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REVIEW ARTICLE

COMPARATIVE ANALYSIS BETWEEN NURSING CORE COMPETENCY STANDARDS OF AUSTRALIA AND THE PHILIPPINES

Rainier C. Moreno-Lacalle

*Corresponding author:
Associate Professor Rainier C. Moreno-Lacalle, PhD, RN
Saint Louis University, School of Nursing SON Faculty Room, 5th Floor, Silang Building, Bonifacio Street, Saint Louis University, Baguio City, Philippines
Email: moreno@slu.edu.ph

Abstract

Philippines as one of the top producers of nurses worldwide must benchmark its national nursing standards to the rest of the world. Therefore, the standards must be compared and contrasted with other countries like Australia. The main purpose of this study is to compare and contrast nurse's competency and performance indicators between the Philippines and Australia nursing competency system. This is a review article guided by Donnelly and Weichula's Qualitative- Comparative Analysis (QCA). The process includes identification of the condition of interest, dichotomization and development of truth tables. Two official documents namely the Philippines' *National Nursing Core Competency Standards* and Australia's *National Competency Standards for the Registered Nurse* were selected as the condition of interest. Findings show that Australia adopted a one pronged-generalist, non-linear approach, and policy-based nursing education system while the Philippines emphasized on three-pronged specialization, work-based, and linear approach nursing competency standards. The Australia and Philippine nursing competency trails a different path in adopting standards for nursing education system. The strengths and weaknesses of each national nursing competency standards were discussed.

KEYWORDS

comparative analysis; competency standards; Philippines; Australia

INTRODUCTION

Globalization has led to augmented interdependence, increased demands, and more complicated system amongst and in-between countries (Deresky, 2014). The concept of globalization twins two separate states namely Australia and the Philippines. Smith (2009) quoted the Australian Ambassador to the Philippines that emphasized the strong bilateral relationship between the two countries, to wit unified by sizable number of immigrants housing 200,000 Filipinos. In Australia, the fifth largest source of migrant people are the health care workers including nurses. With this trend, the Philippines as one of the top producers of nurses to Australia need to keep abreast to this dynamism in order to sustain competitive advantage. This trend seems to be increasing. Micua (2012) reported that 40,000 nurses are needed in Australia. This intricate link mandates the Philippine government through the Philippine Professional Regulation Commission (PRC) to ensure that Filipino nurses have the necessary competencies to meet the nursing standards set by the Australia government.

The Philippines' Professional Regulation Commission (2014) developed *the National Nursing Core Competency Standards*. This breakthrough paves the way to the development of three competency standards among beginning nurse: on client care, on management and leadership, and on research. The Philippines' Professional Regulation Commission (2014) published the *National Nursing Core Competency Standards* which laid down minimum foundations of nurse's performance indicators in the country. In the same manner, the Nursing and Midwifery Board of Australia (2006) published the *National Competency Standards for the Registered Nurse* aiming to describe the expected competency framework of the registered nurses on entry to nursing practice.

To my knowledge, there is limited to no research that has examined the Filipino nurse's competency vis-à-vis Australian nurses' standard. The main purpose of this study is to compare

and contrast nurse's competency and performance indicators between Australia and the Philippines.

METHODS

This review article was guided by Donnelly and Wiechula (2013) Qualitative- Comparative Analysis (QCA). This process is defined as the "family of comparative techniques that aim to explain macro-social phenomena in a parsimonious way while working with small- to medium-size data sets" (Vink & Van Vliet, 2009). Ragin and Zaret (1983) defended the compatibility of QCA in exploring and generalizing sociological analysis saying "methodological procedures, no matter how narrowly construed, allow priorities laid down by theoretical interests and commitment" both in scientific and epistemological viewpoint. Achen (2005) claimed that the goal of this type of qualitative method is similar to capturing the multiple conjunctural causation were the linear statistical tool fails to describe in a complex social structure. QCA method is subdivided into two: congruency and convergence. Though mutually exclusive (Ragin & Zaret, 1983), this review article is leaned to congruency to create more formidable frontiers in the divergence of the two national core competencies.

QCA is also known as systematic comparison (Ragin & Zaret, 1983). This is utilized to create symmetry, highlighting the difference of "complexity and generality in sociological analysis." Central to this methodological strategy is to compensate the "absence of theoretical interests that guide construction of one-sided type concepts" (Ragin & Zaret, 1983). Somehow precarious and novel method, Ragin and Zaret (1983) put QCA on pedestal saying that it has logical adequacy personifying "methodological strictures, substantive interest, and epistemological commitment." Donnelly and Wiechula (2013) enumerated two distinct processes ought to be followed: (1) identifying the conditions of interest and (2) dichotomization then the truth tables. The researcher selected the two official documents namely the Philippines' *National Nursing Core Competency Standards* and Australia's' *National Competency Standards for the Registered Nurse* as the condition of interest. Each of the document were read in its entirety and was compared and contrasted to other national nursing competencies. Dimensions of the comparison were identified and developed by the researcher. Then the truth table was developed and discussed.

RESULTS AND DISCUSSIONS

 The Philippine national nursing core competency standards and the Australian national competency standards for the Registered Nurses is the nexus of the study. The conditions identified are number of domains, entry gate-keeping, ramification, feasibility, basis, direction, specific provision, and policy making involvement. The study found out that the two standards are almost similar in some aspects and dissimilar in nine dimensions. Perhaps other differentiations are the inherent cultural biases, degree of application, the usability context, and impact it will made in the future of the nursing profession.

The domains on these two competency standards are different. The Australia's number of nursing competency is four as shown in Table 1. These are the descriptions that an entry-level nurse should possess. The first domain is professional practice which relates to the professional, legal, and ethical roles and responsibilities towards its clientele and the society as a whole. The second domain involves the critical thinking and analysis described as the process of self-critiquing, knowing the scientific footing of the profession, and the inherent obligation to improve it. Third domain is the provision and coordination of care encapsulated as the organizational role of the nurse regarding the nursing plan of care. Lastly is the collaborative and therapeutic practice simply put as building relationship with individuals and group.

The Philippine nursing competency is based on work scenario analysis. First, the role of the nurse on client care. This involves the adhesion to ethic-moral and legal responsibilities, records management, collaboration, and the professional growth. Second the essence of management and leadership in the nursing practice. This can be exemplified in the leadership and management skills both in the clinical or community setting. Last is the role on research. There is a need to continuously improve nursing science through quality improvement, nursing audit, and utilization of available reference.

The divergence sets on entry gatekeeping. Australian nurses preferred a generalist one-prong approach while the Philippine nurses opted specialized-three-pronged approach. The primary approach used in Australia is the development of self, others, and community through critical thinking, coordination, and collaboration. These are universal features and competency in nursing practice. The Philippines footing is different, setting on the three major roles of nurses: bedside, leader/manager, and researcher. Both these approaches have pros and cons. Too much generalist may mean confusion since the roles is unclear while specific roles may limit the nurse and no longer explore innovative and novel ways to practice nursing. Philippine nursing standards highlights the three major role of a clinician nurse while Australian nursing competency deals emphasizes entry level competency.

Most tension can be felt on the ramification, feasibility, basis, and direction of the nursing core competency. Truth be told that the dichotomization between the two nursing competencies needs revisiting as gleaned on Table 1. The broadness on the Australian nurse's competency ramifies incessantly because the role is unclear, boundaries appeared without limit, and the horizon role is extremely wide. Although feasibility is likely since that approach is the usual practice in today's nursing. The arrangement basis and the competency-fundamentals are almost similar to the nursing process. The non-linear attitude of the Australian nursing competency may work today but may pose problems in the future. The main aim of the Australian approach seems unclear because of the seemingly blurs pathway. Whether the competency standards lead to Advanced Practice Nursing needs further elaboration.

Table 1 Dichotomization and Truth Table

Dimensions	Australia Nursing Competency	Philippine Nursing Competency
1. Number of domains	Four ➤ Professional practice ➤ Critical thinking and analysis ➤ Provision and coordination of care ➤ Collaborative and therapeutic practice	Three ➤ Beginning nurse's role on client role ➤ Beginning nurse's role on management and leadership ➤ Beginning nurse's role on research
2. Entry gatekeeping	Generalist (one-pronged)	Specialization (three-pronged)
3. Ramification	Complicated	Specific
4. Feasibility	Yes	Maybe (unsure)
5. Basis	Nursing-process based	Work-based
6. Direction	Non-linear	Linear
7. Provisions on caring across race, culture, religion, age, gender, sexual preference, physical or mental state.	Explicit	Implicit
8. Policy making involvement	Yes	Limited

Perhaps protracted competencies guide like these implicitly supports Carper (1978) four patterns of knowing, which hold true to the ideals and science of the nursing profession. A study in Queensland by Eley et al. (2013) posited that constricted career progression may heed nurses to leave the nursing practice. The significant reduction in nursing career perhaps affects nurse's career advancement. This might be the reason why the horizon of nursing epistemology in Australia is limitless and borderless. In Portugal, for instance, Nunes (2019) discussed the history of research integration in their academic nursing history. This implies the importance given by various nursing competency developers on science among beginning nurses.

On the other hand, the Philippine nursing core competency seems to be geared towards specialization through three-pronged and work-based approach. The feasibility might pose problems when linearity aspect is not given due attention. The three-pronged approach is clearer and may serve more as guide for entry level nurses. On the other hand, this might pose problems on the educational footing of the neophyte nurses. For example, doing research must be based on rigorous process before it will be called science. If the background footing of a novice nurse is sloppy and 'un-scientific', he/she might adverse research. The point is the role that core competency standards proves is too idealistic and specific. The idealism of the Filipino nurse competency especially along research might be skewed.

The research group had to discover knowledge through close coordination to these two specialists the management to ease out the process, while the practice feedback the research and management to the tensions inside the practice. Therefore, the gap between the theory, research, and practice is shortened. The bottom line is that this linear direction sets a clear footing on Advanced Nursing Practice (APN). This is important because it will set the direction of APN practice to developing and developed countries alike. This situation is true to other Asian countries like Japan, Taiwan, and Thailand were the career

pathways to guide and retool nurses on their routes towards advancing nursing practice is facilitated by the system, policy, and the strong foothold of nursing science (Chiang-Hanisko et al., 2008). Pressures to nursing competency developers like Egypt can be felt to set the national standards at par internationally (Brownie et al., 2018).

In order to be globally competitive a nurse has to consider the worldwide changes that may affect the delivery of health care services. Variables like race, culture, religion, age, gender, sexual preference, physical or mental state may dictate the preferred nursing care of these clientele. Wilson and Jallah (2019) exposed the importance of transcultural competency especially when working abroad. The Australian competency has been explicit about it since they are nation of immigrants. On the other hand, the Philippines despite of the large exodus of nurses abroad has somehow left the transcultural nursing competency in the national standards. Although the code of ethics explicitly states it, no performance indicator addresses this significant competency. The Australians have been explicit about the caring across different profile. Plus, the strength of the Australian competency is that it involves nurses on health policy making while in the Philippines it seems unclear. Whether we like it or not, policy making is an important competency that should be taught to beginning nurses. The politics in the health care delivery system need not to be ignored. Notably, important trends and issues were not addressed in the two national nursing competencies including genomics, informatics, and emerging health trends. Modernization of the nursing competency standards to cope with the needs of the 21st century health workforce has been called for by the National Council of State Boards of Nursing (2018).

CONCLUSIONS

Despite the susceptibility of the Qualitative-Comparative Analysis (QCA) method to the discriminatory power of the

researcher, several significant inferences can be drawn. There are advantages and disadvantages in the application of the two national nursing core competencies. QCA can be used as method to identify the strengths and weakness of each policy by means of scientific comparison. Clear differences between the Philippine and Australian national nursing competencies were noted. Both the ideologies and application have its own respective strengths and weaknesses. The researcher recommends revisiting the National Nursing Competency standards of the two selected countries.

ORCID
Rainier C. Moreno-Lacalle https://orcid.org/0000-0002-7844-4424

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ORIGINAL RESEARCH

EFFECT OF NANDA-I, NIC, AND NOC DOCUMENTATION SYSTEM TRAINING ON QUALITY OF NURSING CARE DOCUMENTATION IN THE PERINATAL WARD OF YOGYAKARTA REGIONAL PUBLIC HOSPITAL

Enny Eko Setyaningrum[1*], Intansari Nurjannah[2], Anik Rustiyaningsih[3]

[1]Master of Nursing, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Indonesia
[2]Department of Mental Health and Community Nursing, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Indonesia
[3]Department of Child and Maternal Nursing, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Indonesia

*Corresponding author:
Enny Eko Setyaningrum
Master of Nursing, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada
Mlaten RT01/05 Pandowoharjo Sleman Yogyakarta 55512
Email: gendhis_enny@yahoo.co.id
Mobile: 081392562344

Abstract

Background: The existing standard of nursing language consists of NANDA-I for diagnostic language standard, Nursing Intervention Classification (NIC) for nursing intervention, and Nursing Outcome Classification (NOC) for nursing outcomes. One way to improve the quality of nursing care documentation is to provide training in the documentation system.

Objectives: To determine the effect of providing NANDA-I, NIC, and NOC (NNN) nursing care documentation systems training on the quality of nursing documentation.

Methods: This was a pre-experimental study with pretest posttest design without a control group. Twenty-one nurses and eighty-six Medical Records (MR) of patients who were treated in the perinatal ward of Yogyakarta Regional Public Hospital were used as samples selected using purposive sampling. Those nurses were trained in the nursing care documentation system. The quality of nursing care documentation was measured using modified Quality of Diagnoses, Interventions and Outcomes (Q-DIO) instrument. Data were analyzed using Independent samples t-test with a confidence level of 95%.

Results: The average of the scores of the quality of nursing documentation before training was lower (1.91) than the average after training (2.78). There was a significant difference in the quality of nursing documentation before and after training ($p < 0.001$).

Conclusion: Training of NNN nursing documentation system could improve the quality of nursing documentation in the perinatal ward of Yogyakarta Regional Public Hospital.

