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TOWARD AN UNDERSTANDING OF NURSING KNOWLEDGE DEVELOPMENT

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Abstract
As nurses, we seek to better understand how to apply nursing knowledge in our daily practice. Nowadays, the term philosophy is widening used in many areas, including nursing. However, there is existence of unclear understanding about nursing knowledge development derived from standpoint of philosophical and methodological perspectives. This article discusses about this issue and mainly focus on empiricism, post positivistic view, the philosophy of Buddhism and an example related to asthma.

Keywords: nursing knowledge development; philosophy; wisdom

Overview about nursing knowledge from philosophical view
The etymology of philosophy is rooted from the Greek and Latin with the meaning of wisdom or knowledge. Generally, philosophy studies about universal phenomena which are abstract and ultimate that people concerns through the long history consist of the nature of existence, knowledge, morality and purpose (Bruce, Rietze, & Lim, 2014). In context of nursing, philosophy describes system of nurse’s belief and perspectives about profession in nursing practice, scholarship and research at clinic, family and community setting (Gortner, 1990). Philosophies of nursing have been started for over a century (Rutty, 1998). So, how is nursing knowledge derived from philosophy? There is diversity philosophical orientations identified relevance to nursing knowledge development, such as “empiricism, pragmatism, paradigmatic historicism, and science as a problem solving, feminism, phenomenology, hermeneutics, critical theory, and post-structuralism” (Gunawan, 2016).

In the view of holism, the health of human beings is interrelated combination among bio-psycho, social and spiritual dimensions. Therefore, holistic nursing practice also is integration of knowledge from various sources (Hanucharurnkul & Turale, 2017). Although knowledge is formed and built from science by scientific results (Gortner, 2000), nurses encountered experience in everyday practice by evaluating the truth of an observation, or determining the best course of an action, or other practices (Bruce et al., 2014). Contrarily, Carper pointed out four patterns of nursing knowing from philosophical foundation of knowledge development, named: empirics,
personal knowledge, anaethetics, and ethnics. (Carper, 1999) Although initial problem was primarily related to only one pattern, these four patterns are interrelated in clinical practice, created comprehension in nursing outlook (Hanucharurnkul & Turale, 2017). Following Caper, Chinn and Krammer identified the fifth pattern. That is emancipatory knowing which combines between “traditional social ideas and the developing dimension of nursing knowledge”. This pattern not only positively changes the workplace environment but also effectively impacts on outcomes for patients and nurses (Hanucharurnkul & Turale, 2017). Generally, all these philosophical perspectives influence comprehensive nursing knowledge development and all of them have two dimensions, including epistemology and ontology.

Epistemology focuses on the development, identification and validation of knowledge to answer (Bruce et al., 2014) questions about how knowledge occurs, how people develop knowledge, what justification is and methods to explore human lived experience (Cody & Mitchell, 2002). In nursing, nurses trust in valid and reliable knowledge as well as verifiable knowledge related to phenomena identified. Meanwhile, the ontological dimension which is the nature of the entities represented in the metaparadigm, concentrates on the nature of nursing, personhood, environment, health and illness (Bruce et al., 2014). This dimension connects both knowledge and practice. Academic research and nursing theory development have tended to be a noticeable focus in discussion of nursing knowledge for a long time (Chinn, 2010). The nature of nursing knowledge is integrated, thus dimension of ontology from philosophical perspective is a main root to complete combination of theory and practice (Chinn, 2010; Gunawan, 2016).

Empiricism and nursing knowledge development

Valuing nurse’s philosophical viewpoint from paradigms is crucial to understand the growth of nursing as a discipline. Empiricism is one of common nursing paradigms which is important to explore nursing knowledge development under philosophy aspect (Elizabeth J. Monti & Martha S. Tingen, 1999). Empiricism is equal to positivism and illustrates through a mechanistic, reductionist and quantitative (Gortner, 1990). This paradigm is considered as science today. Additionally, it plays a vital role in applying nursing theory and is a link between nursing practice and theory (Polifroni & Welch, 1999). The ontological assumption of empiricism is that there is a reality which is independent of context and truth could be established (Elizabeth J. Monti & Martha S. Tingen, 1999). Science builds and forms knowledge from scientific results. The final product of science is theory (Carper, 1999; Gortner, 2000). On that way, empirical knowledge is generalized into laws and theories and is used to predict phenomena in nursing discipline. And as a circle, empirical knowledge based on the sources of theories and research (Carper, 1999; Gortner, 2000). To make clear about contribution of empiricism in nursing knowledge development, it could be presented in three sessions as following:

(1) In nursing practice

According to Guba & Lincoln, empiricism was based on the assumption that known could be verified through the senses; the epistemological claimed that reality came from senses without bias; it was indeed relevant to every practicing nurse because such issues were rooted in the way in which nursing practice was organized and actualized. In nursing practice, based on the assumption of empiricism, nurses might perform actions by understanding or knowing the end goal of their actions (Guba, 1994).

(2) Nursing theory

Giuliano claimed that empiricism was a bridge linked nursing theory to nursing practice. In other words, empiricism is essential for nursing science to substantiate claims regarding nursing care and responses of human beings in situation of health and illness as well as to provide explanatory models; to test and to generate theory ((Giuliano, 2003). Testing
hypothesis by empiricism allows relationships in theories to be valid. Therefore, establishment of valid relationships enables theories to be used in explainable, predictive and prescriptive notions that are essential and relevant for clinical practice. Orem’s Self Care Deficit Nursing Theory is the prime example that Orem used the empiricism to create this theory which has been applying widely in nursing research and practice (Jackson, 2015).

(3) In nursing research
Empiricism is based on the assumption that methodologies associated with empiricism are the scientific methods. Those methods focus on the experiments, controls, objectivity, precise measurements and quantification of data (Elizabeth J. Monti & Martha S. Tingen, 1999). The empiricism contributes to nursing research as facilitating the development and testing of hypotheses, intervention comparisons, and the setting up relationships between variables. Quantitative methods often are used in adherents of the empirical paradigm. Research methodologies commonly employ in empirical paradigm include experimental studies, surveys, and the evaluation of secondary-source data such as systematic review (Gillis & Jackson, 2002). Generalizability in empirical research allows relationships to be extrapolated to larger population or different situation, which would be advantageous in nursing practice and nursing research (Giuliano, 2003).

(4) In nursing education
Nursing education based on "knowledge or reality is obtained through the senses and observations" as assumption of empiricism. Nursing practice courses are constructed to allow the students learn by observing, doing and experiencing nursing reality in laboratories and clinics. Since the world of nursing have been rapidly evolved and changed, it is more important for students learn how to transfer knowledge from a situation to others. Finally, nurse students can make decisions by critical thinking specific to a situation. In nursing graduate education, based on assumptions of empiricism, nursing doctoral students could be able to formulate their own worldview of phenomenon, can describe what nursing is and its phenomena of concern and delineate differences between nursing perspective and other professional disciplines (DiBartolo, 1998). By getting knowledge at the same time with other courses such as nursing theory development or advanced research, nursing doctoral students are able to develop and test hypotheses and theory, make comparison among interventions, and establish relationships between variables.

However, many nursing scientists consider empiricism often cannot reflect the values and beliefs of nursing discipline. Focusing of empiricism paradigm on holism, person-centred care, and understanding of human experience is impossible (Gennello, 1997). In empiricism paradigm (Guba, 1994), researchers try to control confounding variables in order to expand the validity of the study results but it is not easy in nursing science when we study on the humans. Additionally, if researchers control numerous factors, they may miss the important context; hence the study results may become artificial and has low generalizability. Those issues make nursing scientists think that person in empiricism studies is more like a machine than a human being who has interaction with the environment (E. J. Monti & M. S. Tingen, 1999). Furthermore, empiricism is not aware of aesthetics, ethics and personal knowledge which cannot always be verified. Since human is very complex, they are emotional and have their own behaviour that are almost unable to predict and measure, so total certainty is impossible (Mitchell & Cody, 1992). Therefore, contemporary empiricism is necessary in nursing field. In the 1980s and 1990s contemporary empiricism came as a way to broaden the scope of empiricism (Giuliano, 2003).

Contemporary empiricism and nursing knowledge development
Contemporary empiricism is also called post positivism, a paradigm that can be applied to the scientific observations by empirical methods within appropriate contexts. Interpretative knowledge is also one of
accounts of contemporary empiricism (Giuliano, 2003). The methodology of contemporary empiricism include: experimental/manipulative, falsification of hypothesis, and may include qualitative methods (Giuliano, 2003). There are three major assumptions underlying contemporary empiricism:

(1) Predictability versus universality. Total predictability is impossible. And contemporary empiricism seeks only for further understanding rather than to complete this understanding, a phenomena in all its complexities (Weiss, 1997). It clearly states that there is no universal existing theory that can explain every phenomenon, and the goal of scientific knowledge is to constantly enhance our understanding by different methods of enquiry, rather than to seek the definite facts for all time. This is the major difference between contemporary and traditional empirical approaches (Giuliano, 2003);

(2) Knowledge to improve nursing science. Nursing science needs to generate knowledge in order to help explained human reaction and predicted the effectiveness of nursing interventions which are the essence of nursing social value. Observation and description of a phenomenon is important in understanding and developing knowledge which could be done by qualitative research (Giuliano, 2003);

(3) Analysis and synthesis. Breaking down the whole into parts and analysing each piece carefully would help nurses understand its properties deeply. Constantly, synthesising various aspects into a whole can help nurses grasp the value of the parts in the holistic event (Giuliano, 2003).

There are two major tenets of contemporary empiricism, including deductive reasoning and inductive reasoning. Deductive reasoning is mostly positivist or quantitative while inductive reasoning is qualitative (Weiss, 1997). Hanucharunrulk and Turale (2017) stated that the nature of nursing knowledge was integrated of various methods in conducting research; therefore, today nurse scholars use both qualitative and quantitative methods to solve and get answers for nursing problems in order to achieve comprehensive knowledge development and desirable outcome.

Buddhism and nursing knowledge development

As mentioned earlier, nurses work with human beings and belief and spiritual are important components of health and well-being. Each person, depending on her/his nation, ethic and culture has each religion which is great impact to the way people live and practice their health. Buddhism has a long association with the healing arts and connection with modern medicine. The Buddha revealed three “signs” of human suffering of a kind encountered in medical practice on a daily basis, including old age, sickness, and death (Keown, 2012). The Buddhist worldview believes in karma as the relation between acts/reasons and its subsequent consequences (Keown, 2012). The Four Noble Truths in the Buddhist philosophy state that (1) life entails suffering; (2) suffering has an obvious cause; (3) ending of suffering is possible; (4) a path leading to the end of suffering is given (Keown, 2012). Base on the four truths, an example of medical analogy is given following contemporary Indian medical practice, in which (1) making a diagnosis; (2) establishing an aetiology of the disease; (3) determining a prognosis and (4) providing a plan of treatment and care (Keown, 2012).

