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Influence of Nursing Factors on the Quality of Nursing Diagnosis, Intervention and Outcome on Orthopedic Patients in Indonesia: Cross Sectional Study

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ABSTRACT

Background: Increasing the number of orthopedic disorders will also increase the number of treatments for orthopedic patients in hospitals. However, there are no studies that specifically identify the impact of nurses' factors on the quality of orthopedic care. **Objective:** To identify the impact of nurses' factors on the quality of nursing diagnosis, intervention, and outcome in orthopedic patients. **Methods:** A cross-sectional design with consecutive sampling techniques was conducted in this study. collecting data at the West Java Province Hospital in Indonesia from July to September 2022. Statistical analysis used the chi-square test; significance was $p < 0.05$. **Results:** A total of 236 nurses were recruited. 145 participants (61.4%) were female. 133 (56.4%) had a diploma level of education, and 143 participants (60.6%) had good competence. The knowledge of participants was both enough and less, with 99 (41.9%) and 98 (41.5%), respectively. 180 participants (76.3%) demonstrated good skills. The quality of the orthopedic nursing process for nursing diagnosis (97.4%), nursing intervention (96.1%), and nursing outcome (97.0%) were good. In addition, nursing variables impacted the quality of nursing outcomes in orthopedic patients in relation to age ($p<0.05$). **Conclusion:** The quality of the orthopedic nursing process for nursing diagnosis, nursing intervention, and nursing outcome was good. In addition, nursing parameters such as age had a substantial effect on the quality of nursing outcomes in orthopedic patients. **Recommendation:** This research suggests that the focus should be on nurse factors including education, knowledge, skills, and competence in order to achieve quality nursing and to carry out nursing diagnosis, nursing intervention, and nursing outcome.

Keywords: Nurses; Orthopedic; Patients; Quality Nursing Care

INTRODUCTION

Multiple fractures and limb amputations can arise from orthopedic problems (Vincent *et al.*, 2015). Fractures of the wrist, hand/finger, hip/upper thigh, ankle, and foot/toe increased considerably at 3-4% (Beerekamp *et al.*, 2017). Furthermore, fractures are expected to rise from 2.1 million in 2005 to more than 3 million by 2025 (Beerekamp *et al.*, 2017). Another study found that fractures had a large economic impact (Williams *et al.*, 2020). In Indonesia, around 13,000 orthopedic patients attend the Cipto Mangunkusumo Hospital, which receives 168,000 visitors every year. In comparison, the Fatmawati Central General Hospital handled 1328 orthopedic patients in 2010 (Aprisunadi, 2011).

As a result, the number of fractures increases year after year. Increasing the number of orthopedic disorders will also increase the number of treatments for orthopedic patients in hospitals. According to one study, the prevalence of accidents that could potentially result in fractures increased significantly from 8.2% in 2013 to 9.2% in 2018. Furthermore, the proportion of members who were frequently injured was in the lower extremities at 67.9 percent and in the upper extremities at 32.7 percent (Kementerian Kesehatan Republik Indonesia, 2018). As a result, prevention is critical to reducing fracture prevalence. This condition requires qualified orthopedic nursing care and prioritizes the safety of the patient. Orthopedic nursing is a specific care strategy used in the treatment of extremity fractures (Brent *et al.*, 2018) or orthopedic problems including bones, muscles, and nerves caused by both illness and non-disease causes (Rousset, 2015).

Orthopedic nurses assist in preventing, minimizing, and correcting orthopedic deformities, preventing joint fractures or dislocations, restoring the function of painful bones and joints, and preventing infections and injuries. Orthopedic nurses are responsible for optimizing and restoring orthodontic operations. If recovery is not feasible, the orthopedic nurse assists the patient to adjust to their situation or provides palliative care (Noorisa Riswanda; Apriliwati Dwi; Aziz Abdul; Bayusentono Sulis., 2017). Implementing nursing diagnoses will increase nursing documentation quality. The quality of nursing care documentation is used to assess nursing care quality (Setyaningrum *et al.*, 2019a). In general, as well as in specific fields such as orthopedics, good-quality nursing care and documentation are required. There are several aspects that impact the nursing process's execution. Nursing variables include information, especially for creating nursing diagnoses in developing nursing care plans, skill, experience, interest, and views of nurses about the value of the nursing process (Baraki *et al.*, 2017). So, the quality of nursing care has a significant impact on the image of any health care organization. (Kunjukunju & Ahmad, 2019).

In the field of health care quality assessment, Avedis Donabedian provided an instrumental framework consisting of structure, process, and outcome (Donabedian, 1966). The structure predominantly focuses on the nurse's characteristics, embracing their academic credentials, professional training, and the resources available in their working environment. Such structural elements play a pivotal role in determining the efficacy of nursing interventions, ensuring that these interventions are not only timely but also aligned with the highest professional standards.