KEYWORDS
training; nursing documentation; documentation

INTRODUCTION

Good and detailed nursing documentation can describe the patient's condition, progress in the patient's condition, and contribute to the continuity of patient care, subsequent treatment plans, while providing information to evaluate the success of the actions given, and health indicator data (Linch et al., 2017). Nursing documentation also can provide many benefits as a means of quality assurance, accreditation, legal evidence, health planning, allocation of resources and development of nursing and research (Nursalam, 2011; Wang et al., 2011).

Nursing documentation is also important in nurses' communication with their fellow nurses and other health workers. Communication with other health teams needs to be supported by good and standardized nursing documentation so that it is easily

understood and perceptible by other health workers. Important aspects that should be written in the documentation include nursing diagnosis, intervention and outcome target. The use of standard nursing diagnoses, interventions and results that are widely used are NANDA International (NANDA-I) systems, Nursing Intervention Classification (NIC) and Nursing Outcomes Classification (NOC) or known as NNN (Müller-Staub et al., 2009).

Implementation of standardized language in establishing NNN nursing diagnoses will improve the quality of nursing care documentation. Various studies have been conducted to determine the effectiveness of the use of NNN and the results of one study indicated that the use of NNN can improve the quality of nursing care (Muller-Staub et al., 2007). A systematic review conducted by Wang et al. (2011) states that many studies have been done to develop the quality of nursing documentation. The quality of nursing documentation can be evaluated from the format and structure of the documentation, the process of documentation, the contents of nursing documentation and instruments to measure the quality of nursing documentation. Some of the instruments that can be used to measure the quality of nursing documentation are: The Cat-Ing instruments, Ehnfor's instruments and the Quality – Documentation, Intervention, Outcome (Q-DIO) instruments (Wang et al., 2011).

Nursing care quality is measured by assessing the quality of nursing care documentation. Assessment of the quality of documentation is a method to improve the quality of nursing care (Muller-Staub et al., 2009; Wilson et al., 2012). Activities that can be used to improve the quality of nursing documentation include electronic documentation systems, standardization of documentation systems, standardization of nursing languages, nursing process models, standardization of nursing documentation education, documentation education in specific nursing, using specific nursing theories or a combination of some of the above interventions (Wang et al., 2011). Nurses who work in special areas such as nurseries also have an important role to provide good quality nursing care and good documentation. Good and accurate documentation can strengthen the accountability of nurses in the nursery (Cartwright-Vanzant, 2010). Based on that information, this study aimed to determine the effect of providing a NNN documentation training system on the quality of nursing care documentation in the perinatal ward Yogyakarta Indonesia.

METHODS

Study Design
This quantitative research used a pre- experimental one group pre-test post-test design.

Setting
The study was conducted in the Perinatal Ward of Yogyakarta Regional Public Hospital. The number of nurses in the ward numbered 22 nurses. The research was conducted from July to October 2018.

Sample
The sample in this study were two groups, namely the Perinatal ward nurses, 21 nurses and the MR (Medical Record) of patients who were treated in the perinatal ward of Yogyakarta Regional Public Hospital. The number of infant patients treated in the Perinatal ward in one year in 2017 in 752 infants. Purposive sampling method was used in this study.

Samples of perinatal ward nurses were selected based on inclusion criteria: 1) Nurse in the perinatal ward of Yogyakarta Regional Public Hospital, 2) Taking a part in the documentation system training, 3) Willing to be a respondent. The exclusion criteria were nurses who were taking time off or preparing for retirement or being sick during data collection.

Sample of medical records were selected based on inclusion criteria: 1) The patient's Medical Record (MR) was filled out by nurses who attended in full for the NNN documentation system training, 2) MR documents of patients treated in the perinatal ward that have been documented in the nursing process in one cycle in one shift, namely assessment, planning, implementation, and evaluation, 3) The patient's MR document with the criteria: the baby is born with a pregnancy age <33 weeks, the baby is born with a weight of <1500 grams or> 2500 grams, the baby is born without medical devices, the baby is born with congenital abnormalities, the baby is born with a good score in APGAR measurement, infant with using Continuous Positive Airway Pressure (CPAP) or ventilator devices, infant born with no special monitor or attention (can be more than one criterion). The exclusion criteria included: 1) The patient's MR unclear document documenting the nursing process and not clear who sign it, 2) MR documents that are not yet complete.

The research samples were determined by using the formula of the sample estimated average proportion with the Isaac Michael approach (Noor, 2011). Based on calculations using the formula, it was found that 86 nursing care documents were recommended for each pre and post-test.

Instrument
The strength of Q-DIO is its ability to measure the quality of nursing diagnoses and related interventions and nursing-sensitive patient outcomes (Muller-Staub et al., 2009). The researchers used the Q-DIO that had been modified by Aprisunadi (2011) originating from Muller-Staub et al. (2009) to measure the quality of nursing care documentation. Permission was granted from Aprisunandi and Muller for the researchers to use this instrument. This Q-DIO from Aprisunadi has 29 item criteria by dividing the quality of diagnostic nursing care documentation by process consisting of 11 items, product-based diagnosis consisting of 8 items, nursing intervention documentation consisting of 3 items, and nursing outcomes consisting of 7 items. The researchers modified the assessment score of the instrument on each criterion by setting a score of 0-4 for all assessment criteria, where a score of 0 was used if the documented information is incomplete, score 1 if the documented information is half complete, score 2 if the documented information is complete, score 3 if the information is fully documented, and score 4 if the documented information is very complete.

The results of the assessment of the quality of nursing care documentation are obtained by summing all scores on each criterion then dividing it by the maximum number of items which is 29. If the value is obtained> 2, the quality of nursing care is rated good and if the value obtained is ≤ 2 then the quality of nursing care is considered less than good.

Validity Test and Reliability Test of Instrument Sheets
The researchers did not test the validity of the Q-DIO sourced from Aprisunadi (2011). The researchers modified the quality aspects in the part of the nursing documentation as a process. Modifications were made by making adjustments to the nursing care assessment document on the RM used in the Perinatal Ward of Yogyakarta Regional Public Hospital. The modifications made can be seen in the table below (**Table 1**).

Table 1 Modification of Q-DIO Instruments

No	Q-DIO (Aprisunadi, 2011)	Q-DIO Modified Research 1	Q-DIO Modified Research 2
1.	The actual situation, cause of undergoing hospital treatment	General information (main complaint)	General information (main complaint)
2.	Anxiety and worry due to undergoing treatment, hopes, and desires about treatment.	Psychological status (anxiety and worry)	Psychological status (anxiety and worry)
3.	Social situation and environment of the residence	Maternal history (social situation and living environment)	Maternal birth history (social situation and neighborhood)
4.	Coping the patient in facing his current condition	Coping mother of the patient/family is facing the current condition of the baby	Physical assessment: Head, respiratory system, cardiovascular system, gastrointestinal system, extremity, skin, nutrition, elimination
5.	Beliefs and behavior (related to hospital care)	Life beliefs and behaviors (values and beliefs)	Life beliefs and behaviors (values and beliefs)
6	Information on the situation of patients and families / related people	Recipient's education identity (Need translator to speak, sign language, level of education, religion, willingness to receive information)	Recipient's education identity (Need translator to speak, sign language, level of education, religion, willingness to receive information)
7.	Closeness to people in the environment	The closeness of infant to mother/caregiver	APGAR, NIPS, and VS
8.	Hobbies, leisure activities	Mother/caregiver leisure time	Language used
9.	People who can be contacted or responsible for patients	People who responsible for patients	Barriers assessment of education recipients
10.	Daily living activities	Information and education needs	Information and education needs
11.	Relevant nursing priorities related to assessment	Relevant nursing priorities related to assessment	Relevant nursing priorities related to assessment

The reliability test performed on the instrument is the inter-rater reliability test (Kohen's Kappa). Bujang and Baharum (2017) recommends using a minimum of 11 or 28 samples for interrater reliability measurements. Analysis with Kohen's Kappa has meaning: no agreement <0.00; low 0.00-0.20; Fair (0.21-0.40; moderate 0.41 to 0.60; substantially 0.61-0.80; very strong 0.81-1.00. The kappa coefficient value of 0.61 represents a fairly good overall agreement (McHugh, 2012).

Interrater reliability tests were done on three observations of medical records. Every time before the data collection activities, the researchers conducted the measurement of perception similarity with the two raters. The first inter-rater reliability data collection activity involved 7 samples. The results of the collection in the first stage resulted in the Kohen's Kappa value being 0.236 (fair). The result of this first step measurement shows that the value of the interrater reliability was still low, so the researcher made modifications to the instruments in items number 1-10.

After the researchers made modifications to the instrument as described above, they performed this activity again with the raters before re-measuring it in 10 medical record files. The results of this second measurement obtained the Kohen's Kappa value of 0.725 (substantial).

The researchers then modified the instrument by adding instructions in filling out the form, namely the preparation of the instruction sheet, using the observation sheet and by modifying the contents in items 4, 7.8 and 9 (see **Table 1**). After the modifications were done, the researchers again tested the reliability with two raters while observing 12 different medical record files. Kohen's Kappa value for this third measurement was 1.00, which is in the very good range.

Data Collection
The researchers used only one group design because there was only one perinatal room in this hospital. The researchers did not conduct data collection in another hospital as they had some difficulty in applying the instruments that had been adjusted to the medical records in this hospital. To control any bias, the

researchers were not included in the data collection and recruited two observers from nurses in the postpartum ward. Those two observers were raters in the process of the previous testing on the reliability of the instrument. There were 21 nurses attended the training series until it was finished, and there was only one nurse who could not attend the training due to being on annual leave outside of Java.

Pre-test research samples were measured from the medical record files of patients who had returned home 7 days before the training started. Samples were chosen with non-probability sampling techniques using consecutive sampling, namely all medical records of patients who arrived in sequence and met the inclusion criteria (Sastroasmoro, 2014). The pre-test data were obtained from the medical record files of patients who had been discharged from the hospital on or before 22 July 2018. This data collection activity was conducted until the researchers obtained as many as 86 medical record files by the criteria.

The training for nurses consisted of three stages. In the first stage of the NNN, the nursing care documentation system (stage/lecture and discussion) was explained on July 29, August 4, and August 5. After that, the researcher continued the training in the second stage, namely the mentoring stage. This assistance was done from 30 July to 3 August and 6 August to 12 August 2018. Evaluation of training to determine the quality of training and knowledge of nurses was done after the series of training in the three stages was completed. Evaluation of the training used the Kirkpatrick method.

Post-test data were collected 14 days after the training series was completed, by collecting medical records of patients treated within August 27, 2018, until October 20, 2018. Similar to the pre-test data, researchers stopped collecting data when the sample fulfilled the 86 medical records.

Ethical Considerations
The research was conducted after receiving a letter from the Ethics Committee Approval, with a Ref: KE / FK / 0660 / EC / 2018 number dated July 5, 2018, from the Ethics Committee for Biomedical Research, Faculty of Medicine, Universitas Gadjah Mada. Researchers recruited respondents by using the inclusion and exclusion criteria, then the candidate of respondents was explained the study and the researchers asked for informed consent forms to be signed if they were willing to participate in this study.

Data Analysis
The analysis in this study used univariate and bivariate analysis. Univariate analysis is a data analysis that analyzes one variable. This analysis was applied because the initial data collection process was still random and abstract, then the data was processed into relevant information (Donsu, 2017). Bivariate analysis is a data analysis that recognizes the dual sides of two variables. Bivariate analysis was conducted to determine the differences in the quality of nursing documentation before and after training.

The data used in the quality of nursing care documentation are numerical so the total number of 29 previous observation items

obtained a minimum of 0 and a maximum of 116. Before the data were analyzed normality was tested using the Kolmogorov-Smirnov test because the research respondents were more than 50 MR, with normal data distribution if $p > 0.05$. Next, normally distributed data were analyzed using unpaired t-tests or Independent sample t-tests to compare the results between the pretest and posttest. The results of the analysis were considered significant if the value of $p < 0.05$.

Intervention
The intervention of the training was divided into three stages, namely the first phase of the seminar/lecture, the second stage was mentoring with real cases in perinatal, and the third stage was the evaluation of completing NNN nursing documentation. The training was divided into three periods because some nurses had a different shift schedule which did not allow all nurses to attend the training at the same time (**Figure 1**). The speakers in this training were also still actively working from Monday to Saturday so that the training schedule was also adjusted for the schedule of the resource persons so that not all groups were present in the morning but only attended in the afternoon until the evening.

The training in each session included:
1) First stage Seminar
   Consisting of 3 sessions:
   a) Opening by moderator
      • Opening by moderator and prayer
      • Introducing the name of the researcher
      • Explain the aims and objectives of the training
      • Explain the training plan for 3 days
   b) The first session with lectures and discussion questions and answers for 100 minutes.
      • Introduction of the resource person
      • The resource person explored the participants' understanding of nursing care documentation
      • The resource person explained the material: nursing care documentation, nursing process, NNN standardization, and the quality of nursing care documentation by the training module using Power-point.
      • After the explanation was over, the participants were encouraged to discuss with the speakers.
      • Take a break
   c) Then the second session was held for 100 minutes which contained material about the form that must be filled in for the nursing care documentation using the form in the Yogyakarta Hospital.
   d) ISHOMA
   e) Session 3 was conducted for 100 minutes containing examples of cases.
      • Groups in the first class were divided into two groups given cases to be worked out in small groups and then they discussed together in one class with the resource person.
2) Second stage / mentoring stage
   Only nurses who participated in the first stage underwent the second stage, namely the nurse works as usual by the work schedule in the perinatal room accompanied by a facilitator. The nurse completes nursing documentation on the patient's RM sheet, as usual, using the knowledge obtained during the

first phase of training. The results of the practice of each nurse were documented by the researchers and became the subject of discussion in the third stage. This stage was done for 5 days and all nurses who took part in the training worked on documenting at least one patient's RM file.