Additionally, the Buddha states that well-being is the interactive result of good karma in the past and vice versa therefore, the Buddha also emphasizes respect to diet, exercise, alcohol and avoidance of stress (Keown, 2012; Ratanakul, 2004). Evidently, we can see the influence of Buddhism on the way of life, health-related beliefs and health behaviour management. As a result, it would be benefit if nurses integrate Buddhism principles into nursing care for people generally and Buddhist practitioners specifically (Chinnawong, 2007). Understanding about Buddhism once has been applying in nursing care would help nurses
have ability to provide religiously apposite care for patients who are practice that religion. For example, in Vietnamese context, Buddhism practitioners do not eat any kind of meat in the first day and the fifteen day of a month following lunar calendar. Therefore, when nurse takes care for those patients, nurse must consider about this issue in diet plan (ElGindy, 2005). Consequently, the patient’s quality of life is improved and they are more satisfied with nursing care (Chan, Poon, & Hegney, 2011). Actually, nurses have realized that it is worthwhile to listen the voices of religion and apply religion in nursing care, not just only about meditation, psychological care but also physical care as previous example (McCaffrey, Raffin-Bouchal, & Moules, 2012).

**An example of empirical, post positivistic paradigms and Buddhism perspective to asthma health issue**

As we know, asthma is one of the major non-communicable diseases with the prevalence of asthma is increasing worldwide. It was estimated that 235 million people had suffered from asthma globally in recent years and approximately 383 thousand deaths due to asthma in 2015 (WHO, 2017). Vietnam is a developing country in ASEAN area. According to Joint Annual Health Review, asthma is one of main burden diseases (MOH, 2016). Although asthma cannot treat permanently, it can be prevented by management behaviour related to control asthma triggers such as smoke, mites, diet and cold weather (Friend & Morrison, 2015).

Applying empirical perspective, a suppose question could be, what are factors related to behaviour management among asthmatic patients? There are several studies have been conducted to explore factors related to asthma management behaviour with some theories that can explain patient’s behaviour such as Self-Management or Precede and Proceed model common-sense model. In this study, the researcher can set hypotheses about relationships between some significant factors and asthma management behaviour based on literature review and theory. The quantitative method can be used through reliable and valid tools to test proposed hypotheses. Hence, data analysis is done statistical methods to test hypotheses.

Applying contemporary empiricist view, the research also can observe what patients do to manage their asthma and also go in-depth interview or group discussion to get data to answer the research question that what they do and why they do those actions of asthmatic management? Understanding gained from qualitative research can be used to develop new theory that describe phenomenon of asthma management among asthmatic sufferers.

Applying the Buddhism perspective, the researcher may raise a question that “what are differences between group of Buddhist patients and non-Buddhist patients?” An answer may get that Buddhist patients may have higher awareness and practice in control asthma triggers such as smoke – a leading cause of asthma attack because the fifth precept of Buddhism for Buddhistic practitioners is taking in toxicating substances such as drug or drink or smoke, etc. Hence, understanding about religion will help nurse predicted about patient’s behaviours.

**Conclusion**

This paper provides the insight of knowledge of all philosophy approaches in nursing knowledge development. However, we can recognise that using philosophy propose nurses may better understand the role, function, and thinking philosophically to the worldview. Philosophy is not only understood as relevant but vital to our discipline and professional practice.

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**Author Contribution**

This is the original work of the corresponding author.
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QUALITY OF LIFE OF PATIENTS WITH END-STOMA IN MEDAN: A PHENOMENOLOGICAL STUDY

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Abstract
Background: Colorectal cancer continues to be a serious problem in Indonesia. A common colorectal treatment is surgical removal of the diseased colon, followed by the creation of a colostomy through the abdominal wall to bypass the colorectal function of emptying waste products. Those who require permanent colostomy are likely to have quality of life issues impacting their physical, psychological, social, and spiritual needs. There issues impact persons’ life satisfaction, happiness, and overall quality of life.

Objective: The aim of study was to describe the experiences of patients with end-stoma regarding their quality of life.

Methods: The study design used descriptive phenomenology following the approach of Collaizzi. There were 12 participants who qualified using purposive sampling based on the inclusion criteria. The data were gathered in-depth interviews. Analysis and interpretation used verbatim descriptions in Bahasa Indonesia and subsequently translated into English language.

Results: The research emerged seven themes, namely: (i) becoming limited in doing daily activity, (ii) having limitation during sexual and social intercourse, (iii) having various negative feelings after the existence of end-stoma, (iv) having financial difficulties, (v) attempting to survive with end-stoma, (vi) experiencing changes in fulfilling rest and sleep, physical, and complication, and (vii) having expectation which has to be achieved after having end-stoma.

Conclusion: The results show that patients with end-stoma run into spiritual, social, psychological and physical disorder that affect the quality of their life. This study provides an understanding of the quality of life of patients with end-stoma and nurses are able to provide appropriate nursing care.

Keywords: quality of life; colorectal cancer; end-stoma

INTRODUCTION

Colon cancer continues to be a problem in Indonesia. The number of patients with colon cancer rank tenth (2.75%) after other cancers such as uterine, breast, lymph nodes, skin, nasopharyngeal, ovarian, rectal, soft tissue, and thyroid (Ibrahim, Priambodo, Nur‘aeni, & Hendrawati, 2017). The WHO has found that colon and rectal cancer are the third most common cancer in men and second women worldwide. The incidence of colorectal cancer in the United States shows nearly 145,000 new cases and 50,000 deaths annually (Smeltzer et al., 2008). Meanwhile in Indonesia the incidence rate of colorectal cancers is quite high, and increasing in number at the above age of 40 (Sjamsuhidajat,
The number of cases 12.8/100.000 residents, claiming the third most prevalent type of carcinomas in Indonesia (MoH, 2015).

A common colorectal treatment is the surgical removal of the diseased colon, followed by the creation of a colostomy through the abdominal wall to bypass the colorectal function of emptying waste products (Ibrahim et al., 2017). Each year approximately 100.000 patients undergo stoma surgeries. More than 70.000 people in the United Kingdom, and approximately 120.000 in the United States experience stomas every year (Ozturko, Unal, Yildrim, & Ozlem, 2015). Those who require permanent colostomy are likely to have quality of life issues impacting their physical, psychological, social, and spiritual needs. There issues impact patients’ life satisfaction, happiness, and overall quality of life (Alwi, Asrizal, & Locsin, 2017).

Quality of life is a series of subjective components reflecting aspects of patients’ physical, emotional, occupational and social experiences. WHO has defined quality of life as an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (WHOqol, 1995).

In the study in China, it was found that experiencing functional difficulties at work and social circumstances, having sexual issues and body image, and some functional problem; anxious about privacy when empty the bag, always anxious about leakage, always anxious about social activities, gas, travelling, and skin irritation (Liao & Qin, 2014). Also, another study shows that the scores of quality of life are generally better than preoperative levels until the sixth month postoperative, but social function, body image, chemotherapy side effects and financial difficulties are unusual. Patients without a permanent colostomy have a better score in most categories of quality of life than a permanent colostomy (Yang et al., 2014).

The study by Kimura, Kamada, Guilhem and Monteiro revealed that the quality of life stoma patients was very bad (11.11%), bad (48.16%), neither good nor bad (14.81%), good (22.22%) and very good (3.70%) did not present a unidirectional finding. In fact, the results showed that bad experience and good experience held the first two highest percentage scores indicating the inconsistency in the experiences of patients with stomas (Kimura, Kamada, Guilhem, & Monteiro, 2013).

Based on the results of the research above shows that the quality of life of stoma varies widely. The quality of life of patients with end-stoma very important to explore so as to determine anticipatory programs and improve the rehabilitation results of patients with end-stoma. Therefore, this research will study the various perceptions or experiences in depth of patients with end-stoma regarding their quality of life.

**METHODS**

**Study design**

The study used qualitative with design descriptive phenomenology. Why this design was chosen is that the experience of participants can be explored to be more revealed that the image of the patients experience with end-stoma regarding their quality of life can be real. Moreover, the study explores, analyzes and describes directly the phenomena of the patients’ experience, that tells about the quality of their life after being installed end-stoma with as freely as possible from an intuition that cannot directly be measured (Speziale, Streubert, & Carpenter, 2011).

**Sample**

Twelve patients with end-stoma who volunteered to participate in this study were selected by purposive sampling. Inclusion criteria included: 1) willing to be a participant, 2) no communication disorder, 3) physically and mentally healthy, 4) freedom...
from other diseases, and 5) no history of stoma in their family member.

Data collection
Data collection was conducted by in-depth interviews and the probing technique is used to ask questions to get deep information about their experiences recorded by voice record. Each participant was informed of the purpose of the study and a consent form guaranteeing participants anonymity and confidentiality was signed. The participants were able to withdraw from the study at any time. The time and place of the interview were arranged depending on participants’ preferences but all of the participants were interviewed in their homes. Researchers attempted to arrange a calm environment in which the participants could be interviewed. Each interview lasted about 55-60 minutes. Data collection continued until saturation, where no new information is obtained and redundancy is achieved (Polit & Beck, 2008). After that, the researchers used verbatim descriptions in Bahasa Indonesia and subsequently translated into English language and grouped the data into the form of themes, sub-themes and main categories.

Instrument
The researchers using the instrument in this study were the researchers themselves. Using semi structured interviews with the interview guide consists of 5 open-ended questions were developed by the researchers themselves and have been validated by three experts in stoma.

Table 1 Open-ended questions for interview

<table>
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<th>No.</th>
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<td>1.</td>
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<td>3.</td>
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<td>What are your obstacles and challenges that you feel after have stoma?</td>
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<td>5.</td>
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Ethical consideration
This study was approved by the Commission of Health Research Ethics of the Faculty of Nursing University of Sumatera Utara (Approval No. 1229/VI/SP/2017).

Data analysis
Using software Welf-QDA version 1.0.1, it has been helped researchers to data analysis. Researchers used the Collaizzi method (Polit & Beck, 2008). The process of data analysis includes; 1) reading and rereading all transcripts of interviews that participants have disclosed, 2) extracting of significant statements related quality of life of patients with end-stoma, 3) describing the meaning contained in the significant statements, 4) organizing the meaning formulated into the theme group, 5) developing a complete theme description, 6) identify the structural basis of the phenomenon, and 7) returning to the participant to validate the finding of phenomenon. The principles of trustworthiness were applied to ensure the rigor of the study (Schwandt, Lincoln, & Guba, 2007). A member checking was done with participants as ways of ensuring that the researchers have analyzed the data correctly (Gunawan, 2015).

RESULTS
The results of this study found seven themes: 1) becoming limited in doing daily activity, 2) having limitation during sexual and social intercourse, 3) having various negative feelings after the existence of stoma, 4) having financial difficulties, 5) attempting to survive with stoma, 6) experiencing changes in fulfilling rest and sleep, physic, and complication, and 7) having expectation which has to be achieved after having stoma.

