0.05); (R) -0.155 (± 0 to ± 1)), which indicates that there is a negative relationship between tool availability and incidences of acute missed nursing care. This shows a relationship between the availability of nurses and equipment with incidences of acute missed nursing care.

Inadequate staff resources or a lower number of nurses lead to heavy workloads during shifts (Junttila *et al.*, 2016; Jansson, Syrjälä and Ala-Kokko, 2019). The results in Table 1 showed that there was a relationship between the availability of nurses and incidences of acute missed nursing care. The increasing unavailability of nurses is the main factor causing patient care to be missed or delayed, and it increases the incidences of acute missed

nursing care. The insufficient number of nurse personnel can hinder nursing practice, and this is consistent with the results of the study that states factors in the care environment (e.g., workload due to lack of personnel) can facilitate or hinder nursing practice (Rabin *et al.*, 2019). Research on hospitals in France and Finland showed that insufficient staff resources or a lower number of nurses led to heavy workloads during shift periods (Junttila *et al.*, 2016; Jansson, Syrjälä and Ala-Kokko, 2019). Therefore, nursing managers need to plan for personnel requirements and handle workload problems related to nursing work in order to increase nurse productivity and satisfaction, as well as reduce turnover, work stress, and provide adequate staff for patient care needs (Alghamdi, 2016; Qureshi *et al.*, 2019; Bagnasco *et al.*, 2020).

Management of nursing workload and staffing is needed, especially in creating and maintaining a healthy work environment, setting practices that maximize the health and well-being of nurses, and ensuring quality patient care (Hovenga and Lowe, 2020). The components of the nursing workload identified in terms of patients, nurses, and health institutions have been divided into five main categories: total nursing time, nursing competency level, weight of patient care required, the amount of physical exertion, and complexity of treatment (Alghamdi, 2016). Effective staffing requires comprehensive nursing workload measurements to determine staffing needs,

Table 1. Analysis of the Relationship between Availability of the Number of Nurses and Availability of Equipment with Acute Missed Nursing Care in the medical and surgical wards (n = 206).

Variables	Correlation coefficients (R)	p-values
Number of available nurses	-0.168	0.016
Availability of equipment	-0.155	0.026

Spearman test

handle increased workload volume, and manage the impact on nursing services at any given time (Swiger, Vance and Patrician, 2016). The high workload of nurses increases the occurrence of missed nursing care, which results in patients having a longer length of stay (Tubbs-Cooley *et al.*, 2019). When nurses' resources are insufficient (e.g., insufficient practice environment and time), nurses may minimize their standard of care or share of attention across nursing activities or even across patients. This can increase the risk of adverse outcomes for patients, thereby threatening patient safety and reducing the quality of care. Nursing care priorities can be described in terms of implicit offering, in which nurses decide to withhold or not carry out the necessary nursing duties when they are deprived of nursing resources through clinical decision making and judgment.

Inadequate material resources, such as facilities and infrastructure, cause nurses to skip or delay patient nursing care (Haftu *et al.*, 2019; Tou *et al.*, 2020). The results of the study showed a relationship between the availability of equipment and incidences of acute missed nursing care, as shown in Table 1. The unavailability of tools is the main factor causing patient care to be missed or delayed, and it increases incidences of acute missed nursing care. The availability of physical tools and functions when needed can facilitate or can become a barrier to nursing services (Henderson *et al.*, 2016; Rabin *et al.*, 2019). Therefore, it is necessary to fulfil the need for tools optimally in terms of their existence and function by the hospital as a health service provider, in order to prevent the occurrence of acute missed nursing care (Ogboenyi *et al.*, 2020; Dutra and Guirardello, 2021).