3) Stage three / Stage of Discussion
The third day session lasted 100 minutes, and was done in three waves (three days) with the consideration that it did not interfere with the nurses' working time. In this discussion stage, researchers as facilitators delivered the results obtained when mentoring. The results of the mentoring were provided for 3 days so that they could cover all nurses who attended the training. This evaluation is conducted for 2 days, namely 14 and 15 August 2018. After all stages were completed, the participants completed an evaluation questionnaire for the implementation of the training, which was used to see whether the training had been run well.
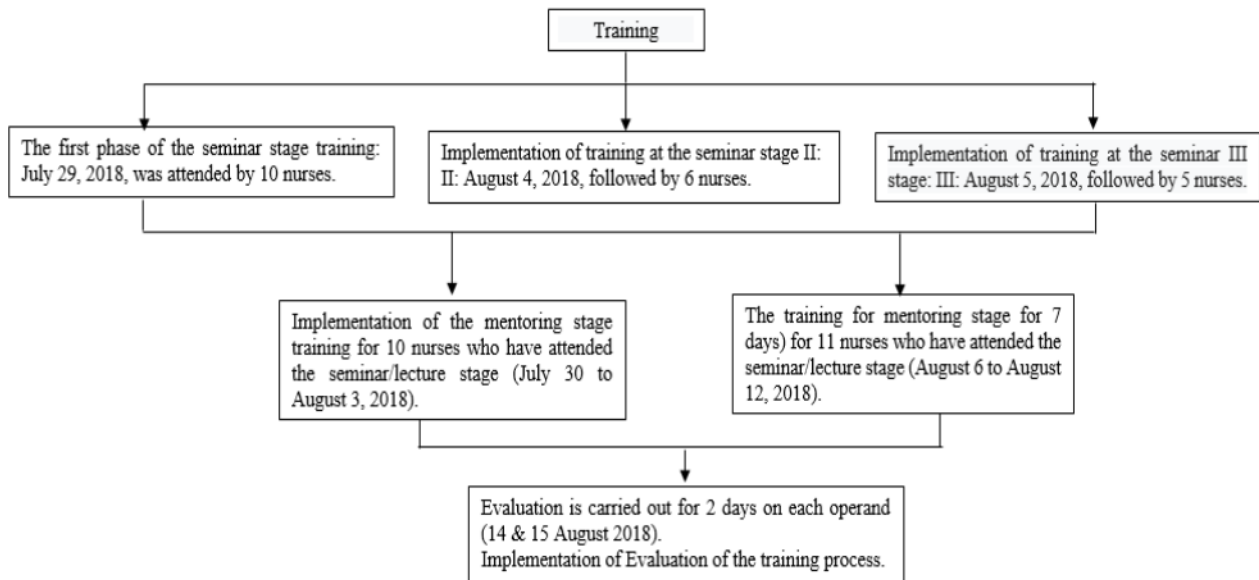
Figure 1 Three Phases of Training

RESULTS

The results of this study reflect three different aspects. The researchers described the characteristics of the respondents followed by an overview of the quality of nursing documentation, and the relationship of training to the quality of nursing documentation.

Characteristics of Research Respondents

Table 2 Characteristics of Perinatal Nurses in Yogyakarta Regional Public Hospital (n = 21)

Characteristic	Criteria	N	%
Age	20 – 40 years old	18	85.7%
	41 – 60 years old	3	14.3%
	>60 years old	0	0
Total		21	100%
Education	D3	11	52.4%
	D4	1	4.8%
	S1 Kep (Ners)	9	42.8%
Total		21	100%
Years of Service	<5 years	7	33.3%
	5-10 years	6	28.6%
	>10 years	8	38.1%
Total		21	100%

Quality Overview Nursing documentation

Table 3 Overview of the Quality of Nursing Documentation in General in the Perinatal Ward Before and After Training (n=86)

Variable	Criteria	Before f (%)	After f (%)
Nursing Documentation Quality	Good	30 (34.9%)	83 (96.5%)
	Poor	56 (65.1%)	3 (3.5%)

Table 3 shows that the quality of general nursing documentation from all aspects before training which has good quality has increased from 34.4% to 96.5%. Thus, the quality of nursing documentation already in good criteria improved.

Table 4 Overview of the Quality of Nursing Documentation at Each Q-DIO Aspect / Domain Before and After Training (n=86)

Variable	Criteria	Before		After	
		N	%	N	%
Nursing Documentation Quality as a Process	Good	73	84.9	69	80.2
	Poor	13	15.1	17	19.8
Nursing Documentation Quality as a Product	Good	1	1.2	72	83.7
	Poor	85	98.8	14	16.3
Nursing Intervention Documentation Quality	Good	1	1.2	78	90.7
	Poor	85	98.8	8	9.3
Nursing Outcomes Documentation Quality	Good	3	3.5	82	95.3
	Poor	83	96.5	4	4.7

The documentation of nursing as a product before the training had poor quality as much as 85 (98.8%) and good quality as much as 1 (1.25%) and after the training in this study, the researchers still found the poor quality as much as 14 (16.3%). As a result, from the **table 4** it can be seen that the quality of nursing documentation increased in overall nursing documentation, nursing documentation as products, nursing interventions and outcomes.

Before the bivariate analysis was done, first the data was assessed for its homogeneity or similarity. The data in this study included 86 (> 50) samples so the normality test used was the Kolmogorov-Smirnov test. The pre-test results had a p value of 0.036 or smaller than 0.05 while it can be said to be homogeneous if $p > 0.05$. The results of the post-test score had a p value of 0.89 or more than 0.05. This non-homogeneous post-test score was adjusted for normality and transformed with SPSS and the result was p-value = 0.020 or more than 0.05. From the results above, it can be concluded that the pre and post-test scores have a value of $p > 0.05$ so it can be concluded that the pre and post-test scores were homogeneous.

Relationship to Training with the Quality of Nursing Documentation

The results of this research data were homogeneous, so an unpaired t-test was performed on data before and after training with a confidence level of 95% ($\alpha < 0.05$). **Table 5** shows the data concerning the effect of training on the quality of nursing documentation. There were significant differences in the mean values before and after training.

Table 5 Differences in Quality Score of Nursing Care Documentation Before and After Nursing Documentation System Training CI 95% (n=86) using unpaired t-test

Aspect	Before Mean ± SD	After Mean ± SD	Mean Difference	p
Nursing Documentation Quality	1.91 ± 0.25	2.78 ± 0.41	0.86	<0.001

Table 6 Differences in Scores Before and After Training on Observation Items Quality of Nursing Documentation (n = 86)

No	Item	Before Mean ± SD	After Mean ± SD	Mean Difference	CI 95%	p
	Nursing Documentation as a Process	**2.68 ± 0.57**	**2.82 ± 0.65**	**0.13**	**-0.31 – (-0.42)**	**0.160**
1	General information	3.38 ± 0.56	3.41 ± 0.62	0.23	-0.201 – 0.15	0.796
2	Psychological status	4.00 ± 0. 00	3.91 ± 0.50	-0.93	-0.01 – 0.20	0.086
3	Maternal birth history	1.83 ± 0.81	2.63 ± 0.88	0.80	-1.06 – (-0.54)	<0.001*
4	Physical assessment	3.28 ± 0.60	3.50 ± 0.77	0.22	-0.42 – (-0.02)	0.028*
5	Life-beliefs and behaviors	1.05 ± 1.75	0.98 ± 1.73	-0.07	-0.45 – 0.59	0.793
6	Recipient's education identity	3.50 ± 1.29	3.33 ± 1.49	0.17	-0.24 – 0.60	0.413

Table 6 Differences in Scores Before and After Training on Observation Items Quality of Nursing Documentation (n = 86) (Cont.)

No	Item	Before Mean ± SD	After Mean ± SD	Mean Difference	CI 95%	p
7	APGAR, NIPS dan VS	3.19 ± 1.12	2.58 ± 1.25	-0.60	0.23 – 0.98	0.001*
8	Language used	3.20 ± 1.60	2.94 ± 1.75	-0.26	-0.21 – 0.72	0.319
9	Barriers assessment of education recipients	2.84 ± 1.83	2.74 ± 1.87	-0.09	-0,40 – 0.58	0.742
10	Information and education needs	1.64 ± 1.24	1.71 ± 1.33	0.07	-0.45 – 0.31	0.722
11	Relevant nursing priorities related to assessment	1.66 ± 0.64	3.29 ± 0.81	1.63	-1.84 – (-1.41)	<0.001*
	Nursing Documentation as a Product	**1.10 ± 0.24**	**2.63 ± 0.60**	**1.53**	**-1.67 – (-1.39)**	**<0.001**
12	Nursing diagnoses documentation	2.22 ± 0.71	3.41 ± 0.76	1.18	-1.41 – (-0.96)	<0.001*
13	Nursing diagnoses built according to NANDA-I and arranged based on priority	2.09 ± 0.70	3.19 ± 0.83	1.09	-1.34 – (-0.85)	<0.001*
14	Documenting etiology (E)	0.12 ± 0.42	3.14 ± 0.87	3.02	-3.24 – (-2.80)	<0.001*
15	Right etiology, related to nursing diagnoses	0.12 ± 0.47	3.14 ± 0.81	3.02	-3.23 – (-2.82)	<0.001*
16	Documenting signs and symptoms	0.02 ± 0.22	0.77 ± 1.29	0.73	-1.03 – (-0.46)	<0.001*
17	Signs and symptoms (S) exactly related to nursing diagnoses	0.02 ± 0.22	0.76 ± 1.27	0.73	-1.30 – (-0.88)	<0.001*
18	Nursing objective related to nursing diagnoses	2.30 ± 0.60	3.37 ± 0.70	1.07	-1.16 – (-0.88)	<0.001*
19	Nursing objective can be obtained through nursing intervention	1.94 ± 0.58	3.29 ± 0.68	1.35	-1.54 – (-1.16)	<0.001*
	Nursing Intervention Documentation Quality	**1.40 ± 0.35**	**1.62 ± 0.24**	**1.63**	**-1.76 – (-1.50)**	**<0.001**
20	Concreate	1.97 ± 0.58	3.28 ± 0.64	1.31	-1.50 – (-1.14)	<0.001*
21	Nursing intervention affects E from nursing diagnoses	0.13 ± 0.48	3.12 ± 0.71	2.99	-3.18 – (-2.80)	<0.001*
22	Nursing intervention that has been done, clearly documented	2.10 ± 0.46	2.70 ± 0.70	0.59	-0.76 – (-0.42)	<0.001*
	Nursing Outcomes Documentation Quality	**1.62 ± 0.24**	**2.77 ± 0.49**	**1.15**	**-1.26 – (-1.04)**	**<0.001**
23	Diagnoses relevance assessed every day in accordance to patient's condition that change	2.93 ± 0.73	2.93 ± 0.73	1.35	-1.56 – (-1.14)	<0.001*
24	Nursing diagnosis rewritten when recording evaluation	2.47 ± 0.63	3.15 ± 0.73	0.69	-0.84 – (-0.53)	<0,001*
25	Documentation of patient's progress record (SOAP)	3.05 ± 0.40	3.91 ± 0.36	0.86	-0.98 – (-0.74)	<0.001*
26	Patient's progress observed according to outcomes criteria that has been built before	1.64 ± 0.67	2.79 ±0.78	1.15	-1.37 – (-0.93)	<0.001*
27	Patient's progress record	1.48 ± 0.55	2.20 ± 0.57	0.72	-0.89 – (-0,55)	<0.001*
28	Outcomes criteria related to nursing intervention	1.59 ± 0.66	2.29 ± 0.76	0.70	-0.92 – (-0.48)	<0.001*

Table 6 Differences in Scores Before and After Training on Observation Items Quality of Nursing Documentation (n = 86) (Cont.)

No	Item	Before Mean ± SD	After Mean ± SD	Mean Difference	CI 95%	p
29	Nursing outcomes criteria related to nursing diagnosis	1.13 ± 0.34	2.13 ± 0.97	1.00	-1.21 – (-0.79)	<0.001*

In **Table 6**, it can be seen that the quality of nursing documentation as a process has several items which actually decreased in the average after training, namely item number 2, 5, 6, 7, 8, and 9, but those items which have a p-value ≤ 0.05 are items number 7 which has a p-value = 0.001. While the quality of nursing documentation as a process experienced an increase in the average number of items 1, 3, 4, 6, 10 and 11, items that experienced an increase in the average and had a p-value ≤0.05 were only on item numbers 3, 4, and 11. Observation items 12-29

regarding the quality of nursing documentation as a product, the quality of nursing intervention documentation and the quality of documentation of nursing outcomes experienced a significant increase which was reflected in a p-value of <0.001.

After the training, the evaluation process of the training consisted of general evaluation, evaluation of sources and evaluation of training materials. Evaluation results can generally be seen in the **Figure 2**.

Figure 2 Evaluation of Training Implementation

In **Figure 2**, the highest score is for the question of whether this training is useful, and the value of 3.19 was reached by the

question of duration, time, ward, and whether the training was interesting.
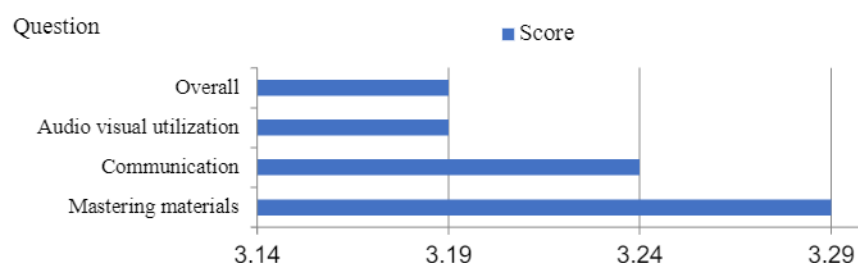
Figure 3 Resource Evaluation

The evaluation on the resource person also has a value above the mean 2, with a minimum value of 3.19 and a maximum value of 3.29. A minimum value of 3.19 was reached by the total and the value of audiovisual usage. The maximum value was reached by

questions about the mastery of the resource material. Thus, the evaluation of the resource person reached a good judgment (**Figure 3**).

DISCUSSION

In this study, there was no significant increase in the quality of nursing documentation as a process. The quality of nursing documentation as a process is the nursing process at the stage of data collection or assessment, interpretation of data grouping data up to the preparation of problems.

After the training interventions, the results of this study indicate a decrease in scores in the quality of nursing documentation as a process, which is in line with the research conducted by Efendy and Purwandari (2012) that found the quality of 100% nursing documentation was in the moderate category, while after the application of NNN there was a decline to medium quality even some in poor quality. Decreasing the quality of documentation as a process is not affected by training interventions. This is possible because training materials are not only focused on assessment but focus on establishing nursing diagnoses, interventions and expected outcomes (Efendy & Purwandari, 2012).