Theme 1. Becoming limited in doing daily activity
Participants have experienced limitations in daily living activities both in spiritual and
physical activities. Spiritual activity that performs worship is a limitation, experienced by participants. Participants said obstacles in performing worship prayer in term of performing wudhu (taking ablution), the prayer is no longer acceptable or not due to wudhu problem. This corresponds to the participant's statement:

"...When praying, I'd also heard the same thing about it. They said it was acceptable...but they weren't also sure about it.it was so unintentional.... I did not mean it..." (Participant 6)

Physical limitation has been experienced by participants, which participants said long journey was being a problem and was unfree where to go, and the physical condition of the participants, where the energy is reduced, cause them to be powerless. This statement corresponds to the participant's expression:

"...Energy is also less automatic, lifting something we become very careful, because the energy comes from the stomach..." (Participant 11)

Theme 2. Having limitation during sexual and social intercourse
Obstacles have been experienced by participants in sexual intercourse such as worried about getting divorced and no longer having sexual intercourse. The statement in accordance with the expression:

"...I have never contacted her anyway. I was afraid..." (Participant 4)

When interacting with others, the obstacles the patients have are nerves, privacy, difficulties, and being introvert. The participants said it really affected their feeling in public. This statement is in accordance with the phrase:

"...It is arguably difficult. Actually, to get along with the public is very difficult, because defecation cannot be predicted. Just like normal defecating, so it could possibly smell due to the defecating..." (Participant 12)

Theme 3. Having various negative feelings after the existence of stoma
Most of the participants had negative feelings about themselves. The negative feelings felt by participants are feeling afraid, feeling alone, feeling suffer, upset easily, feeling inferior, and shameful. Some participants said they are afraid of leaking, smelling and disturbing the others. This statement is in accordance with the phrase:

"...In our sense, fear of leaking...somehow that person knows what we know..." (Participant 5)

Theme 4. Having financial difficulties
Participants had had many difficulties, especially in working; many participants quit their jobs due to end-stoma, while the cost of living increases because of need to buy stoma bags that are quite expensive. Most of participants have been experiencing job issues and financial difficulties. Some participants said they could not work. This statement is in accordance with the phrase:

"...It's been more than a year that I don't have any job..." (Participant 3)

Participants stated the high price of stoma bags and the amount of expenses incurred to buy stoma bags. The statement is as expressed by the participant:

"...It's such a waste of money for me to spend money on such things..." (Participant 4)

Theme 5. Attempting to survive with stoma
Participants have made many attempts; such efforts include attempts in making stoma bag, avoiding leakage, efforts to overcome irritation and efforts in treating stomas. This statement corresponds to the participant's expression:

"...I made my own colostomy bag size it is so expensive..." (Participant 12)

Efforts by participants to overcome the irritation are varied such as using Povidone iodine, using powder and wasp oil, Cusson baby powder, intravenous fluids, and hot water. The above mentioned disclosed some participants as follows:

"...Well, sometimes Povidone iodine, sometimes use powder..." (Participant 7)

"...Yes, it is wet, that's why I cleaned with the intravenous fluids...after cleaning and drying it, I directly stick on the stoma bag..." (Participant 2)

Theme 6. Experiencing changes in fulfilling rest and sleep, physic, and complication
Participants have undergone many changes, such as in the need for resting, where participants do not feel free, and often awake in the event of leaking stoma bag. Physical changes are also happened to patients who cannot feel the wind (flatus) and defecation. Participants also experienced complications around the stoma caused by outbreaks and also due to increased body weight. Some participants said that they slept so uncomfortably, due to disturbance, which their sleeping hours reduced. This is expressed by the participant as follows:

“...It’s not comfortable to sleep here. I have to move to the right and left. That’s why I prefer sleeping with fluffy pillows…”

(Participant 4)

Theme 7. Having expectation that has to be achieved after having stoma.

Participants will get to be able to work again, will get health education of stoma and will be unity for stoma patients. This statement is accordance with the expression by some participants:

“...If the future is still working, the term aids the term to the paddy field, if the heavy lifting cannot anymore, used to I can lift 90 kg…”

(Participant 3)

A participant said that hoping for the union of people who have a stoma so that they can share the experience of fellow stoma. This was expressed by the participants as follows:

“...Which seem like I hope there is unity like so we can tell about our experience, my hope there is no problem so…”

(Participant 1)

DISCUSSION

One of the causes of end-stoma is colorectal cancer. This will lead to limit daily living activities. Every human being does everything what he wants to live freely, but not patients with end-stoma. This situation can make who suffers from end-stoma feel limited to do everything. Patients with end-stoma deal with problem in performing religious worship activities. Some of participants have experienced limitations in performing worship, especially for congregational prayers at Masque. This limitation is due to many things, such as the feeling of being unacceptable or not and the smell coming out from dirt in the stoma hole.

According to literature, after stoma surgery, patients refrained from religious activities and experienced problems such as insufficient information and inability to obtain sufficient information (Herek, Akbas, Taylan, & Alabaz, 2003). While Kuzu et al. shows that the presence of stomas is significantly an aspect that affects the quality of life related to health and is associated by decreased activity of prayer (Kuzu et al., 2002). This finding is also in accordance with previous research which states of the eight participants, all experienced limitations in religious rituals or spiritual distress (Rangki, Ibrahim, & Nuraeni, 2014).

Important findings in this study were related to spiritual issues. Although not all participants stated that they had no major problems with spiritual problems, it is important for the nurse to pay attention to the spiritual and religious rituals of the patients. In Muslim, to be clean and free of anything like dirt, especially during prayer is compulsory. In that case, nurses need to optimize the hygiene as well as possible.

Limitations of physical activity in work were also experienced by participants after the end-stoma, where participants said they could no longer work due to the end-stoma. Patients with end-stoma experience difficulty in work and social situations with stoma function (Liao & Qin, 2014). It also shows that the biggest problem after the stoma is the reduced capacity to work (Golicki, Styczen, & Szczepkowski, 2013). Patients with inactive stages who worked 11.11% while those who did not work at all 27.77% (Kimura et al., 2013).

Marital relationship experienced limitations in which participants were afraid and had never any marital relationship after end-stoma. Individual sexual contact with a stoma is problematic due to the surgery itself, which can cause dysuria, pain during intercourse,
urinary incontinence, and reduction or loss of libido. Thus, quality of life significantly affects both sexes, among women, because women are more sensitive to changes in their body image, with negative feelings about having part of the body expelled and experiencing the stigma of being individuals with stoma, and among men, sexual disadvantages, as men suffer greater pressure on sexual performance (Kimura et al., 2013).

Stoma creates problems that may affect the relationship of patients with their intimate partners (Nichols & Riemer, 2008). According to literature, patients with stomas tend to be concerned about sexual problems, and sexual problems occur in patients, especially in the early period after surgery and stoma formation, and lead to further decline of quality of life (Symms et al., 2008). It turned out that almost half of the patients who were sexually active before the stoma surgery became inactive after the procedure. Therefore, referrals for sexual health counseling and evaluation may be more appropriate to patients with end-stomas.

In this study, it is proved that a variety of negative feelings were experienced by participants who were afraid of leaking, feeling alone, suffering, irritability, and embarrassment. One of the most common fears has expressed by patients with stoma is the fear of gas and odor. Because the stoma has no sphincter, flatus is removed unexpectedly as well as the stool removed from the stomach can make the patient feel dirty and abnormal (Williams & Hopper, 2003).

Problems that arise during the stoma are an economic problem where the job opportunities are at worst and the price of stoma bag is high. It is not easy for someone with a stoma due to the high cost of living, what is more the cost of stoma bag. This remains a burden for all participants for both retirees and private employees, especially those who no longer have jobs. Each participant underwent changes in economic or financial conditions, especially for participants who did not have proper jobs. Thus, it affects household finances including in terms of efforts to meet family needs. Literature said stoma patients had difficulties living with the stoma, which is an economic hardship, the cost of shopping stoma bags and other living expenses (Rangki et al., 2014).

The findings in this study are also consistent with these other studies, which have shown that economic problems can affect the quality of life of stoma patients. Coons et al. show that the cost of colostomy is an important quality in life considerations (Coons, Chongpison, Wendel, Grant, & Krouse, 2007). Nichols and Riemer (2008) have further referred the loss of work as one of the consequences of stoma.

Patients with end-stoma survive by adapting to their current state, in which patients with end-stomas in this study had various attempts to live as well as trying to make bags, avoiding odors, avoiding leaks, overcoming irritation and treating stomas. According to Roy, humans continually gain experience from their environment, so in the end a response is formed and an adaptation takes place where Roy defines adaptation as a process and outcome where individual minds and feelings use consciousness and choice to make people and environmental integration (Alligood, 2014), as well as patients with end-stoma who adapt to their condition.

According to Mota and Gomes, stoma surgery is a significant transition moment in the life of people trying to adjust to new conditions because they desire to continue to live. Stomas allow their survival and, therefore, to be viewed positively, as part of solving health problems and a second chance to live (Mota et al., 2015).

Changes in the fulfillment of sleep needs were experienced by participants. The lack of sleep restriction was experienced by participants that it is not comfortable to sleep tilting to the right or to the left for fear of stoma bags that will be crushed and will break. The participants also experienced frequent change
of bags at night so that the quality of sleeping was poor. This is in accordance with the research revealing that they cannot sleep well. They had to get up several times each night to drain the stoma bag because they were worried the bag would be too full and start leaking. Some felt constrained during sleep, as they feared a change of sleep position (Lim, Chan, & He, 2015).

Participants experienced a physical change where the time of defecation and gas (flatus) was not noticed by the participants because the stoma did not have a sphincter, so that flatus and defecate were not noticed (Williams & Hopper, 2003). Prolonged contact with the effluent may cause a reaction similar to that of a chemical burn. Adhesive picking, especially when frequently done, can lead to red skin irritation. Occasionally, allergic dermatitis may occur to adhesives. To prevent irritation, such as stomahesive, skin barrier should be used (Williams & Hopper, 2003). In addition to the irritation around the stoma, the participants also experienced stenosis where there was narrowness or shrinkage in the stoma that interfere with the drainage of the stoma. The cause of poor wound healing process was infection that occurs around the stoma, and the formation of scar tissue (WOCN, 2014).

Most participants had a hope to recover after the end-stoma although it will not be the same anymore, yet they can still do daily activities. In line with previous research stated that the expectations expressed by the respondents was to be healed and healthy as before (Erdiana, Effendy, & Pangastuti, 2007). In addition, the participants expecting to recover again also hope to have a health education related to stoma. It is important to help patients to adapt successfully to their new phase of life by providing pre- and post-operative appropriate education. Because the level of problem suffered by stoma sufferers is largely related to experience and skills in self-care, patients have the best chance to return to their regular lives if they receive further education during the transition from hospital to their home. Nurses have an important role in training and guiding patients (Richbourg, Thorpe, & Rapp, 2007).

Participants also expect a stoma association to share experiences and discussions related to stoma. According to Mota, et al. (2015) in addition to individual discussions, it is a fact that combining a support group in stoma therapy services provides people with stoma interaction with experience sharing, which facilitates self-care and shows that they are not alone in this journey. It is possible to take care of their selves and live with quality.

**CONCLUSION**

This study revealed that patients with end-stoma experience difficulties and limitations pertaining to daily living activities, including marital and social relations. Importantly, they experience psychological concerns, e.g. having negative feelings about ways of living their lives, including financial difficulties and adjusting to new ways of living. However, there is always the hope to live a normal life. This study provides an understanding of the quality of life of patients with end-stoma, allowing nurses to provide appropriate nursing care.

**Declaration of Conflicting Interest**

None declared.

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**Author Contribution**

All authors contributed equally in this study.

**References**


THE IMPACT OF HOSPITAL BASED INTEGRATED MANAGEMENT OF CHILDHOOD ILLNESS TRAINING ON PEDIATRIC NURSE COMPETENCY

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Abstract

Background: Although the WHO strategy integrated management of childhood illness (IMCI) for primary care has been implemented in over 100 countries, there is less global experience with hospital-based IMCI training. Until recently, no training had been done in Indonesia, and globally there has been limited experience of the role of IMCI in rebuilding health systems after complex emergencies.