The relationship between the availability of nurses and tools with incidences of acute missed nursing care is negative. This means that if nurses perceive that the availability of nurses and tools is the main factor causing patient care to be abandoned, incidences of acute

missed nursing care increase. Health services are an integral part of hospitals or health clinics. Maximum service can be achieved if the availability of resources in the service center is adequate. However, the availability of adequate resources cannot be ascertained, and excessive availability of resources can also result in waste. The problem that often occurs is the lack of optimal services provided to patients due to limited available resources. Optimal barriers to service include the repetition of unpermitted services, uncertain service distances, and service time (Pardede *et al.*, 2019). The hospital must procure the equipment needed to develop and support the health system (Nkwanyana and Voce, 2019).

The work environment of nurses is associated with quality of care, mortality during patient care, and missed nursing care. The missed nursing care model shows that missed nursing care can occur at any stage of the nursing process. The model also describes the internal processes and factors that guide nurses in deciding what elements of care should be given priority, and thus resolved or overlooked (eliminated or delayed) until resources are enough available. Missed nursing care can occur due to human resources and material resources (infrastructure) factors. Missed nursing care can be caused by the factor of human resources, specifically when the number of staff members is inadequate. More staff members increase sufficiency and level of teamwork, and it reduces incidents of missed nursing care. Material resources contribute to missed nursing care when supplies or equipment do not function properly when needed, supplies or equipment are unavailable when needed, and medicine is unavailable when needed. Unbalanced patient assignment also affects missed nursing care, especially when other departments do not provide the needed care (e.g., physical therapy is not running, inadequate handover from previous shift or sending unit, lack of support from team members).

Missed nursing care is the negligence of nursing care that is needed by patients (Pérez *et al.*, 2017). Missed care occurs when a nurse is asked to perform various activities at the same time, but some activities are not carried out or are delayed (Cho *et al.*, 2020). Assessment of nurses, which includes missed nursing care related to the primary assessment of nurses, which can be in the form of incomplete care, or care that is deliberately not given (Srulovici and Drach-Zahavy, 2017b).

Missed or delayed nursing care causes morbidity and mortality of patients in the surgical ward (Ball *et al.*, 2018). Missed nursing care is a phenomenon that can threaten patient safety and have a direct impact on the quality of patient care (Srulovici and Drach-Zahavy, 2017a; Kim, Yoo, and Seo, 2018; Rabin *et al.*, 2019). This can lead to negligence and commission errors in nursing actions, which is failure to take action correctly. The MISSCARE survey instrument identifies these action as lost or overlooked. The negligence of agreement forms in therapeutic transactions by health personnel can result in overlooked and unfulfilled content on the forms. This has a broad impact not only on patients and families, but also on hospitals, individual nurse perpetrators, and on the profession in the form of criminal or civil lawsuits.

The elements of nursing care in missed care have been classified into four groups: nursing assessments, basic care interventions, individual needs interventions, and planning. The planning category includes nursing assessment procedures, and the assessment procedures most frequently missed by nurses in medical and surgical wards are complete documentation of all data needed, monitoring fluid intake and output, and assessing vital signs in order. The nursing procedures most often missed in the basic care-intervention category are ambulation, changing the patient's position every two hours, and oral care. The interventions associated with individual needs that are most often missed by nurses

are emotional support for the patient and family, treatment effectiveness assessment, medication given within 30 minutes before or after the scheduled time, and PRN treatment requests followed up within 5 minutes. The most frequently overlooked items of nursing care related to planning are attendance at interdisciplinary care conferences, and patient education about diseases, tests, and diagnostic procedures (Albsoul, 2019).

Missed nursing care is influenced by internal and external factors (Albsoul *et al.*, 2019; Hessels *et al.*, 2019). Internal factors come from the individual nurses themselves and their perceptions and internal values. External factors come from the work environment, teamwork, communication, organizational learning, workload, management support for patient safety, and available infrastructure (Bragadóttir, Kalisch, and Tryggvadóttir, 2017; Cho *et al.*, 2020). The main reasons for missed nursing care in the medical surgery room are the insufficient number of nurses, the emergency condition of the patient during work shifts, and the unavailability of drugs, materials, or equipment when needed (dos Reis Dutra, Salles, and Guirardello, 2019). Low work environment accountability leads to acute missed nursing care. Factors in the care environment can facilitate or hinder nursing practices.