Besides that, no significant increase in the quality of documentation as a process was possible because the assessment was not complete. This study found that there were some parts of the assessment that were often not completed by the nurses. The researcher found the APGAR score section was only filled out on the total score part, and the NIPS or pain scale assessment was also blank, while the assessment of values and beliefs was also often found incomplete or blank. This is in line with the research conducted by Fortney and Steward (2015) on nurse documentation in the final life service in the NICU. The results reflected the lack of pain assessment documentation conducted by nurses, even though the pain scale should be a mandatory scale such as other vital signs. Lack of documentation on this item is possible because of the lack of nurses' understanding of how to measure the pain scale or perhaps because of the responsibilities required to provide care for the babies in the Prenatal ward (Fortney & Steward, 2015). This is also in line with the Nøst et al. (2017) study where a decline in the quality of nursing documentation in the entry/assessment section occurred, although the comparison of pre and post scores was not significant.

Training on the standardization of nursing languages was assessed for improving the quality of nursing care documentation. Training on standardizing nursing languages such as NANDA-I, NIC and NOC can improve the quality of nursing documentation (Efendy & Purwandari, 2012). Nurses can be better able to identify nursing diagnoses and related factors, adopt new ideas and practices when gaining knowledge and develop appropriate attitudes. As a result, nurses are more ready to apply new concepts such as SNL if they are given knowledge and have good understanding (Adubi et al., 2017).

Nursing documentation that is properly and correctly completed requires sufficient intellectual, technical and interpersonal abilities. This capability can be obtained through formal and non-formal education such as in-house training. This formal and non-formal education has a significant influence in providing new ideas, broad ideas, and insights so that nurses can provide examples of behaviors documenting, good nursing care and influencing others to participate in completing documentation correctly. Behavior that is based on good knowledge and understanding will have a more lasting nature and can function to advance the nurse and hospital profession (Chaghari et al., 2017).

This study does not measure the knowledge and attitudes of individual nurses, but many studies have shown that providing training interventions using several learning methods can significantly improve knowledge (Aris, 2014). As in the research conducted by Kaplan and Komurcu (2017) who conducted day training for health workers, it was proven that they could increase knowledge significantly. Besides, other studies related to training to improve the ability to document nursing care, showed that nurses' knowledge in nursing care documentation influences on the implementation of nursing care documentation (Siswanto et al., 2013). In addition to the training above, providing training to nurses regarding the nursing process has been shown to improve nurses' ability to complete nursing care documentation (Linch et al., 2017). This study uses training giving interventions where one of the materials provided is about the nursing process so that by giving the material it is expected to improve nurses' skills in conducting nursing documentation.

One of the results of a systematic review of providing education to patients with diabetes, shows that education in patients does not directly affect knowledge, attitudes, and practices but education is a medium in improving the knowledge, attitudes, and practices of patients in dealing with their diseases (Rav-Marathe et al., 2016). Although systematic reviews were carried out in different populations with this study, information from the results of the systematic review was by the results of this study, where there were significant differences in the quality of nursing care documentation before and after the training. It can be concluded that with a training series intervention which is one form of education for nurses, the training is a media for increasing knowledge, attitudes and practices in the implementation of nursing care documentation.

Knowledge and skills can be improved by intervening through education. Educational intervention has a significant impact on improving the quality of nursing documentation (Nøst et al., 2017). Knowledge and skills in establishing a nursing diagnosis are the main aspects in nursing documentation (Nøst et al., 2017). Nurses will be able to complete nursing documentation well if they can properly establish a nursing diagnosis. Enforcement of a correct nursing diagnosis must be supported by the ability to conduct studies, analyze data and formulate nursing diagnoses (Karaca & Aslan, 2018). The right way to be able to provide an overview of the correct sequence of nursing processes is by case studies and bedside teaching. In line with Nøst et al. (2017) research conducted by providing interventions through education that is proven to be able to improve nurses' abilities in critical thinking related to clinical and thought processes to establish nursing diagnoses that have continuity with assessment, setting goals, interventions and nursing outcomes.

One method of doing education that can be done to improve the quality of documentation is by mentoring. This mentoring technique can be used to build trusting relationships, share the

desire to learn new knowledge and skills. The success of the mentoring process can be measured by evaluations and feedback from the mentoring participants. Such mentoring techniques can encourage participants to actively acquire new skills (Jefferies et al., 2012).

The most important aspects in improving the quality of nursing care documentation are through education and continuous monitoring and evaluation of its implementation (Jefferies et al., 2012; Kamil et al., 2018). The training of this documentation system can improve knowledge/understanding so that it supports better documentation (Lees, 2010). This is in line with the research conducted by Siswanto et al. (2013) that showed the most dominant factors in increasing the completeness of nursing documentation are training and nurse workload.

Providing education to nurses in hospital settings is also effective if done by simulation methods. A study using a meta-analysis of simulation-based nursing education states that simulation-based nursing education is effective in various learning domains. The results of the study conducted by Kim et al. (2016) shows that simulation-based nursing education has a strong educational effect and its greatest effect is on the psychomotor domain, but in this study, it was also found that consistency in applying the acquired knowledge was low (Kim et al., 2016).

Simulation methods have been shown to increase knowledge, confidence and nursing documentation skills. The training process will be considered good if evaluation of the training process is held. This evaluation process for training providers has many benefits such as for quality improvement, including feedback on improving quality and continuing training. The most widely used training evaluation model is the Kirkpatrick's training model. Evaluation models can be in the form of short-term and long-term evaluations. Short-term or level 1 evaluations include evaluating learning reactions and level 2 involves evaluating learning outcomes such as knowledge, attitudes, and skills. Long-term evaluation refers to behavior change and service quality assessment (Grohmann & Kauffeld, 2013).

Training that works well can also be influenced by the characteristics of the trainees. The results of the study showed that the majority of the nurses of the Pioneer Hospital in Yogyakarta Regional Public Hospital who were the subjects of this study had the age of young adults (85.72%). Age at this has high morale and is a generation of learners. Education level that is reached by nurses is mostly diploma in nursing (52.38%) followed by an undergraduate in nursing (42.86%) which provides a good comparison between skilled nurses and expert nurses. The work period by the nurses included a balanced composition with some nurses who have a tenure of more than 10 years (38%) and a work period of fewer than 5 years (33.33%). This composition of nurses is expected to be able to make changes and improvements quickly.

Training can work well if the speaker can communicatively provide good knowledge transfer and share previous experiences. Resource persons were selected from hospitals that have the same characteristics as the Yogyakarta Regional Public Hospital and have work experience in the perinatal ward for more than 10 years. Communicative resource persons were selected and provided material with examples in good implementation. The resource persons are also experts in the preparation of instruction books and modules so that the resource persons provided appropriate materials in line with the contents of the module and training purposes. The process of implementing this training was as stated by Chaghari et al. (2017) that training can provide many benefits if it is implemented in five stages: planning, analysis, design, implementation, and development. Some experts also think that training is good if it uses interesting methods and material, so the most important component in training is the teaching method and how the material is delivered by the resource person which is easily understood and interesting according to its purpose (Chaghari et al., 2017).

Training can work well and must also be supported by the use of media and the right methods. The methods used were lecture and discussion, mentoring how to properly prepare nursing documentation in the perinatal ward, and evaluation of training programs, training also uses power point media, modules, and pocketbooks. This training is expected to increase knowledge and facilitate nurses in learning so that nurses can quickly understand and practice it. This is in line with research conducted by Jefferies et al. (2012) who conducted training on nurses by mentoring how to write nursing documentation in the clinical area with the method proven to improve the quality of nursing documentation. Good communication in nursing documentation can improve patient safety, advance the agendas nursing and other professions and hospitals (Chaghari et al., 2017). The training interventions were demonstrated to be able to improve nurses' ability to complete nursing documentation, even within 3 months after training the average documentation ability was still high (Yeni, 2014). Clinical simulation-based training can create conducive learning conditions and have a significant effect on learning experiences and strengthen nurses' clinical skills (Li, 2016; Sapyta & Eiger, 2017).

CONCLUSION

We demonstrated the positive influence of NANDA-I, NIC and NOC nursing documentation system training on the quality of nursing documentation in the Perinatal ward of Yogyakarta Regional Public Hospital. There was no effect of training on nursing documentation systems on the quality of nursing documentation as a process, but there was positive influence on nursing documentation as a product, nursing intervention documentation, nursing documentation outcomes.

The implications of this study for nursing practice, and future research follow the result of the study which shows that training can be applied to develop nursing documentation in the hospital. Each ward has a different characteristic and the way training was designed will influence the result of training. For future research, the design of the study can be improved using a control group for more accurate results with greater influence of training in improving nursing documentation in the hospital.

ORCID
Enny Eko Setyaningrum https://orcid.org/0000-0002-4137-3335
Intansari Nurjannah https://orcid.org/0000-0002-5406-8727
Anik Rustiyaningsih https://orcid.org/0000-0001-5276-9581

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ORIGINAL RESEARCH

COMPARISON OF TWO TURNING REGIMENS (1 VERSUS EVERY 2 HOURS) IN THE PREVENTION OF CONSTIPATION IN PATIENTS WITH STROKE

Nur Hidayati[1*], Tintin Sukartini[2], Padoli[3]

[1]Medical Surgical Nursing Department, Faculty of Health Science, Universitas Muhammadiyah Lamongan, Indonesia
[2]Faculty of Nursing, Universitas Airlangga, Indonesia
[3]State Health Polytechnic of Surabaya, Indonesia

*Corresponding author:
Nur Hidayati, S.Kep., Ners, M.Kep
Faculty of Health Science, Universitas Muhammadiyah Lamongan, Jl. Raya Plalangan, Plosowahyu KM 02 Lamongan, Indonesia. Fax : 0322-322356
Phone: +6281 332 012 800
Email: deyyacutez@gmail.com

Abstract

Background: Constipation is one of the most common problems in stroke due to inactivity and immobility.

Objective: To compare one hour and every two-hour turning regimens in the prevention of constipation in patients with stroke.

Methods: This was a quasi-experimental research with pretest posttest with control group design. There were 39 participants assigned in intervention group (n=17) and control group (n=22). The intervention group turned every one hour, while control group turned every two hours. The turning regimen was implemented for five days. A bowel score was used to measure constipation. McNemar Test and Fisher Test were used to measure and compare the bowel score between the two groups.

Results: There was no significant difference in the effect of two turning regiments on constipation ($p > .05$). However, based on a descriptive result, there was a slight decrease in the number of constipations from 47% to 29.4% in the intervention group, and from 32% to 27% in the control group.

Conclusion: Turning might still become an effective way to prevent constipation in patients with stroke either every one hour or two hours without diet modification.

KEYWORDS
constipation; stroke; turning

INTRODUCTION

Constipation is one of the most often interference due to inactivity and immobility (Linton, 2012), bed rest and/or immobility (Lemone & Burke, 2011; Potter et al., 2013). Constipation is a change in frequency and volume of defecation and feces consistency caused by the lack of physical activity, the consumption of fibers, liquid intake (Yasmara et al., 2013) and specific medications (Potter et al., 2013). Constipation is not a disease, but a symptom, showed by the decrease of defecation frequency (less than once in 3 days or less than twice in a week), difficulty in feces excretion, excessive straining, inability for defecation when desire for defecation happens, and a hard feces (Potter et al., 2013). The result of a previous study showed that 55.2% of patients with stroke suffered new-onset constipation after 4 weeks of post-stroke, three of them suffered constipation

on the third day of post-stroke. Besides, those who were treated more than 2 weeks suffered more constipation (63%) than the others (28.6%) (Su et al., 2009).

The cause of constipation in patients with stroke is an indirect effect of immobility (Crisp et al., 2013). The prolonged physical inactivity is a relevant cause for functional constipation in healthy people (Lovino et al., 2013). The most possible major cause is an injury in the cortical and medullary nuclei area that affects the function of a sphincter and the modulation of an autonomous nervous system (Camara-Lemarroy et al., 2014). The stroke could cause damage to the central nervous system components, one of them is motor cortex that cause mobility disorder (Crisp et al., 2013). A bad body movement,

intentionally or not, causes the decrease of peristaltic movement of the intestine as a trigger of constipation (Yasmara et al., 2013).

Constipation occurs due to the decrease of colon motility, as a result, it could prolong the feces transit time in the colon and causes most water content in the feces absorbed. Thus, the feces become dry, hard, and difficult to be excreted in the defecation process (Potter et al., 2013; Yasmara et al., 2013). The mobilization and/or activity could stimulate the peristaltic movement, strengthen the abdomen muscle and ease the elimination (Lemone & Burke, 2011). Lovino et al. (2013) recommends that early in-bed turning prevents constipation. Up to date, there is no study examine the effect of in-bed turning on the constipation in patients with stroke. This study aimed to compare the effect of every one-hour and two-hour turning regimen in constipation on the patients with stroke.

METHODS

Study design

This study employed a quasi-experimental design with pretest posttest with control group, which was conducted from January until March 2018 at Neurological Ward of Dr. Ramelan Military Hospital of Surabaya and Jombang General Hospital.

Participants

The target population was patients with stroke in Neurological Ward of Dr. Ramelan Military Hospital of Surabaya with average of 34 patients per month, and Jombang General Hospital with average 172 patients per month. The sample for this study consisted of 49 patients using consecutive sampling technique, which a treatment group (n = 26) was firstly recruited before a control group (n = 23). But there were 9 patients in the treatment group were dropped out from the study due to the use of laxative (7 patients), anti-diarrhea medication (1 patient), and fasting (1 patient) during the study. And 1 patient in the control group was also dropped out due to the use of anti-diarrhea medication during the study. Therefore, the final sample of the study was 39 patients, assigned in the treatment group (n = 17) and control group (n = 22). The inclusion criteria of the sample were: 1) patients with infarct or hemorrhagic stroke, suffered from immobility due to weakness or paralysis, 2) immobility due to bed rest condition like a hemorrhagic stroke at the first 14 days, and 3) having treatment at the first to third day. The exclusion criteria were: 1) patients with the use of laxative or anti-diarrhea in the last three days before the intervention, 2) fasting, and 3) Total Parenteral Nutrition (TPN) intake. The participants would be also dropped from the study if they were out of the treatment, moving to another ward or hospital, passed away, taking a laxative or anti-diarrhea therapy before and during the study.