Objective: We aimed to examine the effect of hospital-based IMCI training on pediatric nurse competency and explore the perception of Indonesian doctors, nurse managers and pediatricians about IMCI training and its development in West Aceh, a region that was severely affected by the South-Asian tsunami in December 2004.

Methods: This study used stepped wedge design. Training was conducted for 39 nurses’ staff, 13 midwives, 6 head nurses, 5 nurse managers, 5 doctors, 1 pediatrician, and 3 support facilities (nutritionist, pharmacist, laboratory) in Cut Nyak Dien (CND) Hospital in Meulaboh, West Aceh, Indonesia. The IMCI training was developed based on the WHO Pocketbook of Hospital Care for Children. A nurse’s competency questionnaire was used based on the guideline of assessment of the quality of child health services at the first level reference hospitals in districts / municipalities issued by the Ministry of Health in 2007. A linear mixed model was used for data analysis.

Results: The hospital based IMCI training improved the competences of nurses pediatric in assessing emergency signs of the sick children, management of cough and difficulty breathing, diarrhea, fever, nutritional problems, supportive care, monitoring, discharge planning and follow-up. The assessment highlighted several problems in adaptation process of material training, training process and implementation in an environment soon after a major disaster.

Conclusion: Hospital based IMCI training can be implemented in a setting after major disasters or internal conflict as part of a rebuilding process. The program requires strong management support and the emergency phase to be subsided. Other pre-requisites include the existence of standard operating procedures, adequate physical facilities and support for staff morale and well-being. Improving the quality of pediatric care requires more than just training and clinical guidelines; internal motivation and health worker support are essential.

Keywords: pediatric nurses; competencies; hospital; integrated management of childhood illness training; Aceh; IMCI
INTRODUCTION

WHO strategy integrated management of childhood illness (IMCI) for primary care has been implemented in over 100 countries. On the basis of IMCI guidelines, 10-20% of sick children seen in primary care will need referral to the first-referral level hospitals. These are the children who are most seriously ill, who will need prompt and good quality care management for their survival. In most of these hospitals’ nurses, medical assistants, or non-specialist doctors provide most of the care for seriously ill children. Observational evidence suggested there is considerable scope for improving the quality of hospital care for severely ill children in many developing countries, including in Aceh Indonesia.

Inadequate triage and assessment, poor treatment and insufficient monitoring have been identified (Haryanti, 2010) and may adversely affect the outcome of a significant proportion of hospitalized children, and result in unnecessary suffering or avoidable death for many children each year. In other settings over-hospitalization, over-diagnosis of severe illness and over-medication has adverse consequences for health outcomes and in wasted health expenditure.

In response to the problems identified above, and the potential for impact from improving hospitals, the WHO produced comprehensive guidelines for the clinical management of children in hospitals with limited resources. These guidelines extend the IMCI approach from primary care to hospital level (WHO, 2001). They are designed for use by health personal (doctors, senior nurses and other senior health workers) in first referral care (such as the district or provincial hospital), where facilities are available for inpatient and outpatient management. The WHO guidelines provide an outline of the management of the seriously ill child from the arrival to the hospital until discharge home, with appropriate plans for follow-up. The guidelines contain flow charts and tables that describe the diagnostic and treatment process. They include illustrations of practical procedures that are commonly required for the safe management of seriously ill children. The guidelines emphasize the importance of the processes or stages of care: triage, emergency treatment, history and examination, differential diagnosis, monitoring and supportive care, discharge planning and follow-up (WHO, 2005). These processes of care are relevant to all serious illnesses.

There is less global experience with hospital-based IMCI training. Until recently, no training had been done in Indonesia, and globally there has been limited experience of the role of IMCI in rebuilding health systems after complex emergencies. Trauma not only affects lab-based measures of cognitive abilities, but also impact everyday cognitive functioning. Tsunami has an impact on Cut Nyak Dhien (CND) hospital and on attitudes / willingness to adopt new practices. Thus, to inform the implementation process of hospital-based IMCI guidelines in Indonesia, this study aimed to examine the effectiveness on key competencies of pediatric nurses, and the perception of Indonesian doctors, nursing managers and pediatricians about this training in West Aceh, a region which was severely affected by the south-Asian tsunami in December 2004.

METHODS

Study design
This study used stepped wedge design (Hussey & Hughes, 2007).

Setting
This study was conducted at Cut Nyak Dhien Hospital in Meulaboh, West Aceh from August 2007 to July 2008. Several wards were used as observation sites, namely in Emergency room, Children ward, ICU, VIP class ward and Main class ward. The reason for the selection of these wards was because they provided child health services.
Sample
To evaluate nurse’s competency, we observed participants who fulfilled with the inclusion criteria: had nursing education background, nurse practitioner who gave nursing care to children in the ward, and followed original IMCI dissemination. From those criteria, there were 31 subjects chosen as follow: Emergency Room 8 nurses, Children ward 8 nurses, VIP class ward 6 nurses, Main class ward 5 nurses and ICU 4 nurses.

Intervention
The WHO Pocketbook of Hospital Care for Children and a training course based on a CD were adopted and adapted for Indonesia. We started by conducting Focus Group Discussion by doctors who trained and untrained, nurse manager, and comments from pediatricians as facilitator. The process of translation and adaptation of the WHO Pocketbook of Hospital Care for Children was carried out by a joint team involving working groups of Indonesian Pediatric Society, Indonesian MoH and WHO Indonesia. Several workshops were conducted to follow the process, particularly in regard to the adaptation process, which was required long time discussion to be fitted with local/Indonesian setting. A group of pediatricians from Gajah Mada University had been appointed by WHO Indonesia to work on translation of the CD into Indonesian version.

Once the process of translation and adaptation of the WHO Pocketbook of Hospital Care for Children done, then the training was conducted for 76 nurses and doctors in Cut Nyak Dien (CND) Hospital in Meulaboh as part of IMCI implementation in West Aceh between Gadjah Mada University, Indonesian Ministry of Health and Royal Children Hospital Australia. On June 2007, a meeting with responsible persons in CND Hospital and discussed the training plan. On July 2007, a six consecutive days meeting has been done to disseminate the concept of Integrated Management of Childhood Illness (IMCI) to 75 health staff in CND Hospital including doctors, nurses, and midwives. They were divided into 3 separate groups in which each group have been trained for two days. The nurses or midwives came from different departments in hospital based on their responsible for taking care the child health services. Some nursing staffs of the hospital have jointed the same training as well. On December 2007, a workshop followed by TOT for facilitator has been conducted in Department of Child Health Dr. Sardjito Hospital for pediatricians and nurses’ staff from Nursing School. The aim of the workshop was to review and asking for their inputs to finalize the design of training and content of training materials, before its being trialed in Aceh.

Two or three cases were covered each day. The cases included: cough or difficult breathing, diarrhea, fever and coma, infections in young infants, severe malnutrition, children with HIV/AIDS, low birth weight newborns, trauma and burn. Other important sessions were communicating the results of: assessments of the quality of care conducted in hospitals in the country (on the first morning), and discussions of participants barrier to improve the quality of care in their hospital, region or country (on the last day). Discussions of how hospitals can work together with the health system and other sectors to contribute to greater equity, child rights and community development.

The training began with self-introduction of participants and trainers. Some workshop guidelines have agreed upon by trainers and participants to make most effective use of time and to enhance the learning environment. These could include: attendance at each sessions every day, arrival on time, participation in all activities, work co-operatively and show respect for each other, complete the tasks for each given day. In the introduction trainers described the course of how it will be run and what can be achieved.

The case discussions began with a participant reading out the case history. Participants were encouraged to ask questions, and trainers alert to complex areas within cases that participants might not understand initially. Trainers
explained unfamiliar concepts in several ways where possible, and seek confirmation from participants of their understanding. Participants should be encouraged to use the Pocketbook to answer all questions during the presentation of the cases, to continually refer to these resources so they became familiar with their layout and content.

Video clips were shown during classes that illustrated specific clinical signs or procedures: Emergency and priority signs: short clinical videos (Chapter 1), Signs of serious neonatal illness: clinical photographs (Chapter 3), Respiratory case videos: bronchiolitis, asthma, etc. (Chapter 4), The diagnosis and management of wheeze (Chapter 4), Dengue fever (Chapter 6), and how to give oxygen (Chapter 10).

Practical clinical work used the WHO guidelines to work through similar problems in clinical cases on the wards. This helps reinforce knowledge and skills, thus providing an opportunity to practice developing management plans in real clinical situations, using the Pocketbook as the technical resource. Participants were encouraged to systematically work through the processes of care with each clinical case seen, and to use the Pocketbook to make a diagnosis, suggest differential diagnoses, and to decide on treatment, the type of monitoring and supportive care were required for that patient.

The participants were given an evaluation form at the end of the last session. This was anonymous and consisted of a self-administered questionnaire to know their views on the course and suggestions. Feedback from the participants was considered when further developing the implementation training.

**Instrument**

There were two instruments used in this study as the following: First, an instrument for assessing individual characteristics (including individual skills) and nurse motivation (Uno, 2008). Internal motivation dimension consisted of: the dimensions of responsibility in carrying out the task, performing tasks with clear targets, having clear and challenging goals, always trying to outperform others, having a feeling of pleasure in working, and prioritizing the achievements of what he/she does. The dimensions of external motivation consisted of: the dimension of always trying to meet the needs of life and work needs, being happy to get praise from the work, working with the hope of getting incentives, and working in the hope of getting the attention of friends. Face validity and pre-testing the instrument were performed to obtain a common understanding of the items. Cronbach’s alpha value was 0.633, which was generally acceptable.

Second was nurses competency instrument, adapted from the guideline of assessment of the quality of child health services at the first level reference hospitals in districts / municipalities (MoH, 2007). Content validity was performed with Indonesian nursing experts resulted in good category of the instrument. The dimension of nurses’ competency (94 items) included competency in cough management, fever and diarrhea management, discharge planning, emergency, nutrition, monitoring, and supportive care competency. For competence of assessing emergency and priority signs of the sick children, the focus of assessment was the ability of doing triage. While for management of cough and difficulty breathing, diarrhea, fever, and nutritional problem competence, the focus of assessment was the ability of nurses to assess, classify, and choose the best intervention based on the guidelines of IMCI hospital. For the competence of supportive care, the assessment focused on the abilities of supporting nutrition need and breastfeeding promotion. The competence of monitoring emphasized planning and recording the development of patient’s health status, while the competence of discharge planning and follow-up comprised the nurse’s ability to educate patient about the home care needed by the patient and the follow-up plans.
The assessments were done every month by three assessors. The assessment process was done by observing directly the nurses when they deliver nursing care to ill children whose the main symptom is cough and/or fever, diarrhea, and nutrition problem. The assessment process includes three aspects: knowledge, psychomotor, and affective. Overall Cronbach’s alpha value was 0.92.

**Ethical consideration**
This study was approved by the Commission of Ethics in Research, Faculty of Medicine, Universitas Gadjah Mada Indonesia. The researchers have confirmed that all participants in this study have obtained an appropriate informed consent.