Table 2 shows that the nurses in the medical and surgical wards consisted of 206 nurses from 6 private hospitals in Malang. The demographic data shows 31 male nurses (15%) and 175 female nurses (85%). As many as 144 nurses (70%) were aged 30 and under, while 62 nurses (30%) were above the age of 30. Besides, 151 nurses (73%) had D3 degrees, while 55 nurses (27%) had S1 degrees in nursing. Regarding their work, 128 nurses (62%) were permanent employees, and the remaining 38 were contract nurses (40%). Furthermore, 191 nurses (93%) worked on shift schedules, while 15 nurses (7%) worked on non-shift schedules. Lastly, 117 nurses (57%) had worked for five years or

less, and 89 nurses (43%) had worked for over five years. In terms of marital status, 139 nurses (67%) were married, and 67 nurses (33%) were unmarried.

Table 2 shows the demographic characteristics data obtained from the respondents. There was a difference of p value = 0.016 (≤ 0.05) in incidences of acute missed nursing care between permanent and contract employees. Incidences of acute missed nursing care was higher among permanent employees (mean = 41.19) than contract employees (mean = 35.38). Hospital unit characteristics and nurse characteristics may be indicators of the acute missed nursing care phenomenon. Staffing competence is a key mechanism that affects the quality of patient care.

There is a difference that can be seen in the occurrence of acute missed nursing care from the demographic data of employment status. The incidences of

acute missed nursing care based on permanent employment status is greater than that of contract employees, as shown in Table 2. This is in accordance with the results of research that associated missed care with several factors from the perception of nurses based on demographic data, namely the number of nurses' children, years of experience working as a nurse, the assignment unit, and the level of satisfaction with the profession (Bragadóttir, Kalisch and Tryggvadóttir, 2017; Alshammari *et al.*, 2020). Therefore, nurse managers must plan actions to reduce the nursing workload through teamwork, as well as improve patient safety culture and job satisfaction by developing solutions for nurses to feel empowered (Metcalf, Wang, and Habermann, 2018; Bacaksiz *et al.*, 2020; Dutra and Guirardello, 2021).

Table 2. Demographic Characteristics of Respondents to the Incidences of Acute Missed Nursing Care in the medical and surgical wards (n = 206).

Respondent characteristics	Frequency	Percentages	p-values
Gender			0.450 (>0,05)
Male	31 nurses	15%	
Female	175 nurses	85%	
Age			0.400 (>0,05)
≤ 30 years	144 nurses	70%	
>30 years	62 nurses	30%	
Educational stage			0.723 (>0,05)
Diploma 3 of Nursing	151 nurses	73%	
Bachelors of Nursing	55 nurses	27%	
Employment status			0.016 ($\leq 0,05$)
Permanent employees	128 nurses	62%	
Contract employees	38 nurses	40%	
Work schedule			0.232 (>0,05)
Shift	191 nurses	93%	
Non-shift	15 nurses	7%	
Length of working			0.296 (>0,05)
≤5 years	117 nurses	57%	
>5 years	89 nurses	43%	
Marital status			0.312 (>0,05)
Married	139 nurses	67%	
Single	67 nurses	33%	
Hospital type			0.259 (>0,05)
Type C hospital	32 nurses	16%	
Type B hospital	174 nurses	84%	

Wilcoxon test

Nurses' decisions to eliminate or delay certain care activities are also influenced by nurses' intrinsic perceptions of the process in terms of team norms, decision-making practices and embedded values, beliefs, habits, and attitudes through which nurses perceive their roles and responsibilities. Low personal accountability leads to the occurrence of missed nursing care (Srulovici and Drach-Zahavy, 2017b). When the level of competency of nursing staff is low, the potential for acute missed nursing care increases due to a lack of time in patient management experience. The foundations of nursing ethics are to save human lives, to protect patients from harm, to respect human rights, and to create patient safety, high quality service, and dignified, caring, and comprehensive care for patients without discrimination (Vryonides *et al.*, 2018). Patient safety culture is a vital health component in the quality of care, characterized by a healthcare provider's perspective on the importance of safety, and a belief in the effectiveness of patient care outcomes and remedial actions.