Instrument

The instrument used to measure the constipation was Bowel Score questionnaire (Yasmara et al., 2013) by calculating and adding the defecation frequency with feces consistency level for the last three days. The constipation was enforced if the score was less than 3. The questionnaire was addressed to the nurses who treated the patients and/ or the family who accompanied the patients in the hospital (**Table 1**).

Table 1 Bowel Score For Constipation Diagnosis

Score	Notes	Result
A	Defecation frequency in the last three days	A=........x/3 days
B	Feces constipation in the last three days 0 = none, 1 = hard, 2 = normal, 3 = soft	B =..........
A+B	Defecation frequency + feces constipation level	Bowel Score = A+B ....+..........=..........

Intervention

The intervention was performed by the researcher assisted by research assistants. The treatment group had a turning regimen every 1 hour in the day time (6 am – 6 pm) (turning to the right side position, in a supination position, and turning to the left side position with a prop of pillow in the back), and every 3 hours in the night time (6 pm – 6 am) (a supination position and turning to the strong side). The control group had a turning regimen every 2 hours in the day time (6 am – 6 pm) (turned to the right side position, a supination position, and the left side position with a prop of pillow in the back), and every 3 hours in the night time (6 pm – 6 am) (a supination position and turning to the strong side). The intervention was performed for five days. Pretest was done before the turning regimen was performed (day 1) and posttest was done after the intervention was completed (day 6) at the same time.

Data analysis

Data were analyzed using SPSS. McNemar Test was used to compare the bowel score before and after the treatment. Fisher Test was used to distinguish the bowel score between two groups (treatment and control) with $\alpha < .05$.

Ethical consideration

The ethical approval of this study was obtained from Dr. Ramelan Military Hospital of Surabaya with approval number of 01/EC/KERS/2018. Prior to data collection, the researchers explained to the patients and their families about advantages, goals, the methods, and rights of the patients to accept or refuse to be a respondent in this study. If they agreed to be a respondent, then they were asked to sign an informed consent form. In this study, all of the forms were signed by patients' families because the patients could not decide by themselves due to the clinical conditions.

RESULTS

Demographic characteristics of participants

The demographic data of participants were described based on the age, gender, and stroke type. The average age of participants in the treatment group was 66 years, with a range of 43-81 years, and the average age of participants in the control group was 67.86 years, with a range of 57-77 years. 58.9% treatment

was performed in the first day, 30.8% in the second day and 10.3% in the third day. The patients with stroke and constipation in the intervention group were 60% of males and 40% of females, and in the control group were 50% of males and 50% females. In the intervention group, 80% of participants were more than or equal to 60 years old and 20% less than 60 years old, while 100% of participants in the control group were more than 60 years old. The patients with a hemorrhagic stroke and constipation were 20% in the intervention group and 16.7% in the control group, while the patients with an infarct stroke with constipation was 80% in the intervention group and 83.3% in the control group. This indicated that the patients with a stroke and constipation were dominated by the patients with infarct stroke compared to the hemorrhagic stroke.

Difference in constipation before and after turning for 5 days in the intervention and control group
The results of McNemar test showed that the bowel score of pretest and posttest in the intervention group obtained p-value of 0.375 (p > 0.05) (**Table 2**), which indicated that there was no statistical difference in bowel score before and after turning every one hour for five days in the intervention group. However, the results of descriptive statistics showed that there was a decrease of constipation from 47% to 29.4%. The patients with stroke who initially suffered from constipation and then healed were 4/8 (50%), and the patients with stroke who initially did

not have constipation and then suffered from constipation were 1/9 (11.1%). The patients with stroke who initially did not have constipation and did not suffer from constipation after five days were 8/9 (88.9%), and the patients with stroke who suffered from constipation before and after intervention were 4/8 (50%). Thus, it could be concluded that the turning regimen every one hour could cope with constipation as many as 50% and could prevent it as many as 88.9%.

In the control group, the result of McNemar test showed that the bowel score of pretest and posttest obtained p-value of 1.000 (>0.05) (**Table 2**), which indicated that there was no statistical difference in bowel score before and after turning every two hours for five days. However, based on descriptive results, there was a decrease of constipation from 32% to 27% in control group. The patients with stroke who initially suffered from constipation and then healed was 6/7 (85.7%), and those who initially did not have constipation and suffered from constipation afterwards was 5/15 (33.3%). The patients with stroke who initially did not have constipation nor suffered from constipation after five days was 10/15 (66.7%), and those who suffered from constipation before and after treatment was 1/7 (14.3%). In conclusion, the turning regimen every two hours could cope with constipation as many as 85.7% and could prevent it as many as 66.7%.

Table 2 Difference in Constipation (pretest and posttest) in the Intervention Group (n = 17) and Control Group (n = 22)

| Group | Bowel score | | | | n | p |
| | Pretest | | Posttest | | | |
	Constipation	No constipation	Constipation	No constipation		
Intervention	0	9	1	8	9	.375
	8	0	4	4	8	
	Total				17	
Control	0	15	5	10	15	>.999
	7	0	1	6	7	
	Total				22	

Constipation (score ≤3), no constipation (score >3)

Difference in the effect of two turning regimens for 5 days on constipation

Table 3 Difference in the effect of two turning regimens on constipation (N=39)

| | Bowel score (posttest) | | | | p (Fisher's exact test) |
| | No Constipation | | Constipation | | |
	n	%	n	%	
Intervention	12	42.9	5	45.5	> .999
Control	16	57.1	6	54.5	
Total	28	100	10	100	

The result of Fisher's Exact test between two groups showed p-value of 1.000 (>0.05), which indicated that there was no statistical difference between the intervention and control group (**Table 3**). The turning regimen either every one hour or two hours could prevent the constipation in the patients with stroke and immobility.

DISCUSSIONS

The result of this study showed that there was no statistical difference in the constipation occurrence between two turning regimen groups. It indicates that the need for defecation for patients with stroke was still fulfilled, which was treated with turning position every one hour or two hours. However, findings also showed that 11 patients still had constipation in both treatment group (27.8%) and control group (27.3%), which indicated that the prevention of constipation was not enough if only performed by turning. That could be another reason or factor to understand this condition.

According to literature, the other factors that may influence the incidence of constipation such as age, duration of immobility, type of stroke, turning time, and type of diet, which could be explained for our study.

Age. The characteristics of respondents were dominated by age group of ≥ 60 years in both treatment group (70.6%) and the control group (86.4%). The results of the bowel score after 5 days of turning showed that 5 patients in treatment group (4 patients aged ≥ 60 years and 1 patient aged <60 years), and 6 patients (aged ≥ 60 years) in control group still had constipation. There was a controversy of evidence related to the effect of age on changes in colon motility and myoelectric activity, which affected the incidence of constipation. The evidence showed that there is a normal function of defecation in most healthy elderly (Gallagher & O'mahony, 2009). However, the basic pathophysiology of intestine motility change is still unknown (Camara-Lemarroy et al., 2014). In general, constipation in the elderly can be caused by two things, namely primary (idiopathic or functional) or secondary (iatrogenic or caused by concomitant diseases) (Gallagher & O'mahony, 2009).

Duration of immobility. The incidence of constipation on day 1-3 of hospitalisation was 47.1% for the treatment group and 31.8% for the control group. The previous studies showed that the incidence of constipation in patients with stroke between 30-60% occurred after 4 weeks post stroke, 3 patients experienced on the third day post stroke (Su et al., 2009). This was probably caused by the duration of immobility in patients with stroke due to paralysis and or altered level of consciousness. The results showed that immobility for a long time could cause functional constipation in normal humans (Iovino et al., 2013), but it had not been studied in stroke. The immobility causes a decrease in the colon motility due to the lack of High Amplitude Propagated Contraction (HAPCs) in the colon. The reduction in the colon motility could prolong the feces transit time in the colon and lead to a reabsorption of the water content of the feces mass so that the feces become dry, hard, and difficult to be excreted in the defecation process (Potter et al., 2013; Yasmara et al., 2013).

Type of stroke. Posttest results showed that more constipation occurred in ischemic strokes, (23.5% in the treatment group and 22.7% in the control group) compared with hemorrhagic strokes (2.56% in the treatment group and 2.56% in the control group). However, there are no research results that could explain the effect of the type of stroke on the incidence of constipation.

Turning time. Turning was carried out in the first 24-72 hours after admission (day 1 = 58.9%; day 2 = 30.8%; day 3 = 10.3%) for 5 days. Early mobilization in bed with turning was recommended for bedridden patients to prevent constipation (Iovino et al., 2013) because mobility or activity could stimulate the peristaltic movement, strengthen the abdominal muscle, and ease the elimination (Lemone & Burke, 2011). However, there is no specific recommendation for an approriate interval or time of turning to prevent constipation in patients with stroke. However, literature is more likely to reveal that turning to the right and left every two hours could increase the peristaltic movement and rectal toucher in the patients with infarct stroke (Prastya (2013).

Diet. Diet modification combined with pharmacological therapy as laxative is common therapy given to deal with constipation in the elderly who suffer from stroke. The study showed that high fiber diet could not prevent or overcome constipation completely because it only forms feces without increasing the peristaltic movement of the intestine (Sturtzel & Elmadfa, 2008). In our study, the diet type undertaken by the patients in the hospital was different and it could not be controlled due to the difference in the various clinical condition of every patient. For instance, some respondents were given a liquid diet without milk and/or with milk due to the use of NGT, while some others were given per oral diets such as smooth porridge, thick porridge, rice porridge, and rice without considering the fiber intake. These differences could affect the feces consistency and the result of bowel score measurement.

The implication of our study was that the turning regimen every 1 hour or 2 hours could be performed as early as possible to prevent or overcome constipation in patients with stroke who experienced immobilization due to paralysis and/or altered level of consciousness before providing pharmacological therapy.

Limitations of the study
The type of diet of the patients could not be uniformed. The diet type was given to the patients was suited to the consciousness level and the clinical condition so that it could affect the feces consistency and the result of bowel score measurement. Moreover, the sample criteria could not be homogenized before the treatment based on the bowel score due to limited samples. The overall number of samples in this study was small and the sampling technique was non-random. Thus, it is less strong for generalization to the population. In addition, the researchers did not compare with participants that had never been turned due to ethical consideration. Moreover, tools used to measure bowel score was subjective. Consequently, the bowel posttest score could not be clearly identified whether it was influenced by turning or other factors.

CONCLUSION

The turning regimen either every one hour or two hours could prevent and overcome constipation in the patients with stroke without diet modification. However, there is a need to perform a further study with bigger samples size and with more accurate tools, and RCT design to have a stronger result for generalization to the population.

Authors Contributions
NH: collected data, and drafted the article. TS: The 1st academic advisor who gave correction in the article especially in methods including

statistical test and procedure of data collection. PP: The 2nd academic advisor who analyzed and drafted the article.

ORCID
Nur Hidayati https://orcid.org/0000-0002-2891-0589
Tintin Sukartini https://orcid.org/0000-0003-3869-7897
Padoli https://orcid.org/0000-0001-8156-0437

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ORIGINAL RESEARCH

THE RISK OF SMARTPHONE ADDICTION TO EMOTIONAL MENTAL DISORDERS AMONG JUNIOR HIGH SCHOOL STUDENTS

Rizky Setiadi[*]**, Tini, Edi Sukamto, Umi Kalsum**

Ministry of Health, Health Polytechnic of East Kalimantan, Indonesia

*Corresponding author:
Ns. Rizky Setiadi, S. Kep., MKM
Ministry of Health, Health Polytechnic of East Kalimantan
Poltekkes Kemenkes Kalimantan Timur
Jl. W. Monginsidi No 38. Samarinda 75123
Cell: 08125525253
Email: r12ky_ui@yahoo.com

Abstract
Background: The use of smartphones increases in Indonesia, its users are no longer among adults but have also spread to teenagers and children. Smartphone addiction causes a variety of problems, both physical, social, behavioral, and psychological problems of adolescents.
Objective: The objective of this study is to identify the association between the tendency of smartphone addiction and the occurrence of emotional mental disorders in adolescents of junior high school students in Samarinda.
Methods: This study used a descriptive analytic design through cross-sectional approach conducted in junior high schools in Samarinda. Sample of this study were 127 students. The 20 self-questionnaire adopted from the 2013 Basic Health Research questionnaire was used to measure emotional mental disorders, and the Smartphone Addiction Scale - Short Version (*SAS-SV*) questionnaire was used to measure smartphone addiction. Data were analyzed with multiple logistic regressions.
Results: Results showed that there was an association between smartphone addiction and emotional mental disorders among junior high school students in Samarinda ($p < .05$). Adjusted Odds Ratio (*AOR*) was obtained at 2.418 (95% *CI* was 1.033 – 5.660).
Conclusions: Smartphone addiction may lead emotional mental disorder among Junior High School students. The decisive rules are needed in the use of smartphones, both at school and at home to prevent the occurrence of smartphone addiction.

KEYWORDS
smartphone addiction; emotional mental disorders; adolescence; mental health

INTRODUCTION

Based on the 2010 Population Census data, the population of Indonesia is 237.6 million, with the number of adolescents aged 10-24 years is very large, which is around 64 million or 27.6% (Badan Pusat Statistik, 2010). The large number of teenagers makes it a potential object to become a "commodity" for business people, including the smartphone business.

The use of smartphones in adolescents has a positive impact because it provides convenience and flexibility for teenagers to get useful information (Sarwar & Soomro, 2013). In addition, the use of smartphones has become a trend in the lifestyle of adolescents. Almost all teenagers already have smartphones, there is even a tendency to feel embarrassed and insecure if they do not have it (Anderson & Jiang, 2018).

According to data from the Indonesian Ministry of Research, Technology and Higher Education, smartphone users in Indonesia are more than 25% of Indonesian people or around 65 million people (Kemenristekdikti, 2017), this is in line with a survey conducted by the Indonesian Internet Service Providers Association which mentions that internet users in the age range of 10-15 years are 768 thousand and the age range of 15-19 years is 12.5 million. The most accessed internet content by users is 97.7% of social media or 129.2 million users, 96.8% of entertainment or 128.4 million users, and 96.4% of news or as much as 127.9% million users. The most social media that is accessed by users is Facebook at 71.6 million users (54%), Instagram 19.9 million users, and YouTube 14.5 million users (Asosiasi Penyelenggara Jasa Internet Indonesia, 2016). Whereas according to Soliha (2015) the average social media user among students has 5 active

accounts, with the largest percentage being Blackberry Messenger (BBM) of 53% and Facebook of 34% of users who mostly use smartphones (77%) or as many as 77 people out of 100 respondents.