**Data analysis**
A linear mixed model was used for data analysis.

**RESULTS**

There were 76 participants in this project, however; only 31 participants were being observed. (Educational background: SPK 9, D3=22; Sex: Female=22, Male=9; Married =22, Unmarried=9; Age 21-30 years = 19, 31-40 years= 21, >40 years= 1, Working experience: 1-5 years= 11, 6-10 years= 11, > 10 years= 9).

Based on quantitative measurement, the trainings have improved the eight competencies of nurse pediatrics. These are capability for assessing emergency signs of the sick children, management of cough and difficulty of breathing, diarrhea, fever, nutritional problems, supportive care, monitoring, discharge planning and follow-up. However, the most significant score is the capability of nurses to recognize the emergency and priority signs. Also, this competency had the most significant improvement per month compare with the other competencies.

From FGD, nurse managers and doctors maintain that nurse pediatrics become more aware with the emergency and priority signs. They also contend that nurses become more confidence for dealing with the patients. Furthermore, the facilitators argued that compare with other competencies, recognizing emergency and priority signs is the most important competency for nurses to be applied in the clinical practice. There was a slight improvement in nutritional problem and fever competencies because of the lack of supporting equipment such as thermometer and the broken scale measurements, etc.

Furthermore, the participant reported the lacks of motivation since there was no supervision for providing the support and giving the sufficient feedback. Likewise, the nurse managers also reported that they had not given enough supervision since they did not really understand the procedure to provide the sufficient assistance. The lack of reward and unrewarded system also contributed to the compliance of nurses. They only applied the knowledge under supervision not improved their daily performance.

Figure 1 shows the observations on the competence of nurses in assessing signs of childhood sickness, cough management and difficulty breathing, diarrhea management, fever management, and malnutrition management. While Figure 2 shows the observation of the nurse's competence in performing supportive care, monitoring the pediatric patient, and preparing the patient for home and follow-up after care.
Figure 1 Observation results of the pediatric nurses’ competencies

Figure 2 Observation result of pediatrics nurses’ competencies

Note:
Gawat = assessing emergency signs of the sick children
Batuk = management of cough and difficulty breathing
Diare = diarrhea
Demam = fever
Gizi buruk = nutritional problems
Sup. Care = supportive care
Monitoring = monitoring
Disc plan = discharge planning and follow-up
n= the total number of observations made from December 2007 to June 2008. The assessment of this competency was performed by the nurses themselves (self), peers and nurses' supervisors.
DISCUSSION

This assessment was designed as a starting point for improving the quality of child health services, especially in district hospital in West Aceh post disaster and internal conflict. The assessment highlighted several problems in clinical care, human resources, health financing, referral systems and ongoing education and training. Studies in other developing countries have highlighted similar problems in pediatric care (Auto, Nasi, Ogaoga, Kelly, & Duke, 2006; English et al., 2004; Nolan et al., 2001). This current study and the initiatives that have followed it demonstrate the link between such assessment, child health policy and quality improvement activities.

As well as the multiple problems, the study identified many undoubted strengths of the health service, most notably the commitment of nurses. There were many instances where nurses worked without pay for weeks or months, or worked night shifts in a hospital when they had also been on throughout the day. Most nurses worked in unsupported environments and with inadequate resources, and most had received no training in child health after graduation, despite many being solely responsible for pediatric care in their hospital.

There is major shortage of skilled child health nurses. Most nurses felt insufficiently skilled to manage many of illnesses they were seeing, and all reported there was an urgent need ongoing training in child health. Ideally, there should be at least one skilled child health nurse in every large health center and several in each hospital. It is logistically difficult and costly to train large numbers of nurses in postgraduate course. Developing a national postgraduate course in child health nursing is the longer-term solution this problem. Ideally, this would be a combined midwifery and child health course emphasizing the inseparable association between maternal and child health. There would need to be accompanying recognition of the qualification and incentive to work.

There will need to be a substantial and ongoing investment in hospital infrastructure and services, with basic maintenance of buildings and equipment, and funding for essential utilities. An effective referral system should be supported by better communication between health facilities.

These interventions of training for nurses and doctors, provincial supervision, introduction of standardized evidence-based treatment, auditing outcomes, a single balanced child health plan and a structure for overall management and review will be important for CND hospital if it is to achieve the MDG for child survival 2015. It is important for providing supervision and the availability of the standard operational procedure as the adequate legal aspect for nurses.

CONCLUSION

Hospital based IMCI training can be implemented in a setting after major disasters or internal conflict as part of a rebuilding process. The program requires strong management support and the emergency phase to be subsided. Other pre-requisites include the existence of standard operating procedures, adequate physical facilities and support for staff morale and well-being. Improving the quality of pediatric care requires more than just training and clinical guidelines, internal motivation and health worker support are essential.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.
References


LETTER TO THE EDITOR

MEN, MASCULINITIES AND HIV/AIDS IN INDONESIA

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Dear Editor,
Globally, there are 36.7 million people living with HIV/AIDS (PLWHA), with 34.5 millions of adults and 2.1 millions of children under 15 years (UNAIDS, 2017). In Indonesia, PLWHA in 2016 amounted to 785,821, while the estimated number of new infections was 90,915 (MOH, 2014).

It is noteworthy that that the trend of PLWHA has shifted from female sex workers to housewives, which is the first rank of PLWHA amounted to 279,276 with new HIV infection of 25,592 cases, and then followed by men with low risk (155,477 cases), homosexual (153,771 cases), and drug users (21,559 cases) (MOH, 2017).

Ironically, women, especially housewives, play a critical role in the appraisal and maintenance of the hegemonic behavior of men, husbands in this case, despite the fact that they are often subordinated by them (Talbot & Quayle, 2010). It is assumed that men in the context of HIV and AIDS in Indonesia are typically positioned as being central to the spread of HIV transmission.

Men shape many of the attitudes and behaviors that fuel the HIV epidemic. These include multiple sexual partners, low or non-use of condoms, and homophobic attitudes. The masculinity that encourage multiple sexual partners also support the idea that male sexuality is “uncontrollable” and “spontaneous” (Betron, Barker, Contreras, & Peacock, 2012). One expression of this is that hegemonic masculinity is often constructed around and through sexual conquest and the desirability and number of sexual partners may be an important indicator of masculinity; and that use of a condom can decrease a man’s sexual pleasure (Simpson, 2007).

Connell & Connell (2005) defines hegemonic masculinity as the enactment of an idealized form of masculinity (being 'the real man') in a particular time and place. In many context, men’s enactment of social constructed versions of manhood can also have a subordinating role, by preventing them from taking advantage of life-saving HIV services (Connell & Connell, 2005). A growing number of studies highlight men's unwillingness or reluctance to seek health services (Skovdal et al., 2011). It is therefore further studies to determine the factors that prevent men from engaging with health services are suggested.

In considering how dominant constructions of masculinity contributes to HIV/AIDS, male-

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friendly HIV prevention strategies should be provided. HIV preventive program focuses on not only changing predominant gender norms, but also addressing the cultural traditions associated with male health seeking behaviors. The strategies include: HIV/AIDS couple VCT (Voluntary Counseling and Testing) in male-friendly and accessible settings, training and support for service providers and counselors to address male-specific sexual and reproductive health needs (Betron et al., 2012).

Additionally, as stigma and discrimination in Indonesia is still high, peer education is very important, especially in reaching the most vulnerable groups of men and in developing acceptance and trust among such groups; and the most important is to create safe spaces for men to discuss issues of male sexuality, sexual identity and gender equality (Betron et al., 2012).

Lastly, we emphasize the concept of masculinity that a real man should be strong, in control, and be the producer of his family. Men are expected to play an active role in continually demonstrating their manhood.

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Author Contribution
Both authors contributed equally in this study.

References
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EFFECT OF NATURE SOUND THERAPY ON THE LEVEL OF CORTISOL IN POSTPARTUM PRIMIPARA

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Abstract

Background: Majority of primiparous mothers experience a wide range of postpartum blues, which leads to stress and an increase in cortisol. Therefore, efforts to reduce cortisol level is needed. Nature sound music therapy is believed to make the mothers feel relaxed and comfortable.

Objective: To examine the effect of the nature music therapy on cortisol levels in postpartum primipara.

Methods: This was a true experimental study with pretest-posttest control group design. The study was conducted in the postpartum ward in the General Hospital of Semarang Indonesia from November 2016 to January 2017. There were 39 postpartum primipara selected in this study using simple random sampling divided into three groups: 1) the experiment group who received the nature music therapy for 15 minutes, 2) the experiment group who received the nature music therapy for 30 minutes, and 3) the control group. One-way ANOVA test was performed for data analysis.

Results: There was a statistically significant effect of the nature sound therapy on the cortisol level in the postpartum primipara, with p-value = 0.010 (<0.05).

Conclusion: There was a significant effect of the nature music therapy on the cortisol levels in postpartum primipara. Thus, the application of nature music therapy can be an alternative therapy especially for postpartum primipara who experience emotional stress, physical, anxiety, and fatigue.

Keywords: nature sound therapy; cortisol levels; postpartum; primipara

INTRODUCTION

Postpartum period can be a difficult time for many women and they may experience a wide range of postpartum problems. One of the common problems is postpartum stress (Marshall, 2004). The incidence of postpartum stress in Indonesia is 50-70% from several studies that have been done in several places in Jakarta, Yogyakarta and Surabaya (Miyansaski, 2014). Most of them are primipara with moderate stress 66.7% (Jayasima, Deliana, & Mabruri, 2014). Based on previous research, primiparous postpartum mothers have high stress and cortisol compared with multiparas (Grajeda & Pérez-Escamilla, 2002).
Stressful body condition however may trigger the hypothalamus (anterior pituitary pituitary) in increasing cortisol and the secretion of adrenocorticotropic hormone (ACTH). Cortisol is released into the bloodstream through the activation of the pituitary-pituitary-adrenal (HPA) system. Stress conditions and cortisol levels have a strong association so that cortisol is assumed as a stress biomarker, representing HPA system activity (Greenstein & Wood, 2010).

Under normal circumstances, stress hormones are released in small amounts throughout the day, but when faced with stress, hormone levels are increased. Any type of body response in the form of stress, both physical stress and psychic stress can increase ACTH secretion which in turn can increase cortisol levels. In anxiety and depression condition, cortisol secretion increases (Gunawan, 2007). ACTH stimulates glucocorticoid release. When the body is under stress for a long time, fatigue will occur and is characterized by muscle wasting, immune system atrophy, gastric ulcers, and vascular damage. Thus, an effort is needed to decrease the level of cortisol (Greenstein & Wood, 2010).

Listening to music is considered effective to decrease stress hormone. Music causes changes in brain wave status and also affects the cardiovascular system, and respiration (Halim, 2002; Stiller, 2007). A nature sound music is music that has a slow tempo, with low tones and no lyrics that can cause feelings relaxed and comfortable (Jayasima et al., 2014). Listening to the music can increase the frequency in the alpha rhythm section and the larger (coherent) equations between different regions of the cerebral cortex, most commonly in the frontal lobes. The activation of right frontal lobe then causes decreased cortisol and ACTH hormone until the normal range (Stiller, 2007).

Therefore, with the benefits of natural sound therapy, this study aimed to examine the effect of nature sound therapy on the level of cortisol in postpartum primipara.