On the other hand, the process component pertains to the tangible nursing interventions, mirroring the actual care provided to patients. The culmination of these interventions leads to the outcome, which represents the measurable results of care. Quality outcomes are reflective of effective interventions, suggesting that when nurses are well-equipped and their interventions are sound, patients invariably receive the pinnacle of care, ultimately enhancing the overall quality of nursing. Recognized nursing care qualities must be incorporated into the flexible learning educational approach as an innovative solution amidst pandemic to promote the principles of education through technological progress (Olapane *et al.*, 2023).

Nurses play an important role in providing nursing care to orthopedic patients, especially in the implementation of diagnosis and external and nursery interventions. Nonetheless, no studies have been conducted to explicitly assess the influence of nurses' variables on the quality of orthopedic treatment. As a result, this study aimed to see how nurses' characteristics affected the quality of nursing diagnosis, intervention, and outcome in orthopedic patients.

METHODOLOGY

Design of Research

A cross-sectional correlational analysis was carried out. We followed Strengthening the reporting of observational studies in epidemiology (STROBE) guidelines (Vandenbroucke *et al.*, 2014).

Participants

Nurses were recruited at the West Java Province Hospital in Indonesia. The sample strategy for both nurses and patients was consecutive sampling. All participants who satisfied the inclusion criteria were sampled

consecutively. This study was conducted from July to September 2022, and nurses (n=236) who met the study requirements and were willing to participate were recruited as participants. All participants were informed of the study's purpose, procedures, and confidentiality before participating. In addition, once participants had given an informed permission form, the researcher delivered a questionnaire to them.

Following the completion of an informed consent form, the researcher delivered a questionnaire to participants. Nurses who worked in the hospital as executive nurses in an orthopedic unit for at least two years, had a minimum education diploma in nursing, and were willing to participate in this study met the criteria for inclusion in the sample.

To collect data on nurse factors such as age, gender, education level, competence, knowledge, and skill in this study, we used a questionnaire. Procedure orthopedic nursing quality (diagnoses, interventions, and outcomes) is a dependent variable in this study. The accuracy of nursing diagnoses and the appropriateness of therapies and goods reported by participants based on the patient's condition constitute nursing quality. Nursing parameters such as age, gender, educational level, competence, knowledge, and skill, which serve as independent variables, must be included when evaluating the efficacy of nursing care. to get a thorough grasp of their impact on patient outcomes. Nursing variables are qualities of nurses that determine how nursing diagnoses are implemented.

To assess orthopedic nursing quality in this study, we used the Q-DIO (Quality of Diagnosis, Intervention, and Outcomes) instrument developed by Muller-Staub *et al*. (2006), modified by Aprisunadi (2011). The instruction consists of 29 Likert (1-4) question items divided into four categories: 1) Nursing diagnosis as a process includes 11 elements; 2) Nurse diagnosis as a product includes eight items; 3) Nurse intervention includes three items; and 4) Nursing outcome includes seven items. The quality of nursing care documentation evaluation results is determined by adding all scores on each criterion and then dividing by the maximum number of elements, which is 29. If the value acquired is more than two, the quality of nursing care is good; if the value obtained is less than two, the quality of nursing care is bad (Setyaningrum *et al.*, 2019).

The Q-DIO instrument has passed a validity test with r values ranging from 0.788 to 0.986, as well as a reliability test with Cronbach's alpha of 0.990 (Müller-Staub *et al*., 2008). Before collecting the data, the candidate participants explained the purpose of the study and were then asked to be willing to be voluntary participants. Any information provided by participants is kept confidential by not including the respondent's identity in the research document. The information submitted by participants is exclusively used for research purposes. Statistical Analysis Data is examined univariately (frequency distribution) to determine the frequency distribution and bivariately (chi-square test) to determine the correlation between nurse factors and nursing care quality. SPSS 26.0 (IBM, Armonk, NY, USA) was used to analyze the data. Statistical significance was $p <0.05$.

Ethical Consideration

The study obtained Ethical Approval from Ethics Committee of the University of Airlangga, Indonesia Faculty of Nursing with reference number 2540-KEPK on June 3, 2022, for this project.

RESULTS

Characteristics of Participants

The overall number of participants in this study was 236 nurses (n = 236). In the adult category, 107 nurses (45.3%) constituted most of the participants. With 145 participants (61.4%), nurses were mostly female. The majority of participants, 133 (56.4%), are nurses with a diploma level of education. With 143 participants (60.6%), the majority of participants had sufficient competence. The knowledge of the nurses' participants is both enough and less, with 99 (41.9%) and 98 (41.5%), respectively. With 180 participants (76.3%), the majority of nurse participants demonstrated good skills (Table 1).