The use of smartphones among adolescents can also have a negative impact, because the information received may not prove the truth (Anderson & Rainie, 2017). Lack of control from parents causes many teens to abuse smartphones to access content that can adversely affect adolescent behavior, such as violent behavior and pornography (Lee & Ogbolu, 2018). In addition to guidance and control from parents, it is also necessary to control teenagers themselves to prevent adolescents from using smartphones excessively which can add to the effects of addiction (Lee & Ogbolu, 2018).

Teens are more likely to spend time with smartphones than interacting with friends and family (Knudsen, 2017). Smartphone addiction causes a variety of teen problems, both physical, social, behavioral, and psychological problems of adolescents. Some problems that can arise due to uncontrolled use of smartphones, such as impaired vision, impaired hearing, impaired sleep quality (Hidayat & Mustikasari., 2014; Mohammadbeigi et al., 2016), reduce empathy (Prasetyo, 2017), depression problems in adolescents (Dewiratri & Karini, 2014), self-esteem and social support problems (Choi & Yoo, 2015), and emotional mental disorders (Gowthami & Kumar, 2016; Putri et al., 2017; Sarwar & Soomro, 2013).

Emotional mental disorder is a state of emotional change that if left unchecked can develop into a pathological state (Kemenkes Ri, 2013b). Another term is psychological distress characterized by changes in thinking, behavior or mood that can be caused due to pressure and disruption of function for a certain period of time (Kemenkes Ri, 2013b). Based on Basic Health Research Report in Indonesia (Kemenkes Ri, 2013b), the prevalence of emotional mental disorders that occurred at the age of 15 years and over decreased compared to the prevalence that occurred in 2007. The prevalence in 2007 was 11.6%, down to 6% or 37,728 people in 2013. Prevalence in urban areas is greater than in rural areas. The highest prevalence rate in Central Sulawesi province is 11.6% and the lowest in Lampung is 1.2%. While in East Kalimantan province the prevalence of emotional mental disorders is 3.2%.

Excessive smartphone use can increase the risk of adolescent, physical and mental health problems. The aim of this study was to identify the association between the tendency of smartphone addiction and the occurrence of emotional mental disorders in adolescents of junior high school students in Samarinda.

METHODS

Study Design
This study used a descriptive analytic design through cross-sectional approach.

Sample
There were 127 junior high school students in the city of Samarinda who were selected by the cluster random sampling method. Primary sampling unit was junior high school in Samarinda that was randomly selected. Selected junior high schools cannot be mentioned by researchers to guarantee confidentiality. There were no inclusion criteria in this research, every student had a same chance to be selected as a respondent. The number of samples was calculated using "Statistics and Sample Size" version 5, an android software developed by Truc (2016), which is to compare two proportions, with level of confidence of 95% and power of 80% - P1 (.427) and P2 (.227) were based on a previous study (Asif & Rahmadi, 2017). To avoid sampling error, correction for continuity was used.

Instrument
Dependent variable, which is emotional mental disorder was measured by the 20 self-questionnaire adopted from the 2013 Basic Health Research questionnaire. It consisted of 20 item questions with the answer choices in the form of yes and no using the Guttmann scale. The cut-off point set in this study is 6, meaning that if the respondent answers at least 6 or more "yes" answers, then the respondent is indicated to suffering an emotional mental disorder. Data collected using the SRQ instrument has limitations only revealing the emotional status of individuals for a moment ($\pm$ 30 days) and is not designed to diagnose mental disorders specifically (Kemenkes Ri, 2013a).

To measure the trend of smartphone addiction tendency, the Smartphone Addiction Scale - Short Version (SAS-SV) questionnaire was used which has analyzed its validity and reliability, where 10 valid statement items were obtained. The responses were originally coded on a five-point Likert-type scale ranging from 'strongly agree' (=5) to 'strongly disagree' (=1), which were combined to create a single index. Cronbach's alpha value is .911 (Kwon et al., 2013).

Data Collection
This research was conducted in Junior High School students in Samarinda on August to November 2018. After permission from the school was obtained, the researchers then came to the school and collected data. Students who were eligible to become respondents were collected in one room. Before a questionnaire was distributed, an explanation of the research procedures and objectives was conducted. Each respondent took the questionnaire and an informed consent to their home to get their parents' permit and signature. Once the consent has been signed, the students were then asked to fill out the questionnaire, and brought it back to the researchers in the day after.

Data Analysis
Data analysis were carried out using a computer program of Statistical Package for the Social Sciences (SPSS) version 2. A multivariate analysis was used to identify risk of smartphone addiction to emotional mental disorders was multiple logistic regressions.

Ethical Considerations
Research ethical behavior is followed throughout the duration research. Initially, written permission to conduct research secured from the appropriate headmaster of the schools. Written informed consent was then obtained from participants as a manifestation of

their voluntary involvement in research. Full study disclosures are given and participants are guaranteed confidentiality and anonymity. This research has been approved by the Polytechnic of Health Ministry of Health East Borneo Ethics Committee through a decree number LB.02.01/7.1/5621/2018.

RESULTS

The characteristics of junior high school students can be seen on this following table:

Table 1 Characteristics of Junior High School Students in Samarinda 2018

Characteristics	Frequency (F)	Percentage (%)
Age		
11 years old	3	2.4
12 years old	37	29.1
13 years old	43	33.9
14 years old	32	25.2
15 years old	11	8.7
16 years old	1	0.8
Sex		
Male	66	52
Female	61	48
Father's Education Level		
Basic Level	13	10.2
Senior High School	57	44.9
High School	57	44.9
Father's Occupation		
Do not have job	5	3.9
Government Employee	25	19.7
Private Employee	51	40.2
Entrepreneur	36	28.3
Retired	6	4.7
Others	4	3.1
Mother's Education Level		
Basic Level	12	9.4
Senior High School	61	48
High School	54	42.5
Mother's Occupation		
Housewife	74	58.3
Government Employee	20	15.7
Private Employee	13	10.2
Entrepreneur	16	12.6
Retired	2	1.6
Others	2	1.6
Have a Smartphone		
Yes	126	99.2
No	1	0.8
Smartphone Use		
Call and Short Message Service	3	2.4
Accessing Lessons	15	11.8
Social Media and Messenger	71	55.9
Online Music	3	2.4
Watching Movie Online	7	5.5
Playing Game Online	28	22
Daily Smartphone Use		
Less than 1 hour	16	12.6
1 – 2 hours	42	33.1
More than 2 to 3 hours	19	15
More than 3 hours	50	39.4
Total	**127**	**100**

Table 1 showing the highest age of students was 13 years as much as 43 people (33.9%) and as many as 66 students are male or by 52%. At the father's education level, only 13 people had basic education (elementary and junior high school), while the mother's education level still had 12 mothers with basic education (elementary and junior high school). Based on the occupation of parents, it was found that the majority worked as private employees, namely as many as 51 people (40.2%), while the majority of mothers worked as housewives, namely 74 people (58.3%). Almost all students have their own smartphones, only 1 student does not have a smartphone.

The highest number of smartphone use is used to access social media and messenger as many as 71 students (55.9%) and only 3 students use it to make phone call or Short Message Service and listen to music online. The average time to use a smartphone in a day for the last week was more than 3 hours with 50 students (39.4%) and those using smartphones less than 1 hour as many as 16 students or 12.6%.

Figures for the tendency of students who experience smartphone addiction and emotional mental disorders can be seen in the following table:

Table 2 Trend of Smartphone Addiction and Emotional Mental Disorders of Junior High School Students in Samarinda 2018

Variables	Frequency (F)	Percentage (%)
Smartphone Addiction		
Addicted	60	47.2
Not Addicted	67	52.8
Emotional Mental Disorders		
Yes	49	38.6
No	78	61.4
Total	**127**	**100**

Based on **Table 2**, there were 60 students or 47.2% who experienced a tendency towards smartphone addiction, and as many as 76 students who did not experience the tendency of smartphone addiction or 52.8%. There were 49 students or 38.6%

who experienced emotional mental disorders, and as many as 78 students who did not experience emotional mental disorders or equal to 61.4%.

Table 3 Final Model of Multiple Logistic Regression

Variables	B	p value	Adj. OR
Tendency of Smartphone Addiction			
Addicted	0.883	0.042*	2.418
Not Addicted			(1.033-5.660)
Sex			
Male	1.315	0.003*	
Female			
Rule in School			
No smartphone use restriction	1.546	0.001*	
Smartphone use restriction			
Average time of Smartphone Use	-0.005	0.007*	

The association risk of smartphone addiction to emotional mental disorders adjusted with sex, rule in school, and average time of smartphone use were statistically significant (p value: 0.042). The ORs with analyzed by their 95% CIs were estimated by logistic regression models. Adjusted OR and 95% confidence interval is 2.418 (95% CI: 1.033-5.660), which mean that students who tend to be addicted to smartphone have an odds of 2.418 times greater for emotional mental disorders than students who have no tendency to be addicted to smartphone, adjusted by sex, rule in school, and average time of smartphone use.

DISCUSSIONS

From the data collected from the study, it was found that almost every junior high school student in Samarinda had their own

smartphone. This is in line with survey data conducted by the Indonesian Internet Service Providers Association (IISPA) which states that in 2017 internet users in Indonesia reached 143.26 million, and the third highest users are adolescents aged 13-18 years old which is 16.68%. This percentage looks tiny, but on the same survey it turns out that the penetration of internet users in the age range of 13-18 years old is the highest, which is equal to 75.50%. The largest percentage device to access the internet was smartphones, which is 44.16% ([Asosiasi Penyelenggara Jasa Internet Indonesia, 2017](#)).

The high number of smartphone users among teenagers provides a great opportunity for an increase in smartphone addiction. Addiction to smartphone use can also be termed nomophobia or feel anxious if the smartphone is not nearby. It was found that the average smartphone use addiction in adolescents was 48.8 which

was in the high category (Hidayat & Mustikasari., 2014). This is also in line with the research conducted by Agusta (2016) in senior high school students in Jogjakarta who stated that the prevalence of smartphone addiction was 42%. In addition, the results of the study (Asif & Rahmadi, 2017) showed that 52% of adolescents aged 11-12 years were highly addicted.

Based on the study, it was found that the incidence of emotional mental disorders in junior high school students in Samarinda was 38.6%. This is quite high and quite alarming among teenagers, because teenagers are the future of the progress of the Indonesian nation. In Indonesia, people with emotional mental disorders are 6% at the age of 15 years and above (Kemenkes Ri, 2013b). If this emotional mental disorder is not immediately addressed, it can cause severe mental disorders. Teenagers who are healthy both physically and psychologically are very valuable capital for the progress of the nation in the future. Unhealthy teens can be a burden for future health financing (Kutcher, 2017).

Some risk factors related to emotional mental disorders include: sex, abuse, comfort in school, consumption of alcohol and drugs, chronic illness, and level of education (Idaiani et al., 2015; Mubasyiroh et al., 2017; Utina, 2012; Widakdo & Besral., 2013). In addition to the risk factors mentioned above, emotional mental disorders may be influenced by the use of smartphones with excessive internet access, such as the use of social media and games online (Al-Ayouby, 2017; Asif & Rahmadi, 2017; Cahyono, 2016; Kim, 2017; Kusuma, 2014; Nurina & Alyu, 2017)

Based on the study, it was found that there was a relationship between the tendency of smartphone addiction and emotional mental disorders in junior high school students in Samarinda. Teenagers use smartphones more likely to accessing social media and messenger than to accessing information that is useful for school lessons. They can spend hours accessing social media and communicating via messenger which can have an impact on their psychosocial status. Some studies show that the level of adolescent addiction to smartphone use can have a negative impact both physically, psychologically and behavior, including impaired of vision, hearing, sleep quality, decreased empathy, depression problems in adolescents, self-esteem problems and social support and emotional mental problems (Al-Ayouby, 2017; Budhyati Mz, 2012; Choi & Yoo, 2015; De-Sola Gutiérrez et al., 2016; Gowthami & Kumar, 2016; Hidayat & Mustikasari., 2014; Mohammadbeigi et al., 2016; Prasetyo, 2017).

This is in line with several previous studies related to the impact of using smartphones and excessive social media. Some of the results of previous studies stated that excessive smartphone use can affect the work of the brain and thus tend to experience psychosocial disorders (Gowthami & Kumar, 2016). In addition, excessive smartphone use can also influence behavior in socializing and decreasing empathy in adolescents (Al-Ayouby, 2017; Nurina & Alyu, 2017; Prasetyo, 2017).

The high rate of addiction to smartphones in adolescents is caused by a change in the way they communicate with, the use of technology through social media which gives more freedom to adolescents in exploring their feelings, opinions and perspectives (Thompson, 2013). In addition, there is a fear of to be out of date if it does not have social media, and fear that important information will be left behind through social media and messenger applications, so that teenagers tend to always access social media and messaging (Thompson, 2013). This can be seen in the highest smartphone usage, namely to access social media and messenger, which is equal to 55.9% in adolescent junior high school students in Samarinda.

Emotional mental disorders are very detrimental because if they are not dealt with properly and quickly, they may cause adolescents to fall into a state of severe mental disorder (World Health Organization). This has an impact on the productivity of adolescents in carrying out their roles. In addition, severe mental disorders are very difficult to cure, so they can increase health financing and become a significant burden for the country.

Many previous studies have found the effects of smartphones addiction for health problems, but research on mental emotional disorders is still minimal, especially in Indonesia. With these findings, it is expected to provide information and knowledge, both to nurses as health workers and to the public in general, specifically related to the dangers of smartphone use to adolescent mental health. Although it was realized that there were still limitations to this study if viewed from the use of instruments that did not specifically measure the incidence of mental emotional disorders in adolescents. The conduct of research in schools can also provide the possibility of information bias.