METHODS

Study design
This was a true experimental study with pretest-posttest control group design. This research was conducted in the postpartum ward in the General Hospital of Semarang from November 2016 to January 2017.

Population and sample
There were 39 postpartum primipara recruited in this study using simple random sampling divided into three groups: 1) the experiment group who received the nature music therapy for 15 minutes, 2) the experiment group who received the nature music therapy for 30 minutes, and 3) the control group. The random assignment was done by giving a close envelope to each participant. The envelop contained the code number indicating the group. The inclusion criteria of the sample included: 1) postpartum primipara (the 3rd day after delivery) with the reason to consider the stability of maternal health and adaptability to their new role as mother and in the phase of taking hold, 2) normal delivery, 3) mother and baby were in healthy condition, 4) not taking any medications that can lower blood pressure and anti-analgesic drugs and drugs containing gluco-steroids, and 5) willing to be a respondent and could communicate actively. While the exclusion criteria included mothers who were suffering from serious illness (diabetes mellitus, cancer).

Intervention
The nature music therapy used in this study was the music created by Kevin McLeod entitled “3 hours relaxing music with water sounds meditation”, with volume 50 at sound pressure of 52 dB. The intervention was given for 15 minutes for experiment group I and 30 minutes for experiment group II. The intervention was administered on the 3rd day of postpartum period once daily for 2 days and also received standard nursing care services for normal postpartum. The intervention was given by the researcher. While control group only received standard nursing care services.
**Instrument**

Laboratory test was performed to measure cortisol levels using saliva specimens for 2 days on the 3rd and 4th days of the postpartum period. Data on specimen yields of cortisol content obtained from the laboratory of each respondent were noted on the observation sheet and collected for tabulation. Normal value of cortisol 1.2 – 14.7 ng/mL (Greenstein & Wood, 2010). Saliva is an appropriate medium for measuring steroids because it is a natural ultra-filtrate of blood, and the steroids were not bound by the carrier proteins in free blood diffuse into the saliva.

**Ethical consideration**

The study has obtained an ethical approval from Health Research Ethics Committee (K.E.P.K) with the code number: 213 / KE PK / Poltekkes-SMG / EC / 2016. The researchers have confirmed that each respondent has obtained an appropriate informed consent.

**Data analysis**

Data were analyzed using One-way ANOVA.

### RESULTS

Table 1 shows that the average of cortisol level before the intervention in the group I was 7.46 ng/mL, and after given intervention cortisol decreased to 5.32 ng/mL (2.14 ng/mL difference between pretest-posttest). While the average of cortisol level before the intervention in the group II was 8.79 ng/mL, and after given intervention cortisol level was 6.31 ng/mL, with mean difference of 2.48 ng/mL. In the control group, the mean of cortisol level before intervention was 4.63 ng/mL and after intervention was 6.22 ng/mL. There was a mean difference of 1.59 ng/mL.

Paired t-test showed p-value 0.007 in the group I, and p-value 0.006 (<0.05) in the group II. It is indicated that there was a statistically significant difference of cortisol level before and after given intervention. While there was no significant difference of cortisol level in the control group before and after given intervention with p-value 0.578 (>0.05).

### DISCUSSION

Findings of this study revealed that there was a significant influence of the nature sound therapy and the cortisol level. In addition, there was also a significant difference of cortisol level between the 15 min and 30 min
interventions. This study is consistent with Khalfia's study indicated that there was a significant decrease of salivary cortisol and stress compared with control group (Khalfa, Bella, Roy, Peretz, & Lupien, 2003). Supported by Linnemann revealed that there was a decrease of cortisol levels and stress in daily day after listening to relaxation music (Linnemann, Ditzen, Strahler, Doerr, & Nater, 2015).

Music therapy can provide physiological or biological effects on a person by stimulation of some rhythm. The music can decrease the cortisol (stress hormone), which can contribute to blood pressure, and can improve the function of the inner lining of blood vessels that cause vasodilating blood vessels by 30% (Bobak, Lowdermilk, & Jensen, 2005). The natural sound music therapy was received by the ear and captured by the tympanic membrane. In interconnected hearing bones (meleus, incus and stepes) produce vibrations of mechanical impulses and then transformed into electrical impulses and sent to the branches of nerve VII (Cochlearia vestibule) to be transmitted to the brainstem thalamus, so that the mother becomes relaxed by giving positive results of heart rate and breathing rate is more stable and reduce stress levels (Campbell, 2001).

Nature music therapy is one of the distractions to give a good effect for a short period of time, which can reduce physiological pain, anxiety and stress. Music therapy is a therapeutic technique that is easy to implement and affordable. In addition, music causes changes in the brain wave status and stress hormone patients (Halim, 2002; Potter & Perry, 2005).

**Limitations**

Matching had not been done in each group that might be the limitation of the study.

**CONCLUSION**

There was a significant effect of the nature music therapy on the cortisol levels in postpartum primipara. Thus, the application of nature music therapy can be an alternative therapy especially for postpartum primipara who experience emotional stress, physical, anxiety, and fatigue.

**Declaration of Conflicting Interest**
None declared.

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**Author Contribution**
All authors contributed equally in this study.

**References**


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RELATIONSHIP BETWEEN QUALITY OF CARE OF YOUNG MOTHERS AND SOCIAL-EMOTIONAL DEVELOPMENT IN PRESCHOOL CHILDREN

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Abstract

Background: Social-emotional development in preschooler children is an important component in child development, as it becomes the foundation in preparing children for confidence, empathy and intellect, building trust, and being able to use language in communication and connect with others. One of the factors that affect children's emotional social development is the quality of mother's care. Children of young mothers have risks in emotional and intellectual social problems in children.

Objective: The purpose of the study was to determine the relationship of quality care of young mothers with social-emotional development in preschool children in the working area of the Health Center of Kemalang, Klaten Regency, Indonesia.

Methods: This was a correlational analytic research with cross sectional design. The sample of the study was 124 young mothers with preschool children selected using consecutive sampling technique. The study was conducted from July to August 2017 at six kindergarten schools in the working area of the Health Center of Kemalang, Klaten Regency. Data were collected using parent behavior questionnaire and stage social-emotional instrument. Data were analyzed using chi square test.

Results: Findings showed that 58.1% of young mothers had good quality of care, and 55.6% of preschoolers were at risk of developing emotional social development problems. There was a significant correlation between the quality of care of young mothers with social-emotional development in preschool children (p-value <0.05).

Conclusion: There was a correlation between the quality of care of young mothers with social-emotional development in preschool children.

Keywords: quality of care; young mothers; social-emotional development; preschooler

INTRODUCTION

The first five years of life in children are the golden period, the window of opportunity and the critical period (Depkes, 2010). Therefore, the period is important in a child's life because of rapid growth and brain development, the development of language skills, social, emotion and movement (MoH, 2010). In early childhood, in addition to physical and cognitive development, there is social and emotional development (Schwartz, 2011).
social and emotional development of preschooler children is an important component in the development of children for social relationships with peers (Jucan & Simion, 2015).

A child must have emotional social skills so that children can achieve basic skills such as collaboration, showing self-control and attention. Conversely, incapacity in social and emotional skills in children can cause problems in relationships with families, schools and communities (Darling-Churchill & Lippman, 2016). In Turkey, there are 9.3% of children found to have social-emotional problems (Karabekiroglu et al., 2013). Approximately 8 to 9% of preschoolers in the Netherlands experience psychosocial problems, especially emotional social problems such as anxiety or aggressive behavior (Klein Velderman, Crone, Wiefferink, & Reijneveld, 2009). The impact of emotional social development problems in early childhood may pose a psychosocial problem such as depression, loneliness, drug use and crime when become adults (Bor, McGee, Hayatbakhsh, Dean, & Najman, 2010; Mordre, Groholt, Kjelsberg, Sandstad, & Myhre, 2011; Segrin & Flora, 2000; Stevenson & Goodman, 2001).

An important indicator in emotional social development in children is social competence (Denham et al., 2003). Social competence is the ability to maintain social relationships in the process of interaction through positive behavior (Parhomenko, 2014). Through interaction, children can learn the skills they need to engage with others and succeed in different environments (Rogoff, 2003). Interaction can help the child to develop a sense of self and emotional expression as well as emotional regulatory skills such as self-calming and self-control skills (Tronick & Beeghly, 2011). Parents have a role in social development (Healy, Sanders, & Iyer, 2015) and future academic success in children (Cook, Roggman, & Boyce, 2011). Therefore, parents should provide social stimulation in children (Hedenbro & Rydelius, 2014).

One of the factors that influence the problem of emotional social behavior is mother's care (Stein, Malmberg, Leach, Barnes, & Sylva, 2013). Meanwhile, parents, especially young mothers, are one of the major risk factors associated with early childhood development (Institute, 2011). The results of Sommer et al. shows that children of young mothers are at risk in emotional and intellectual social problems in children (Sommer, Whitman, Borkowski, & Gondoli, 2000). The results of Ryan-Krause et al. shows that nearly 20% of children from young mothers are at risk of having a delay in development (Ryan-Krause, Meadows-Oliver, Sadler, & Swartz, 2009). The nurture provided by young mothers to children tends to be less optimal when compared to older mothers because young mothers are less responsive, lacking in stimulation, and lacking support in child development (Thullen, 2011).

In addition, the lack of skills and knowledge of young mothers in the development of children can affect the practice of parenting so that it can cause feelings of frustration or disappointment to the achievement of child development (Ryan-Krause et al., 2009). On the other hand, research on the emotional social development in preschool children that correlates with the quality of care of young mothers has never existed, thus the aim of this study was to determine the relationship of quality care of young mothers with emotional social development in preschool children in in the working area of the Health Center of Kemalang, Klaten Regency.

**METHODS**

**Study design**

This was a correlational analytic research with cross sectional design to analyze the relationship of the quality of care of young mother with social-emotional development in preschool children.

**Sample**

The population in this study was all preschool children with 211 young mothers in the
working area of the Health Center of Kemalang, Klaten Regency, Indonesia. The method of determining the number of samples was by consecutive sampling technique, and obtained a sample size of 124 young mothers with preschool children. The inclusion criteria were: preschool aged 3-5 years, young mothers aged 12-24 years and willing to participate in the research proved by signing the informed consent form. The exclusion criteria were preschool children with developmental disorders such as mental retardation, autism cerebral palsy and mothers with severe mental illness.

**Instruments**

The instrument used in this study was a questionnaire about the characteristics of the respondents consisting of children age and gender, mother's age, marital status, type of works, education level, presence of a baby sitter, number of children and mental status of the mother. Instrument for measuring mental status was a Beck Depression Inventory II (BDI II) questionnaire. The quality of maternal care was measured using the Parent Behavior Questionnaire (PBQ) instrument adopted from Haryati (2010) and Nadhirroh (2008). The mother’s care scale is based on aspects of bonding, discipline, educational behavior, clothing, food and general protection, maternal responsiveness and mother's sensitivity. The social-emotional development was measured using the Age and Stage Social Emotional (ASQ:SE) instrument consisting of 35 questions for children aged 36 months, and 36 questions for children aged 48 months and 60 months. ASQ:SE consisted of personal and social elements including self-regulation, compliance, communication, adaptive function, autonomy, affection, and interaction with people. Parent Behavior Questionnaire and Age and Stage Social Emotional questionnaire have been tested for validity and reliability and stated the results were valid and reliable. Data collection in this study was conducted by distributing questionnaires to respondents i.e. young mothers who have preschool children who attend kindergarten in the working area of Community Health Center of Kemalang. In this study, the researchers were assisted by the research assistant to distribute and collect the questionnaire that has been filled by the respondents.