Conclusion

Missed nursing care occurs when nursing care is postponed, partially completed, or not completed at all. The occurrence of missed nursing care is determined by human resources and material resources (equipment availability). This study shows that there is a relationship between the availability of nurses and tools with incidences of acute missed nursing care in the medical and surgical wards. Heavier workload and unavailability of tools are considered by nurses as the main causes of patient nursing care being missed, and these factors increase incidences of acute missed nursing care.

Proper nursing care will impact both the nurse and the patient, for example preventing duplicated actions and missed care. Provision of care can be considered an indicator of the quality of health services. It is impossible to provide high quality care if both manpower and equipment are not available enough. Therefore, it is the duty of every health institution to reduce the

likelihood of injury to patients by providing adequate care. Nursing quality is an important factor in ensuring patient safety because nursing care that is below standard directly leads to the occurrence of missed nursing care during treatment. This shows the need for human resource management interventions in the form of nursing managers allocating appropriate workloads to reduce the occurrence of acute missed nursing care. The availability of tools determines the quality of patient care, therefore the availability of physical and functional tools is also expected to reduce the occurrence of missed nursing care.

Abbreviations

Not applicable.

Declarations

Ethics Approval and Consent Participant

This study has obtained ethical eligibility from the Health Research Ethics Committee of the Faculty of Medicine, Brawijaya University.

Conflict of Interest

The authors states that there is no conflict of interest in this article.

Availability of Data and Materials

Data and material research can be provided by upon request.

Authors' Contribution

KRP, AB and FMD conceptualized the study; ADR created the methodology; FMD, AB, and ADR wrote, reviewed, and edited the manuscript; KRP and FMD wrote the original draft.

Acknowledgment

We would like to thank the Management and Nursing Leadership Department, Universitas Brawijaya and Nursing Manager at the Private Hospitals, for their technical support and all the contributors to this study.

References

- Albsoul, R. *et al.* (2019) 'Factors influencing missed nursing care in public hospitals in Australia: An exploratory