CONCLUSION

Most teenagers use smartphones to access social media and messenger with an average time of using a smartphone more than 3 hours to accessing social media and messenger. 47.2% of students experience a tendency towards smartphone addiction. Teenagers who experience emotional mental disorders are 49 students or 38.6%. There is a relationship between smartphone addiction tendencies with emotional mental disorders. For further research, it can be developed in applied research to try out some complementary therapies that can be used to rehabilitate smartphone addiction, so that mental emotional disorders in adolescents can be prevented.

Authors Contribution

All authors have contributed from conception to the finalization of this study. Most of the significant intellectual content of this publishable copy of the article was done by the corresponding author. **RS** contributed in planning research, collecting data, analyzing data, and compiling manuscripts. **TT** contributed in helping with research planning, collecting data, and providing suggestion for the manuscript. **ES** contributed to planning preparation and reviewing the content of mental emotional. **UK** contributed in giving related advice about adolescents and their development, and help in publications process.

ORCID

Rizky Setiadi https://orcid.org/0000-0001-6360-4635

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ORIGINAL RESEARCH

DIFFERENCE OF BOWEL SOUND RETURN TIME AMONG POST-LAPARATOMY SURGERY PATIENTS AFTER CHEWING GUM

Warisya Miftah Amanda[*], Chandra Isabella H.P, Ristina Mirwanti

Faculty of Nursing, Universitas
Padjadjaran, Indonesia

*Corresponding author:
Warisya Miftah Amanda, S.Kep
Faculty of Nursing Universitas Padjadjaran
Jl Raya Bandung – Sumedang Km. 21,
Sumedang 45363 Jawa Barat, Indonesia
Telephone and fax number: +6222-7795596
Email: warisyamiftah@gmail.com

Abstract

Background: A surgical procedure using general anaesthesia in laparotomy surgery results in reduced bowel sound. A large number of patients who experience a delay in returning bowel sound after laparotomy surgery become the reason to give proper intervention in order to increase bowel sound return time. One of the non-pharmacological interventions that can be used is chewing gum.

Objective: The purpose of this study is to identify the difference of bowel sound return time between groups of intervention and control after being given chewing gum intervention among post-laparotomy surgery patients.

Methods: This quasi-experimental study used post-test only control group design. Thirty respondents were selected by purposive sampling technique. Data were collected through observation by calculating the bowel sound return time among post laparotomy surgery patients in the intervention group (n=15) and control group (n=15), and were analyzed using the Mann Whitney test. The intervention group was asked to chew the gum once for 30 minutes, and bowel sound was measured every 30 minutes for 120 minutes.

Results: The results showed that bowel sound return time in the intervention group was 90 minutes and the control group was 150 minutes, and p-value was 0.005.

Conclusion: There was a difference in the return time of bowel sound between the intervention and control groups. Therefore, the intervention of chewing gum could become one of the non- pharmacological interventions that can be considered in increasing the bowel sound return time among post-laparotomy surgery patients.

KEYWORDS
bowel sound; chewing gum; laparotomy; post surgery

INTRODUCTION

Surgery is defined as a medical treatment performed by surgeons using an invasive method by opening the body part to be treated. This surgery causes physical and psychological stress to the patient because it is a complex event associated with life-threatening actions so that it will cause tense feelings in the patients themselves (Sjamsuhidajat & Wim, 2010).

One of the major surgeries that are mostly done is laparotomy. Laparotomy is a surgical technique that is performed by making an incision in the abdomen. Laparotomy is usually performed in cases of digestive and obstetric surgery (Sjamsuhidajat & Wim, 2010). At Royal Sussex Country Hospital (RSCH), it was noted that there are around 850 laparotomy surgical procedures carried

out from 2009 to 2010 (Shapter et al., 2012). The longer the return of bowel noise of the patients after laparotomy surgery will increase the accumulation of secretions and gases which can cause discomfort and risk of complications in patients (Ge et al., 2015). The most frequent discomfort felt by patients is abdominal distension, abdominal pain, nausea, and vomiting (Atkinson et al., 2016).

In addition to the discomfort felt by patients, there are many risks of complications that can occur if no immediate intervention is carried out to speed up the recovery of bowel sound after laparotomy surgery. The risks of such complications are such as the late discharge of flatus or faeces, late mobilization, delay in

getting oral nutrition, delayed wound healing, high risk of adhesion, high risk of nosocomial infections, high risk of lung complications, and high risk of postoperative ileus. Postoperative ileus is the most common complication, and it endangers post-laparotomy surgery patients. Patients can be said to experience postoperative ileus if the intestinal peristalsis does not improve until the third to fifth day after surgery (Bashankaev et al., 2009). Patients who experience postoperative ileus are mostly post-abdominal surgery patients, especially in the lower area (Sjamsuhidajat & Wim, 2010). According to Vather et al. (2013), it was noted that around 10% - 25% of patients after major abdominal surgery experience postoperative ileus problem.

As a result of these conditions, the period of in-patient care in the hospital can be longer so that the costs incurred by the patient and family also will be higher during the treatment process (Atkinson et al., 2016). According to Iyer et al. (2009), on average, in the United States, post-laparotomy surgery patients with postoperative ileus have to undergo hospital treatment for a total of 13.8 days.

Laparotomy is one of the major types of surgery that uses anaesthesia as a pain-relieving procedure during the surgery. The effect of giving anaesthetic is reducing the work of intestinal peristalsis so that when a physical examination of a postoperative patient is obtained, there will be weak bowel sound in the four abdominal quadrants. Post-surgery patients can be deemed as improved if there is an increase in bowel sound or intestinal peristalsis. Therefore, the patient's intestinal peristalsis after laparotomy surgery must return as soon as possible to prevent postoperative ileus complications that will endanger the patients themselves (Sjamsuhidajat & Wim, 2010).

The high number of post-surgery complications and deaths causes surgical action to be a concern for global health. Many medical interventions can be performed on patients after laparotomy surgery to accelerate the return of bowel sounds and prevent the occurrence of postoperative ileus complications, such as using prokinetic drugs which function is to make the muscle of the digestive organs return as quickly as possible so that patients can immediately eat orally (Barletta & Senagore, 2014). Many previous studies related to other non-pharmacological interventions that are more precise and safe to accelerate the return of bowel sound and prevent postoperative ileus complications in post-laparotomy surgery patients, such as early oral hydration, early mobilization techniques, and chewing gum (De Almeida et al., 2017; Liu et al., 2017; Tazegül Pekin et al., 2015). One of non-pharmacological interventions that can be used to make intestinal peristalsis of patients return quickly is early oral hydration. However, because of the condition of post-surgery patients who still often feel nauseous, sometimes accompanied by vomiting and discomfort in the stomach, other methods to restore the patients' digestive function under normal conditions as soon as possible are needed (Liu et al., 2017).

In addition to early oral hydration, the early mobilization technique is also one of the post-surgery recovery programs that aim to prevent the occurrence of post-surgery complications (Kehlet, 2008). In addition, post-laparotomy surgery patients are encouraged to do early mobilization to improve blood circulation and restore physiological function so that the patient's recovery time will be faster (Castelino et al., 2016). Based on research by De Almeida et al. (2017), from 108 post-abdominal cancer surgery respondents who received early mobilization interventions twice a day with nurse assistance, the results showed that the recovery time of patients was much faster than respondents who did not receive intervention. This was evidenced by the existence of patients who had been able to carry out daily activities independently without assistance on the fifth day after surgery.

Seeing the high rate of laparotomy surgery and the late occurrence of returning bowel sound in patients after laparotomy surgery, thus it is felt that the best intervention in accelerating the return of bowel sound in post-surgery patients to prevent complications of postoperative ileus is needed. The intervention is in the form of suggestion to chew gum after surgery.

Chewing gum is the same as the sham feeding technique, which is when the food given orally is not really digested by digestion, because in this technique the patient is usually only told just to smell, taste, and chew food and then spit it out (Liu et al., 2017). Chewing gum can increase intestinal peristalsis by activating the cephalic-vagal pathway which will stimulate myoelectric intestinal activity and will counteract the effects of gastrointestinal opioid receptors, so the nervous system and hormones in the digestive tract will return to work (Fanning & Valea, 2011). Chewing gum is a cheap and safe method to restore intestinal peristalsis or bowel sound of post- laparotomy surgery patients immediately. If bowel sound can return quickly, postoperative ileus complications will not occur in patients (Berghmans et al., 2012). Based on the results of the study of De Castro et al. (2008), chewing gum after surgical abdominal colectomy can improve the patient's intestinal peristalsis and prevent the occurrence of postoperative ileus complications. Ledari et al. (2013) reported in his study that patients after cesarean section surgery who were given gum-chewing intervention experienced flatulence and increased intestinal peristalsis.

Unlike early mobilization interventions, chewing gum is still rarely used as an alternative intervention to accelerate the recovery of intestinal peristalsis and prevent complications of patients after laparotomy abdominal surgery. Based on the research of Terzioglu et al. (2013), the bowel sound in post-laparotomy surgery patients who were given early oral hydration intervention, early mobilization and chewing gum, patients would have a bowel sound return time around 2.5 hours to 9.5 hours after the implementation of the intervention. The weakness in this study was that there were too many non-pharmacological interventions applied to the post-laparotomy surgery patients.

Based on the results of these studies, it is necessary to do further research related to the effect of chewing gum on the difference of bowel sound return time in post-laparotomy surgery patients who are given gum-chewing interventions plus early mobilization and the post-laparotomy surgery patients that are only given early mobilization intervention.

All patients in this study will receive early mobilization intervention according to the standard operating procedures in the ward. Patients will get the same type of mobilization, which is left tilted and right tilted and in the same duration of time, which is 30 minutes. This early mobilization intervention was given in conjunction with the gum-chewing intervention in the intervention group. However, there are several studies that stated that the method of chewing gum does not have a significant effect in accelerating the return of bowel sound in post-laparotomy surgery patients. After an analysis was conducted to some of these studies, it was concluded that there were several factors that influenced the final results of research such as research principles, number of respondents, types of gum given, types of anaesthesia used, giving other interventions besides chewing gum, power research, and errors in making hypotheses (Ge et al., 2015).

Based on the previous research, it can be seen that there were significant differences in the final results of the implementation of gum chewing interventions, which can accelerate the return of bowel sound in post-laparotomy surgery patients. Therefore, in this study, researchers need to consider related factors that can influence the final results of the chewing gum intervention, so that later it can be seen whether the gum-chewing intervention has an influence on the return time of bowel sound of post-laparotomy surgery patients.

Nurses have an important role in providing the appropriate interventions to post-laparotomy surgery patients so that they can prevent post-surgery problems early, such as complications that will cause further harm to patients and families. One of the initial interventions that can be applied in restoring a patient's condition after a laparotomy surgery is to advise the patient to chew gum, which can improve the return time of bowel sound. Education and supervision in the provision of interventions are important tasks for nurses to do, such as giving directions regarding the duration and frequency of chewing, monitoring the level of patient's compliance when chewing, and seeing if there are problems during the chewing process. The objective of this study is to identify the difference of bowel sound return time between groups of intervention and control after being given chewing gum intervention among post-laparotomy surgery patients.

METHODS

Study Design
The design of this study was a quasi-experiment post-test only control group.

Sample
The population of this study was all post-laparotomy surgery patients. Samples were taken using purposive sampling technique. The criteria of respondents' inclusion were post-laparotomy surgery patients with general anaesthesia who underwent surgery for 60 minutes and were not inserted with NGT, so that a sample of 30 respondents was obtained.

Instrument
The data were taken using an observation sheet instrument with measurements using a stethoscope and digital watch. The observation sheet contains the respondent's number, age, gender, weight, height, body mass index, medical diagnosis, type of anesthesia, length of surgery, hours when the patient is aware, hours of early intervention mobilization, hours of intervention for chewing gum, hours of measurement of bowel sounds and the amount of bowel sounds. According to Van Bree et al. (2014), bowel sounds will return within 24-48 hours after abdominal surgery with the use of general anaesthesia. If bowel sounds do not return to normal within 3-5 days after surgery, patients can be said to experience postoperative ileus (Bashankaev et al., 2009).

Intervention
Chewing gum will cause intestinal peristaltic due to activation of the cephalic-vagal pathway which stimulates the cerebral cortex and hypothalamus to secrete digestive enzymes so that later can stimulate myoelectric intestinal activity and will counteract the effects of gastrointestinal opioid receptors activation (Hall & Guyton, 2011). A good gum is a free-sugar type because it will prevent an increase in blood sugar for patients who have a history of diabetes mellitus. The taste of chewing gum can be adjusted to the desires of respondents in the intervention group (Andersson et al., 2015). The right time to give gum to patients after laparotomy surgery should be started when the patient is fully aware (more than 2 to 3 hours after surgery), and there are no contraindications (Tazegül Pekin et al., 2015). The duration of chewing gum is the best, according to Choi et al. (2014) is around 30-40 minutes. This time is considered most effective because it will not overload the patient in chewing gum for too long, so the patient will still be able to follow the treatment process properly.

Data Collection
The retrieval of data was carried out in July 2018 in a women's surgical ward in one of the hospitals in West Java. Data collection techniques used in this study were administrative techniques and intervention techniques. Administrative techniques started from taking care of ethical permits at the research location, providing explanations and equations of perceptions related to research procedures to trained surgical nurses in the research location, as well as determining prospective respondents both control and intervention groups. The second data collection technique was an intervention technique that began with the researchers introducing to prospective respondents and explaining the procedure for measuring bowel sounds. The researchers confirmed again before the surgery that prospective respondents were willing to take part in the research, and gave the opportunity for respondents to ask questions and filled out the consent sheet to take part in the informed consent before the surgery took place, the researcher had to wait for the respondent to arrive at the nursing room where the respondent had been in the recovery room for the recovery process, early mobilization which is the standard of care for post-operative patients at the study site and at the same time the researchers gave gum-chewing interventions in the intervention group after 30 minutes of respondents were inpatient room, gum-chewing intervention was given and periodic bowel measurements were measured.

Data Analysis

The data were analyzed using frequency distribution and Mann Whitney.

Ethical Consideration

This study has been approved by the Research Ethics Committee of Hasan Sadikin Hospital (Approval number: No. LB.04.01/A05/EC/132/V/2018). Before the research was conducted, the researchers asked the respondents for approval through an informed consent sheet. Respondents were given an explanation regarding the purpose, benefits, risks and inconveniences during the study, and the researcher gave the opportunity to the respondent to ask about the procedure that was felt to be less understood. If the respondent refused to be involved in the study, the researcher would not force and continue to respect the rights held by each respondent.