**Data analysis**

The univariate analysis was conducted to describe the characteristics of the respondents including the age and sex of the children, the mother's age, education, type of work, marital status, the presence of caregiver, number of children and mental status of the mother. Bivariate analysis was done to get significance value of the relation between quality of care of young mother with social-emotional development in preschool children and to identify factors influencing quality of care and social-emotional development. Bivariate analysis used chi square test.

**RESULTS**

Table 1 presents data on the characteristics of respondents with an average age of the children was 3.98 + 0.721 and the majority of children were female (52.4%). The average age of the mother was 19.58 + 1.59 and most mothers were housewives or unemployed (96.8%). Of 71.8% of the mothers were educated and 99.2% were married. It was 88.7% of mothers caring their children by themselves, 75.8% of them had one child, and 78.2% had a normal mental status.

Table 2 shows that most of the respondents (58.1%) showed the quality of mother care was in the good category. And Table 3 shows that 69 children (55.6%) were at risk of having social emotional development problems.

While the results of data analysis in the Table 4 showed that the quality of care only has a significant relationship with mother’s age variable with p-value 0.041, while the social-emotional development in preschool children was influenced by the age variable of the mother (p-value 0.047) and the number of children (p-value 0.005).
Table 1 Frequency distribution of the Characteristics of the Respondents (n= 124)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>f</th>
<th>%</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s age (Year)</td>
<td></td>
<td></td>
<td>3.98 ± 0.721</td>
</tr>
<tr>
<td>3 year</td>
<td>33</td>
<td>26.6</td>
<td></td>
</tr>
<tr>
<td>4 year</td>
<td>60</td>
<td>48.4</td>
<td></td>
</tr>
<tr>
<td>5 year</td>
<td>31</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Child’s gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boy</td>
<td>59</td>
<td>47.6</td>
<td></td>
</tr>
<tr>
<td>Girl</td>
<td>65</td>
<td>52.4</td>
<td></td>
</tr>
<tr>
<td>Mother’s age</td>
<td></td>
<td></td>
<td>19.71±1.67</td>
</tr>
<tr>
<td>≤ 20 year</td>
<td>92</td>
<td>74.2</td>
<td></td>
</tr>
<tr>
<td>&gt; 20 year</td>
<td>32</td>
<td>25.8</td>
<td></td>
</tr>
<tr>
<td>Mother’s education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (Senior high school, Diploma)</td>
<td>35</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td>Low (Elementary, Junior high school)</td>
<td>89</td>
<td>71.8</td>
<td></td>
</tr>
<tr>
<td>Mother’s employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>120</td>
<td>96.8</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>4</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>123</td>
<td>99.2</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>1</td>
<td>0.8</td>
<td></td>
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<tr>
<td>Caregiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>110</td>
<td>88.7</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td>Number of children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>94</td>
<td>75.8</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>24.2</td>
<td></td>
</tr>
<tr>
<td>Mental status of mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>97</td>
<td>78.2</td>
<td></td>
</tr>
<tr>
<td>Mild depression</td>
<td>26</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Moderate depression</td>
<td>1</td>
<td>0.8</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 Frequency distribution of care quality of young mothers (n= 124)

<table>
<thead>
<tr>
<th>Care Quality</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>72</td>
<td>58.1</td>
</tr>
<tr>
<td>Poor</td>
<td>52</td>
<td>41.9</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3 Frequency distribution of social-emotional development of Children (n= 124)

<table>
<thead>
<tr>
<th>Social Emotional Development</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No risk of emotional social problems</td>
<td>55</td>
<td>44.4</td>
</tr>
<tr>
<td>At risk of emotional social problems</td>
<td>69</td>
<td>55.6</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 4 Different testing of the quality of care of young mothers and social-emotional development of children

<table>
<thead>
<tr>
<th>Variable</th>
<th>Care quality of young mothers</th>
<th>Social-emotional development</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good (f (%))</td>
<td>Poor (f (%))</td>
<td>p-value</td>
</tr>
<tr>
<td><strong>Mother’s age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 20 years</td>
<td>46 (37.1)</td>
<td>42 (33.87)</td>
<td>0.041*</td>
</tr>
<tr>
<td>&gt; 20 years</td>
<td>26 (20.96)</td>
<td>10 (8.07)</td>
<td></td>
</tr>
<tr>
<td><strong>Mother’s education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (Senior high school, Diploma)</td>
<td>22 (17.74)</td>
<td>13 (10.48)</td>
<td>0.498</td>
</tr>
<tr>
<td>Low (Elementary, Junior high school)</td>
<td>50 (40.32)</td>
<td>39 (31.45)</td>
<td></td>
</tr>
<tr>
<td><strong>Mother’s employment status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>68 (54.84)</td>
<td>52 (41.93)</td>
<td>0.139</td>
</tr>
<tr>
<td>Employed</td>
<td>4 (3.23)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>72 (58.07)</td>
<td>51 (41.13)</td>
<td>0.419</td>
</tr>
<tr>
<td>Widow</td>
<td>0 (0)</td>
<td>1 (0.80)</td>
<td></td>
</tr>
<tr>
<td><strong>The presence of caregiver</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>64 (51.62)</td>
<td>46 (37.09)</td>
<td>0.941</td>
</tr>
<tr>
<td>Yes</td>
<td>8 (6.45)</td>
<td>6 (4.84)</td>
<td></td>
</tr>
<tr>
<td><strong>Number of children</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>55 (44.36)</td>
<td>39 (31.45)</td>
<td>0.859</td>
</tr>
<tr>
<td>2</td>
<td>17 (13.71)</td>
<td>13 (10.48)</td>
<td></td>
</tr>
<tr>
<td><strong>Mental status of mothers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>57 (45.97)</td>
<td>40 (32.26)</td>
<td>0.602</td>
</tr>
<tr>
<td>Mild depression</td>
<td>15 (12.1)</td>
<td>11 (8.87)</td>
<td></td>
</tr>
<tr>
<td>Moderate depression</td>
<td>0 (0.0)</td>
<td>1 (0.80)</td>
<td></td>
</tr>
</tbody>
</table>

Table 5 shows that 33.8% of children were at risk and 8.1% had no risk of social emotional development problem with poor care quality of young mothers, while with good quality care of young mothers there were 21.8% of children were at risk and 36.3% had no risk of social-emotional development problem. Statistical test obtained significance value of 0.000 (p<0.05), which indicated that there was a significant relationship between the care quality of young mothers with social-emotional development in preschoolers. An odd ratio of 0.143 indicates that a child raised by a young mother with poor quality of care had a probability of 0.143 times at risk of having an emotional social problem compared with a child receiving good quality care of a young mothers, with minimum risk of 0.062 to 0.330 times.

Table 5 Relationship between the care quality of young mothers and social-emotional development of children using Chi-Square test (n=124)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Social Emotional Development</th>
<th>p</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care quality of young mothers</td>
<td>At risk</td>
<td>No risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>27 (21.8%)</td>
<td>45 (36.3%)</td>
<td>0.000*</td>
<td>0.143</td>
</tr>
<tr>
<td>Poor</td>
<td>42 (33.8%)</td>
<td>10 (8.1%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant (p-value < 0.05)

DISCUSSION

The result showed that there was a correlation between the quality of care of the young mother and the social-emotional development in preschool children in Kemalang Klaten Health Center. This is because the quality of care of young mothers plays a role in
determining the social-emotional development of children. The quality of good care will improve the emotional social development of children in accordance with the age of the child. If the quality of care of young mothers is not good then it will also affect the development of children where the development is low or not appropriate with the age of the child.

The results of this study were in line with the research of Blandon et al. who states that the quality of care significantly affects social and emotional development in children. Quality care is one way to develop emotional cognitive and social abilities in preschoolers (Blandon, Calkins, & Keane, 2010). This is also supported by Broekhuizen et al. who stated that the quality of care is related to children's social-emotional development (Broekhuizen, Aken, Dubas, & Leseman, 2017). It is indicated that preschool age children need guidance and help of parents, especially mothers in helping children socialize, manage emotions and reduce the occurrence of failure when doing activities that will affect their social-emotional development (Radesky et al., 2014).

The results also showed that the majority of young mothers in this study had good quality care. Although the respondents in this study were young mothers but most respondents got high scores in each domain. The higher the obtained value, the better the quality of care of young mothers. Good care quality in which responsive, sensitive and stimulating can have an impact on cognitive and linguistic development, positive peer relationships, adherence to adults, mother-child relationships and social relationships. If the mother provides a less sensitive and responsive treatment then the child will receive low quality care (Owen, 2011).

The results of statistical tests showed that the factor that affects the quality of care of young mothers was the age of the mother. The variable of mother’s education, employment status, mental status, number of children, marital status and the presence of caregiver were not related to the quality of care of young mother. Mother’s age plays a role in parenting and developmental practices in children (Bornstein, Putnick, Suwalsky, & Gini, 2006). According to WHO the quality of interaction is influenced by the age of mothers. Older mothers become more responsive to children than younger mothers. Mothers who have previous experience in caring for children have better interaction quality compared to mothers who have first child (WHO, 2004).

The results of this study also showed that most children were at risk of developing social-emotional development problems. According to Hurlock, it is stated that the child in childhood period is in the process of developing a unique personality and demands freedom that is generally less successful. Preschoolers are often stubborn, disobedient, resistant, often angry for no reason, aggressive, powerful behavior, selfish and destructive behavior (Elizabeth B. Hurlock, 2003), so preschoolers may be at risk of emotional social problems (Brown, Copeland, Sucharew, & Kahn, 2012). The social and emotional development of preschoolers is an important milestone in overall development. Aspects of social and emotional competence can be related to many of the positive developmental traits found in children, including higher levels of language development and communication skills (Hartas, 2011).

In this study, factors affecting the emotional social development of preschoolers were the age of the mother and the number of children. This may be because of the child being treated by a young mother is at risk of developing social-emotional problems due to a lack of mother's knowledge and skills in stimulating child development. According to Notoatmodjo, knowledge is closely related to age. The older of the age of a person, the more mature of the way of thinking (Soekidjo, 2010). Perry et al. states that young mothers can provide physical care, warmth and attention to children, but lack in verbal interactions compared to adult mothers.
Young mothers tend to be less responsive and lack interaction. Compared with adult mothers, young mothers have limited knowledge of child development (Perry, Hockenberry, Lowdermilk, & Wilson, 2017).

In regards to the number of children that also affected the emotional social development of children in this study, according to Hurlock, the jealousy, competition, quarrel between siblings will be felt by all parents who have two or more children, which will affect the child’s development (Elizabeth Bergner Hurlock, 1978). Najman et al. stated that the magnitude of the family affects the quality of care of mothes, which also impacts to the social development of children (Najman, Bor, Andersen, O'Callaghan, & Williams, 2000). Previous research results stated there is a meaningful relationship between mother's age with child social maturity (Ismail, 2010), supported by the results of Haryati's research indicate that there is a significant relationship between the number of children with the social development of preschool children (Haryati & Djauhar, 2010).