- mixed methods study', *International Journal of Health Planning and Management*. doi: 10.1002/hpm.2898.
- Albsoul, R. A. M. (2019) 'Investigating Missed Nursing Care In An Australian Acute Care Hospital: An Exploratory Study', p. 318.
- Alghamdi, M. G. (2016) 'Nursing workload: A concept analysis', *Journal of Nursing Management*. doi: 10.1111/jonm.12354.
- Alshammari, M. H. *et al.* (2020) 'Nurses' Perspectives On The Degree Of Missed Nursing Care In The Public Hospitals In Hail City, Kingdom Of Saudi Arabia', *Belitung Nursing Journal*. doi: 10.33546/bnj.1233.
- Asmirajanti, M., Hamid, A. Y. S. and Hariyati, R. T. S. (2019) 'Nursing care activities based on documentation', *BMC Nursing*. doi: 10.1186/s12912-019-0352-0.
- Bagnasco, A. *et al.* (2020) 'Are data on missed nursing care useful for nursing leaders? The RN4CAST@IT cross-sectional study', in *Journal of Nursing Management*. doi: 10.1111/jonm.13139.
- Ball, J. E. *et al.* (2016) 'A cross-sectional study of "care left undone" on nursing shifts in hospitals', *Journal of Advanced Nursing*. doi: 10.1111/jan.12976.
- Ball, Jane E. *et al.* (2018) 'Post-operative mortality, missed care and nurse staffing in nine countries: A cross-sectional study', *International Journal of Nursing Studies*. doi: 10.1016/j.ijnurstu.2017.08.004.
- Ball, Jane E *et al.* (2018) 'Post-operative mortality , missed care and nurse staffing in nine countries : A cross-sectional study', 78(August 2017), pp. 10–15. doi: 10.1016/j.ijnurstu.2017.08.004.
- Bragadóttir, H., Kalisch, B. J. and Tryggvadóttir, G. B. (2017) 'Correlates and predictors of missed nursing care in hospitals', *Journal of Clinical Nursing*. doi: 10.1111/jocn.13449.
- Budiono (2016) 'Konsep Dasar Keperawatan Komprehensif', *Kementerian Kesehatan Republik Indonesia*.
- Cho, S. H. *et al.* (2020) 'Nurse staffing, nurses prioritization, missed care, quality of nursing care, and nurse outcomes', *International Journal of Nursing Practice*. doi: 10.1111/ijn.12803.
- Dabney, B. W., Kalisch, B. J. and Clark, M. (2019) 'A revised MISSCARE survey: Results from pilot testing', *Applied Nursing Research*. doi: 10.1016/j.apnr.2019.151202.
- Duffy, J. R., Culp, S. and Padrutt, T. (2018) 'Description and Factors Associated with Missed Nursing Care in an Acute Care Community Hospital', *Journal of Nursing Administration*. doi: 10.1097/NNA.0000000000000630.
- Dutra, C. K. dos R. and Guirardello, E. de B. (2021) 'Nurse work environment and its impact on reasons for missed care, safety climate, and job satisfaction: A cross-sectional study', *Journal of Advanced Nursing*. doi: 10.1111/jan.14764.
- Eskin Bacaksiz, F. *et al.* (2020) 'A cross-sectional study of the determinants of missed nursing care in the private sector: Hospital/unit/staff characteristics, professional quality of life and work alienation', in *Journal of Nursing Management*. doi: 10.1111/jonm.12999.
- Gathara, D. *et al.* (2020) 'Missed nursing care in newborn units: a cross-sectional direct observational study', *BMJ Quality and Safety*. doi: 10.1136/bmjqs-2019-009363.
- Haftu, M. *et al.* (2019) 'Commonly missed nursing cares in the obstetrics and gynecologic wards of Tigray general hospitals; Northern Ethiopia', *PLoS ONE*. doi: 10.1371/journal.pone.0225814.
- Henderson, J. *et al.* (2016) 'The impact of rationing of health resources on capacity of Australian public sector nurses to deliver nursing care after-hours: a qualitative study', *Nursing Inquiry*. doi: 10.1111/nin.12151.
- Hessels, A. J. *et al.* (2019) 'Impact of Patient Safety Culture on Missed Nursing Care and Adverse Patient Events', *Journal of Nursing Care*