RESULTS

Table 1 showed the frequency distribution of post-laparotomy surgery patients as respondents based on age characteristics according to Department of Health (2009), sex, body mass index (BMI) according to Department of Health (2011), type of anaesthesia and length of time of surgery.

The frequency distribution of respondents based on age level is mostly 36-45 years old (Late Adult), which is as much as 12 (40.0%). All respondents were female. The frequency distribution of respondents based on body mass index (BMI) mostly had a body mass index (BMI) of 18.5 - 25.0 (Normal), which was 13 (43.3%). All of the respondents in this study used general anaesthesia during the surgery and had the same duration of surgery, which is 60 minutes.

Table 1 The Characteristics of Post-Laparotomy Surgery Patients in a Women's Surgical Ward in one of the Hospitals in West Java 2018 (n=30)

Respondents' Characteristics	Intervention group		Control group		Total	
	f	%	f	%	f	%
Age						
17 – 25 years old (Late adolescence)	6	40.0	3	20.0	9	30.0
26 – 35 years old (Early adulthood)	5	33.3	4	26.7	9	30.0
36 – 45 years old (Late adulthood)	4	26.7	8	53.3	12	40.0
Sex						
Male	0	0	0	0	0	0
Female	15	100.0	15	100.0	30	100.0
Body Mass Index (BMI)						
<17.0 (Heavily Underweight)	0	0	0	0	0	0
17.0 – 18.4 (Mildly underweight)	1	6.7	3	20.0	4	13.3
18.5 – 25.0 (Normal)	6	40.0	9	60.0	13	43.3
25.1 – 27.0 (Mildly Overweight)	3	20.0	1	6.7	4	13.3
>27.0 (Heavily overweight)	5	33.3	2	13.3	9	30.0
Types of Anesthesia						
General Anesthesia	15	100.0	15	100.0	30	100.0
Duration of Surgery						
60 Minutes	15	100.0	15	100.0	30	100.0

Table 2 Comparison of the Bowel Sound Return Time of the Post-Laparotomy Surgery Patients in Women's Surgical Ward in one of the Hospitals in West Java 2018 (n=30)

Respondent Group	Median (minutes)	Minimum (minutes)	Maximum (minutes)
Intervention Group	90	60	150
Control Group	150	90	150

Table 2 illustrates the bowel noise return time of post-laparotomy surgery patients in Women's Surgical Ward in one of the Hospitals in West Java in a group given gum-chewing intervention with a median value of 90 minutes, a minimum value of 60 minutes and a maximum value of 150 minutes (more than 120 minutes). The control group that was not given gum-chewing intervention has a median value of 150 minutes (more than 120 minutes), a minimum value of 90 minutes and a maximum value of 150 minutes (more than 120 minutes).

Table 3 Differences in the Bowel Sound Return Time of the Post-Laparotomy Surgery Patients (n=30)

	N	*p*-value
Bowel Sound Return Time of the Post-Laparotomy Surgery Patients (Intervention and control groups)	30	0.005

Before conducting a test to see if there is an effect of giving a gum-chewing intervention to the return time of bowel sounds of a patient after a laparotomy surgery, a normality test for the data was conducted first. The normality test used was Shapiro-Wilk because the number of respondents was less than 50. with sig value or *p*-value obtained was 0.019 (<0.05), which indicated that the data on the return time of bowel sound of post-laparatomy surgery patients in the intervention group was abnormally distributed. Meanwhile, the value of sig. or *p*-value in the control group was 0.000 (<0.05), which was also abnormally distributed.

Th result of Mann Whitney test revealed that the *p*-value was 0.005 (<0.05), which indicated that there was a significant difference in the return time of bowel sound in post-laparotomy surgery patients between the intervention group and the control group (see Table 3).

DISCUSSIONS

Based on the results of the study in table 2, it is seen that the respondents who did not get gum-chewing intervention and were only given standard care, namely early mobilization after laparotomy surgery (control group), had a bowel sound return time of 150 minutes (or more than 120 minutes) after early mobilization. Meanwhile, respondents in the intervention group who were given standard early mobilization interventions and additional intervention to chew gum after laparotomy surgery had 90 minutes return time of bowel noise after the intervention.

Findings also showed that there was a time difference in the return of bowel noise between the intervention and control groups in post-surgical laparotomy patients. The intervention group has a return time of bowel sound 90 minutes after the implementation of the gum-chewing intervention and early mobilization, while the control group's return time of bowel sound is around 150 minutes or more than 120 minutes after the intervention was given. This result was in line with the previous research conducted by Bastiana (2016) that patients after laparotomy surgery who were given standard intervention in the form of early mobilization had an average return of bowel sounds at 240 minutes after the intervention.

All respondents in this study received early mobilization interventions of the same type and duration. The implementation of early mobilization intervention in post-laparotomy surgery patients could improve blood circulation and accelerate the return of physiological functions, including the digestive system, namely intestinal peristalsis (Castelino et al., 2016).

The return of bowel sound in 90 minutes in the intervention group could be caused by a mechanism of action when chewing gum where intestinal peristalsis will occur due to the activation of the cephalic-vagal pathway. The chewing movement will stimulate the cerebral cortex and hypothalamus to secrete digestive enzymes, which can later stimulate myoelectric intestinal activity and will counteract the effects of gastrointestinal opioid receptor activation (Hall & Guyton, 2011).

Free-sugar chewing gum with the brand Xylitol was chosen by researchers because it can prevent the risk of increasing blood sugar for patients who have a history of diabetes mellitus (Andersson et al., 2015). Before the research was conducted, the researchers checked the respondents whether they were allergic to gum with the type of Xylitol or not. In addition, monitoring for 30 minutes after observation of bowel sound for 120 minutes was also performed, and no problems or allergies were found in respondents who had been given an intervention to chew gum.

The intervention of chewing gum on the respondents was given after the patients were in the treatment room for 30 minutes, in which the patient had already been in the recovery room for postoperative recovery for two hours. According to the previous research (Tazegül Pekin et al., 2015), a gum-chewing intervention can be done after the patient is fully aware, i.e. more than 2 to 3 hours after surgery and no contraindications. Patients are encouraged to chew gum for only 30 minutes. This is because according to the research by Choi et al. (2014), the best duration of chewing gum is around 30 to 40 minutes. This is the most effective duration because it will not overload the patient in chewing gum for too long, so the patient will still be able to follow the treatment process properly.

Our findings were also in line with a previous study which proved that chewing gum could accelerate the return of bowel sound in patients after laparotomy surgery. Research by Tazegül Pekin et al. (2015) stated that chewing gum proved to be safe and well-tolerated in patients after gynaecological laparotomy pelvic surgery type to accelerate the occurrence of flatus, defecation, recovery of bowel sound, prevent vomiting, and shorten the hospital stay. Average bowel sound returns in the first four hours after patients were given intervention both in the form of chewing gum and early mobilization. Patients in the intervention group who were recommended to chew gum after laparotomy surgery proved that there were more people who had the bowel noise return in the first four hours compared to the control group. In addition, patients also had a faster time to discharge flatus, which were about 2.2 days in the intervention group and three days in the control group.

In addition, the findings also confirmed a previous research conducted by Husslein et al. (2013) who also stated that chewing gum could reverse the gastrointestinal function of patients after laparotomy surgery with gynaecological indications. The return

of bowel sound was heard earlier in the intervention group by chewing gum, which was about the hours after the patient was aware and immediately given the intervention, whereas, in the control group that was not given gum-chewing intervention, bowel sounds were heard only after five hours.

Another study also stated that, patients after laparotomy surgery with indications of prostatectomy without intestinal manipulation who were implemented with gum-chewing intervention after surgery also experienced a faster time of the return of bowel sound, which is about 46.1 hours after the implementation of chewing gum intervention compared to the group without the intervention of chewing gum who had a return of bowel noise of around 60.7 hours. This can shorten the treatment time of post-laparotomy surgery patients in hospitals (Choi et al., 2014). And Terzioglu et al. (2013) also reported that if post-laparotomy surgery patients in gynaecological cases were given an early mobilization and gum chewing intervention, the bowel sound would be heard more quickly, i.e. 2.5 hours to a maximum of 10 hours compared to if only one of the interventions were done.

This proves that the return of bowel noise in post-laparotomy surgery patients can be faster if early mobilization that has been done previously both abroad and in Indonesia as a method to accelerate the return of intestinal peristalsis in patients after laparotomy surgery can be combined with the intervention of giving chewing gum. That is because chewing gum has been proven to be safe, simple and can be applied either through single intervention or multi-model intervention to improve bowel sound and prevent complications after laparotomy surgery.

The difference in the return time of bowel sound in the intervention and control groups can be attributed to several factors. If seen from the results of the study in table 1, it shows that the average of age of respondents was between 36 and 45 years old, which were most likely in 12 respondents (40.0%). According to Kozier et al. (2010), respondents in adulthood to the elderly age have a longer time in recovering intestinal peristalsis postoperative with general anaesthesia and are more at risk of experiencing the delayed return of bowel sound after surgery if no proper treatment is done. This is because the body's physiology has decreased with age, and one of them has an impact on the digestive system, such as intestinal peristalsis in postoperative patients. According to the results of Bastiana (2016), it was reported that the longest process of restoring bowel sound after the laparotomy surgery was around 240 minutes - 480 minutes after the intervention of early mobilization occurred on average in late adult patients, elderly and old age.

All respondents in this study were female which amounted to 30 people and were divided into two groups namely intervention and control groups. All respondents were women because this study was conducted in a women's surgical ward in one of the hospitals in West Java which was the place of care for female surgical patients with obstetric and gynecological indications. The overall sex of the female respondent was also associated with the influence of the return of bowel noise, because physiologically women will be more at risk of experiencing delayed postoperative bowel noise due to hormonal activity in women such as

menstruation, pregnancy, contraceptive use and menopause (Hall & Guyton, 2011). Therefore, it is necessary to have appropriate intervention to accelerate the return of bowel sound in women after laparotomy surgery under general anesthesia.

Laparotomy surgery is not only performed on women but also on men. According to the results of a study conducted by Bastiana (2016), the most widely performed laparotomy surgery in men is laparotomy open prostatectomy and herniopathy. The majority of the respondents in this study had a body mass index in the normal range of 18.5 - 25.0 as many as 13 people (43.3%). The difference in the time of the return of bowel sound in post-laparotomy surgery patients between the intervention and control groups could also be due to body mass index. Someone with an excess body mass index will have a greater risk of delaying the return of bowel sounds after surgery because the gastrointestinal tract is coated with fat so that the digestive system's work process is blocked, one of which is the intestinal peristalsis (Kozier et al., 2010). Based on the previous research, patients with laparotomy under general anaesthesia who have a normal body mass index have an average return of bowel sounds in 240 minutes after the implementation of early mobilization interventions (Bastiana, 2016).

The type of anaesthesia used by all respondents in this study is general anaesthesia. This can also be attributed as a factor that influences the difference in the time of the return of bowel noise between the intervention and control groups in post-laparotomy surgery patients. The use of general anaesthesia on surgery has more effect on decreasing intestinal peristalsis compared to regional anaesthesia, because the use of general anaesthesia will stimulate non-cholinergic non-adrenergic, thus blocking the neurotransmitter in the myenteric plexus or aurbach in the abdominal smooth muscle, namely the muscular externa. The myenteric plexus or auerbach is a part of the nervous system located between the circular and longitudinal external muscular which functions to regulate movement in the intestinal wall (Hall & Guyton, 2011). Therefore, laparotomy surgery patients with general anesthesia will have a higher risk of experiencing a the return of bowel sound after surgery.

All respondents had the same duration of surgery, namely 60 minutes. The duration of surgery can also be a factor that causes differences in the return of bowel noise between the intervention and control groups in post-laparotomy surgery patients. The longer the surgery takes place, the higher the dose of the anaesthetic used in the patient. High-dose anaesthesia will extend the duration of post-surgery and increase the risk of delayed recovery of intestinal peristalsis (Sjamsuhidajat & Wim, 2010).

One of the nursing implications in this study is related to the caregiver who applies Betty Neuman's model theory to patients post laparotomy surgery. The role of caregiver in this study is to deal with the stressors faced by patients with primary intervention. The primary intervention included an initial assessment of bowel sounds and the implementation of non-pharmacological interventions to chew gum to accelerate recovery of intestinal noise in patients post laparotomy (Kozier et al., 2010). In addition, the importance of the role of nurses as

educators in providing education and direction to patients after laparotomy surgery is related to the compliance that must be followed by patients and families on the rules of postoperative feeding and drinking. Nurses must also teach patients how to chew gum correctly and explain the purpose and benefits of applying non-pharmacological interventions for the healing process (Kozier et al., 2010). It is expected that with the application of the role of nurses based on the Betty Neuman model theory, it can accelerate the recovery time of bowel sounds and prevent further problems from occurring.

CONCLUSION

Our findings found that there was a difference in the return time of bowel sound between the intervention and control groups. The intervention group that received standard early mobilization coupled with gum-chewing intervention had a return time of bowel sound around 90 minutes, while the control group that only received standard intervention in the form of early mobilization had a return time of bowel sound more than 120 minutes. This proved that chewing gum has an influence in accelerating the return of bowel sound in post-laparotomy surgery patients, preventing the risk of postoperative ileus complications and shortening the length of hospital stay. A recommendation for future research is to observe more complete bowel sounds in patients after laparotomy surgery so that it can help reducing the risk of postoperative ileus complications. The study can be replicated in a larger sample in different settings so that the findings can be generalized to a larger population.

Author Contribution
All authors have contributed in the preparation of the manuscript. **WMA** provided article development and ideas, reviewed theories and literatures, analyzed, interpreted data, and drafted manuscript. **CI** and **RM** criticized and analyzed the manuscript. All authors made final approval of the manuscript.

ORCID
Warisya Miftah Amanda https://orcid.org/0000-0002-7752-4609
Chandra Isabella H.P https://orcid.org/0000-0002-9632-8275
Ristina Mirwanti https://orcid.org/0000-0001-8600-2784

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