Table 1: Nurses Characteristics (n=236)

Variables	Category	Frequency	Percentages (%)
Age	Late adolescence	19	8.1
	Early Adulthood	93	39.4
	Late Adulthood	107	45.3
	Early Elderly	17	7.2
Gender	Female	145	61.4
	Male	91	38.6
Educational Level	Postgraduate	4	1.7
	Undergraduate	99	41.9
	Diploma	133	56.4
Knowledge	Good	39	16.5
	Enough	99	41.9
	Less	98	41.5
Skill	Good	180	76.3
	Enough	54	22.8
	Less	2	0.9

The quality of the orthopedic nursing process for nursing diagnosis (97.4%), nursing intervention (96.1%), and nursing outcome (97.0%) were all good. (Table 2).

Table 2: Quality of Orthopedic Nursing Care (n=236)

Variables	Category	Frequency	Percentage (%)
Nursing Diagnosis	Good	230	97.4
	Poor	6	2.6
Nursing Intervention	Good	217	96.1
	Poor	9	3.9
Nursing Outcome	Good	229	97.0
	Poor	7	3.0

Gender, age, educational level, knowledge, and competence had no significant impact on the quality of nursing diagnoses for orthopedic patients ($p = 0.076$, $p = 0.465$, $p = 0.876$, $p = 0.563$, and $p = 0.478$, respectively) (Table 3). Gender, age, educational level, knowledge, and competence had no significant impact on the quality of nursing intervention on orthopedic patients ($p = 0.20$, $p = 0.356$, $p = 0.476$, $p = 0.899$, $p = 0.54$, respectively) (Table 4).

Table 3: Influence of Nursing Factors on the Quality of Nursing Diagnosis on Orthopedic Patients (n=236)

Variables	Category	Quality of Nursing Diagnosis		p Value
		Good	Poor	
Age	Late Adolescence	19 (8.3%)	0 (0%)	0.465
	Early Adulthood	91 (39.6%)	2 (33.3%)	
	Late Adulthood	104 (45.2%)	3 (50%)	
	Early Elderly	16 (6.9%)	1 (16.7%)	
Gender	Female	143 (62.2%)	2 (33.3%)	0.076
	Male	87 (37.8%)	4 (66.7%)	
Educational Level	Postgraduate	4 (2%)	0 (0%)	0.876
	Undergraduate	96 (42%)	3 (50%)	
	Diploma	130 (57%)	3 (50%)	
Knowledge	Good	38 (16%)	1 (16.7%)	0.563
	Enough	96 (42%)	3 (50%)	
	Less	96 (42%)	2 (33.3%)	
Skill	Good	174 (75.6%)	6 (100%)	0.478
	Enough	54 (23.5%)	0 (0%)	
	Less	2 (0.9%)	0 (0%)	

Nursing variables impacted the quality of nursing outcomes in orthopedic patients in relation to age ($p<0.05$). Gender, educational level, knowledge, and competence, on the other hand, had no effect ($p=0.285$, $p=0.144$, $p=0.978$, $p=0.147$, respectively) (Table 5).

Table 4: Influence of Nursing Factors on the Quality of Nursing Intervention on Orthopedic Patients (n=236)

Variable		Quality of Nursing Intervention		p Value
		Good	Poor	
Age	Late adolescence	19 (8.4%)	0 (0%)	0.2
	Early adulthood	89 (39.2%)	4 (44.4%)	
	Late adulthood	103 (45.4%)	4 (44.4%)	
	Early elderly	16 (7.0%)	1 (11.1%)	
Gender	Female	141 (62.1%)	4 (44.4%)	0.356
	Male	86 (37.9%)	5 (55.6%)	
Educational Level	Postgraduate	4 (1.8%)	0 (0%)	0.476
	Undergraduate	95 (41.8%)	4 (44.4%)	
	Diploma	128 (56.4%)	5 (55.6%)	
Knowledge	Good	38 (16.7%)	1 (11.1%)	0.899
	Enough	94 (41.4%)	5 (55.6%)	
	Less	95 (41.9%)	3 (33.3%)	
Skill	Good	171 (75.3%)	9 (100%)	0.54
	Enough	54 (23.8%)	0 (0%)	
	Less	2 (0.9%)	0 (0%)	

Table 5: Influence of Nursing Factors on the Quality of Nursing Intervention on Orthopaedic Patients (n=236)