- Quality*. doi: 10.1097/NCQ.0000000000000378.
- Hovenga, E. J. S. and Lowe, C. (2020) 'Measuring health service quality', in *Measuring Capacity to Care Using Nursing Data*. doi: 10.1016/b978-0-12-816977-3.00011-3.
- Jansson, M. M., Syrjälä, H. P. and Ala-Kokko, T. I. (2019) 'Association of nurse staffing and nursing workload with ventilator-associated pneumonia and mortality: a prospective, single-center cohort study', *Journal of Hospital Infection*. doi: 10.1016/j.jhin.2018.12.001.
- Junttila, J. K. *et al.* (2016) 'Hospital mortality and optimality of nursing workload: A study on the predictive validity of the RAFAELA Nursing Intensity and Staffing system', *International Journal of Nursing Studies*. doi: 10.1016/j.ijnurstu.2016.03.008.
- Kim, K. J., Yoo, M. S. and Seo, E. J. (2018) 'Exploring the Influence of Nursing Work Environment and Patient Safety Culture on Missed Nursing Care in Korea', *Asian Nursing Research*. doi: 10.1016/j.anr.2018.04.003.
- Metcalfe, A. Y., Wang, Y. and Habermann, M. (2018) 'Hospital unit understaffing and missed treatments: primary evidence', *Management Decision*. doi: 10.1108/MD-09-2017-0908.
- Nilasari, P., Hariyati, R. T. S. and Anisah, S. (2020) 'Penerapan SPO Pelaksanaan Asuhan Keperawatan di Ruang Sub Instalasi Rawat Inap X Rumah Sakit Militer Jakarta: Pilot Study', *Dunia Keperawatan: Jurnal Keperawatan dan Kesehatan*. doi: 10.20527/dk.v8i2.8026.
- Nkwanyana, N. M. and Voce, A. S. (2019) 'Are there decision support tools that might strengthen the health system for perinatal care in South African district hospitals? A review of the literature', *BMC Health Services Research*. doi: 10.1186/s12913-019-4583-2.
- Ogboenyi, A. A. *et al.* (2020) 'Missed Nursing Care in Pediatric and Neonatal Care Settings: An Integrative Review', *MCN. The American journal of maternal child nursing*. doi: 10.1097/NMC.0000000000000642.
- Pardede, A. M. H. *et al.* (2019) 'Optimization of health care services with limited resources', *International Journal on Advanced Science, Engineering and Information Technology*. doi: 10.18517/ijaseit.9.4.8348.
- Pérez, A. *et al.* (2017) 'konsep dasar keperawatan', *BMC Public Health*.
- Qureshi, S. M. *et al.* (2019) 'Predicting the effect of nurse-patient ratio on nurse workload and care quality using discrete event simulation', *Journal of Nursing Management*. doi: 10.1111/jonm.12757.
- Rabin, E. G. *et al.* (2019) 'Application of the MISSCARE scale in an Oncology Service: A contribution to patient safety', *Revista da Escola de Enfermagem*. doi: 10.1590/S1980-220X2018025403513.
- dos Reis Dutra, C. K., Salles, B. G. and Guirardello, E. de B. (2019) 'Situations and reasons for missed nursing care in medical and surgical clinic units', *Revista da Escola de Enfermagem*. doi: 10.1590/S1980-220X2017050203470e03470.
- Srulovici, E. and Drach-Zahavy, A. (2017a) 'Nurses' personal and ward accountability and missed nursing care: A cross-sectional study', *International Journal of Nursing Studies*. doi: 10.1016/j.ijnurstu.2017.08.003.
- Srulovici, E. and Drach-Zahavy, A. (2017b) 'Nurses' personal and ward accountability and missed nursing care: A cross-sectional study', *International Journal of Nursing Studies*. doi: 10.1016/j.ijnurstu.2017.08.003.
- Swiger, P. A., Vance, D. E. and Patrician, P. A. (2016) 'Nursing workload in the acute-care setting: A concept analysis of nursing workload', *Nursing Outlook*. doi: 10.1016/j.outlook.2016.01.003.
- Tou, Y. H. *et al.* (2020) 'Investigating missed care by nursing aides in Taiwanese long-term care facilities', in *Journal of Nursing Management*. doi: 10.1111/jonm.12873.

Tubbs-Cooley, H. L. *et al.* (2019) 'Association of Nurse Workload with Missed Nursing Care in the Neonatal Intensive Care Unit', *JAMA Pediatrics*. doi: 10.1001/jamapediatrics.2018.3619.

Vryonides, S. *et al.* (2018) 'Ethical climate and missed nursing care in cancer

care units', *Nursing Ethics*. doi: 10.1177/0969733016664979.

Winsett, R. P. *et al.* (2016) 'Medical surgical nurses describe missed nursing care tasks—Evaluating our work environment', *Applied Nursing Research*. doi: 10.1016/j.apnr.2016.06.006.