Variable		Quality of Nursing Outcome		p Value
		Good	Poor	
Age	Late Adolescence	19 (8.3%)	0 (0%)	0.031*
	Early Adulthood	90 (39.3%)	3 (42.9%)	
	Late Adulthood	103 (45.0%)	4 (57.1%)	
	Early Elderly	17 (7.4%)	0 (0%)	
Gender	Female	142 (62%)	3 (42.9%)	0.285
	Male	87 (38%)	4 (57.1)	
Educational Level	Postgraduate	4 (1.7%)	0 (0%)	0.144
	Undergraduate	95 (41.5%)	4 (57.1%)	
	Diploma	130 (55.8%)	3 (42.9%)	
Knowledge	Good	38 (16.6%)	1 (14.3%)	0.978
	Enough	96 (41.9%)	3 (42.9%)	
	Less	95 (41.5%)	3 (42.9%)	
Skill	Good	173 (75.5%)	7 (100%)	0.147
	Enough	54 (23.6%)	0 (0%)	
	Less	2 (0.9%)	0 (0%)	

*P value < 0.05

DISCUSSION

Nursing diagnoses, interventions, and outcomes are all examples of quality in nursing care. The current study found that nurses were well-versed in the use of nursing diagnoses. Similarly, earlier research found that nursing diplomas and bachelors had a strong understanding of nursing diagnosis (Ebisa *et al.*, 2022; El-rahman *et al.*, 2017; Secer & Karaca, 2021). Other research has found that educational qualifications, training, and non-supportive hospital management are predictors of nursing process implementation (Adraro & Mengistu, 2020; Ebisa *et al.*, 2022). In line with prior research, 92% of nurses had adequate knowledge (Afolayan *et al.*, 2013). A review study also reported improving education and nurse behaviors influencing understanding of the nursing process (Danielis *et al.*, 2022; Mousavinasab *et al.*, 2020). This discrepancy, however, might be related to differences in nurses' awareness of the nursing process, training availability, individual-managerial factors, the reflection of the nursing process, and follow-up on nursing process implementation (Moghadas & Sedaghati Kesbakhi, 2020; Yilak *et al.*, 2022). Also, a previous study suggested that nurses' perceptions about the implementation of the nursing process influence the quality of care, patient safety, and nursing records (Da Silva *et al.*, 2021).

Our data revealed that nurses were proficient in utilizing nursing diagnoses. Like earlier research, there was an implication of expertise in enhancing the accuracy of the nursing procedure (Leoni-Scheiber *et al.*, 2020). A previous study in Northern Ethiopia found that more than sixty current nurses used and implemented the nursing procedure or nursing process (Yilak *et al.*, 2022). Another study found that 73.9% of the nursing process was implemented (Adraro & Mengistu, 2020).

Furthermore, our data revealed that nursing determinants impacted the quality of nursing outcomes in orthopedic patients as they became older. This finding is consistent with the previous study, which discovered a link between nursing diagnosis and nursing outcomes (Leoni-Scheiber *et al.*, 2020). A study found a statistically significant relationship between nursing parameters and the quality of nursing outcomes (Müller-Staub, 2009). Another study suggested the application value of continuous nursing intervention for improving the quality of life in patients (Han & Yu, 2021). Furthermore, ageism influences several elements of patients' nursing outcomes (Hwang & Kim, 2021). As a result, the factors influencing the quality of nursing outcomes were diverse.

The present study has some limitations. Firstly, because this study is cross-sectional, it can be difficult to identify the causal factors. Secondly, because this study was carried out in Indonesia, the results cannot be generalized to other countries; therefore, future research is needed.

CONCLUSION

Based on the results of the study, it can be concluded that the quality of the orthopedic nursing process for nursing diagnosis, nursing intervention, and nursing outcome was good. In addition, nurses' factors, such as age, had a substantial effect on the quality of nursing outcomes in orthopedic patients.

Based on the findings of this research, the following recommendations can be made: 1) Enhance competence; while a majority of the participants exhibited good competence, there's room for improvement. Continuous training programs and specialized workshops could be introduced to uplift the competence of nurses, especially those at the diploma education level. 2) Boost knowledge levels: Given that nearly half of the participants demonstrated only adequate or below-average knowledge, targeted training and continuous education efforts should be undertaken to elevate the knowledge levels of nurses in orthopedic care. 3) Maintain quality of nursing process: observing that the orthopedic nursing process (diagnosis, intervention, and nursing outcomes) is predominantly assessed as good, it's imperative to sustain and even enhance these standards. Periodic monitoring and audit programs can assist in this regard. 4) Consideration of age in nursing outcomes: As age appears to influence the quality of nursing outcomes, an individualized approach may be required when tending to orthopedic patients. Nurses should receive specialized training on how age can influence care and what measures need to be taken to address specific challenges that may arise.

Future research must be conducted utilizing a variety of research approaches and larger samples with a

variety of variables.

Conflict of Interest

The authors declare that they have no conflict of interest.

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