CONCLUSION

Based on the results of the study, it can be concluded that the majority of the quality of care of young mothers were in good category, with some preschool children were at risk of social-emotional development problems. There was a significant relationship of quality care of young mothers with social-emotional development in preschool children in the working area of the Health Center of Kemalang, Klaten regency, Indonesia.

Declaration of Conflicting Interest

None declared.

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Author Contribution

All authors contributed equally in this study.

References


being bullied at school. Journal of Child and Family Studies, 2(1), 127-140.
EFFECT OF HYPNO-PRESSURE ON ANXIETY IN PATIENTS WITH CARDIOVASCULAR DISORDER

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Abstract
Objective: This study aimed to determine the effectiveness of the combination of hypnotherapy and acupressure (hypno-pressure) on anxiety levels in patients with cardiovascular disorders.
Methods: A quasi-experimental research with pretest-posttest with control group design was used. Fifty-six respondents were selected using purposive sampling in this study, which 28 respondents were randomly assigned in the experiment and control group. The Spielberger State-Trait Anxiety Inventory (STAI) Form Y was used to measure anxiety. Paired t-test and Independent t-test were used for data analysis.
Results: There was a significant effect of hypno-pressure on the decrease of anxiety levels in patients with cardiovascular disorder with p-value 0.000 (<0.05), t = 7.217, and effect size of 1.96.
Conclusion: Hypno-pressure could reduce anxiety levels in patients with cardiovascular disorder.

Keywords: anxiety; cardiovascular disorders; hypnosis; acupressure

INTRODUCTION

Based on the Basic Health Research of the Department of Health of the Republic of Indonesia in 2013 stated that the percentage of patients with cardiovascular disorders always increase every year, from 7.1% in 2010 increased to 9.0% in 2011, 9.3% in 2012, and 9.8% in 2013 (MOH, 2013).

Cardiovascular disorders and anxiety are the two variables that have a causality relationship, which become a serious problem to the patient's prognosis. Anxiety disorders adversely affect cardiovascular disorders, 35% of 492 patients have an increased risk of hospitalization (Chamberlain et al., 2011; Tully & Baune, 2014; Tully, Cosh, & Baune, 2013). Anxiety affects the biological process of cardiovascular function in patients with heart failure by altering neurohormonal function through the activation of the hypothalamic-pituitary-adrenal (HPA-axis) (Bahall, 2015; Kreitzer & Snyder, 2002).

Anxiety is a risk factor for cardiovascular disorders and otherwise cardiovascular disorders will cause anxiety. This condition will be a serious problem to the patient's prognosis (DeJong, 2005). Thus, an effort to reduce anxiety in patients with cardiovascular disorder is needed.

Hypnosis is an independent nursing intervention, used to achieve relaxation, reduce anxiety, fear and discomfort by
manipulating the mindset (Dufresne et al., 2010; Hammond, 2010; La Kahija, 2007). Besides, acupressure is a technique of emphasis, massage and or sequencing along the body's meridian lines which allows a congested flow of energy to rise to a healthier state, resulting in physiological changes of the body (Pilkington, Kirkwood, Rampes, Cummings, & Richardson, 2007; Stux & Pomeranz, 2012; Sukanta, 2008). Research conducted by previous research proves that hypnosis and acupressure interventions can reduce anxiety in various cases, but the intervention was done separately. However, previous studies mentioned that there was no strong relationship between hypnosis and anxiety (Vorizal, 2010), and between acupressure and anxiety (Beikmoradi et al., 2015).

Hypnosis and acupressure are independent nursing interventions that can be done by trained and certified nurses. Hypnosis and acupressure can be used to treat various signs and symptoms raised by a disease or health problem, including anxiety that arises in patients with cardiovascular disorders (Butcher, Bulechek, Dochterman, & Wagner, 2018). Furthermore, hypnosis and acupressure can be performed simultaneously called hypno-pressure. This study aimed to determine the effect of hypno-pressure on anxiety levels in patients with cardiovascular disorders scientifically.

METHODS

Study design
This was a quasi-experimental study with pretest-posttest control group design. This study was conducted from 5 December 2016 to 15 January 2017.

Sample
Fifty-six respondents were selected using purposive sampling in this study, which 28 respondents were randomly assigned in the experiment and control group.

Instrument
The Spielberger State-Trait Anxiety Inventory (STAI) Form Y was used to measure anxiety in this study. This instrument has been adapted into 48 languages for a wide range of studies in health research. This instrument has also been translated in Indonesian language by previous research (Itsna, 2016).

Intervention
Hypno-pressure interventions conducted by trained nurses who have been certified to perform hypno-pressure, and trained in the management of patients with cardiovascular disorders. The certificates and courses that the authors have for the purpose of conducting this research were certified hypnotist (CH) and certified hypnotherapist (CHt) published by The Indonesian Board of Hypnotherapy, International Short Course Training on Clinical Practice in Critical Care Program Unit at Faculty of Nursing Prince of Songkla University Thailand, Critical Care Nursing and Academic Activity Experience Exchanging at Boromarajonani College of Nursing Yala Thailand. Elderly patients were one of the challenges of the researcher during therapy, so researchers needed to find a veryquire room, done the therapy with a clear voice, slowly, with the help of soft instrumental music. The implementation of this study began with a pretest of intervention and control groups by measuring the anxiety levels of both groups when patients entered the ICCU using the STAI form Y instrument, the results were documented. The following day at 08.00-09.00 for the experiment group was given the first treatment with hypno-pressure for 30 minutes. The second treatment was done at 10:30 to 11:30 with 30 minutes. The control group was given health education and motivation by nurses at ICCU. Posttest was performed in both groups in the end of intervention at 13.30. Results were documented as an intervention group and control group's anxiety score.

Data analysis
Paired t-test and Independent t-test were used for data analysis.
RESULTS

Table 1 Characteristics of respondents based on gender and age (N=56)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experiment n=28</td>
<td>Control n=28</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>17.9</td>
<td>14</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>32.1</td>
<td>14</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>65.54±11.989</td>
<td>66.68±10.449</td>
<td></td>
</tr>
<tr>
<td>Middle Age (45-59)</td>
<td>3</td>
<td>10.70</td>
<td>1</td>
</tr>
<tr>
<td>Elderly (60-74)</td>
<td>15</td>
<td>53.60</td>
<td>15</td>
</tr>
<tr>
<td>Old (75-90)</td>
<td>10</td>
<td>35.70</td>
<td>12</td>
</tr>
<tr>
<td>Medical diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-STEMI</td>
<td>5</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Heart rhythm disturbance</td>
<td>11</td>
<td>46</td>
<td>7</td>
</tr>
<tr>
<td>Heart failure</td>
<td>6</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>Vascular disorder</td>
<td>2</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 1 shows that the respondents in the experiment group consisted of female (32.1%) and male (17.9%), while respondents in the control group had equal number of male and female (25%), with p-value 0.28 (>0.05), which indicated that there was no difference of gender between the experiment and control group. The majority of respondents in the experiment and control group was in elderly group (60 – 74) of 53.57%, with p-value 0.749, which indicated that there was no difference of age between the experiment and control group. And the majority of respondents had heart failure (34%).

Table 2 Anxiety level in the experiment and control group (N= 56)

<table>
<thead>
<tr>
<th>Anxiety level</th>
<th>Experiment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>44.29±2.76</td>
<td>46.64±3.39</td>
</tr>
<tr>
<td>20-39 (Mild)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40-59 (Moderate)</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td>60-80 (Severe)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 shows that the mean of anxiety level in the experiment group was 44.29 and in the control group was 46.64. All respondents before intervention in the experiment group experienced moderate level of anxiety, and after intervention 20 respondents (71.40%) experienced moderate level and 8 respondents (28.60%) in mild level of anxiety. In control group, all respondents also had moderate level of anxiety, and after intervention 27 respondents (96.4%) still had moderate level of anxiety and 1 respondent (3.60%) experienced mild anxiety. There was not much difference in anxiety level before and after intervention in the control group.
Table 3 Effect of hypno-pressure on anxiety levels (N=56)

<table>
<thead>
<tr>
<th>Anxiety level</th>
<th>Mean ± SD</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experiment group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>44.29 ± 2.76</td>
<td>9.346</td>
<td>0.000</td>
</tr>
<tr>
<td>Posttest</td>
<td>39.71 ± 3.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>46.64 ± 3.39</td>
<td>0.420</td>
<td>0.691</td>
</tr>
<tr>
<td>Posttest</td>
<td>46.57 ± 3.89</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Paired t-test results in the table 3 shows p-value 0.000 (<0.05) in the experiment group, which indicated that there was a significant effect of hypno-pressure on anxiety levels in patients with cardiovascular. While in the control group obtained p-value 0.691 (>0.05), indicated that there was no significant effect of intervention in the anxiety level.

Table 4 Analysis of difference in anxiety levels between the experiment and control group (N=56)

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Anxiety level Mean ± SD</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pretest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>28</td>
<td>44.29 ± 2.76</td>
<td>2.853</td>
<td>0.006</td>
</tr>
<tr>
<td>Control</td>
<td>28</td>
<td>46.64 ± 3.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>28</td>
<td>39.71 ± 3.184</td>
<td>7.217</td>
<td>0.000</td>
</tr>
<tr>
<td>Control</td>
<td>28</td>
<td>46.57 ± 3.891</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 shows that there was a significant difference in anxiety levels between the experiment and control group with p-value 0.006 (<0.05), but it was not much difference. However, after given intervention, there was a big difference of anxiety levels between both groups, which the mean level of anxiety in the experiment group was 39.71 and control group was 46.57, with p-value 0.000 (<0.05) and effect size 1.96.

DISCUSSION

Characteristic of respondents
Findings show that female respondents (57.1%) experienced more anxiety than male (42.9%). Literature stated that, at the time of change in working status of some organs of the body, women are less able to be active and explorative. Women tend to withdraw and be silent. The fight-or-flight response in women is lower when compared to men resulting in a lack of energy reserves in the body. Reduced energy reserves in the body and the brain will make a weak preparation to accept the stressor. Women will become more sensitive to stressors. However, men can receive stress well and more able to accept anxiety (Nasution, 2007).

On the other hand, the age of respondents in this study explains that the elderly age group (60-74 years) was the largest group of respondents who experienced moderate anxiety with 30 respondents (53.57%). This research was in line with the theory explained that physiologically if the human body becomes older, the organ function of the existing system in the body decreases (Nasution, 2007).

Effect of hypno-pressure on anxiety levels in patients with cardiovascular disorder
The statistical results showed the mean±SD 44.29 ± 2.70 for pretest and 39.71 ± 3.18 for the posttest, with the t-value of 9.346 and p-value= 0.000, which can be used as the justification basis that there was a significant effect of hypno-pressure performed for 30 minutes with 2 sessions of administration on the decrease of anxiety levels. It is interesting
to note that this study used the combination of hypnotherapy and acupressure in reducing anxiety levels. This result was in line with previous study reported that 6 of 9 studies showed positive and significant effects of hypnosis to reduce stress (Fisch, Brinkhaus, & Teut, 2017). Another study revealed that there was a significant effect of hypnotherapy on anxiety in patients with lichen simplex chronicus (Vorizal, 2010).

According to previous study, respondents in the experiment group given hypnopressure will get support system through the mindset and nerve pathway. The system support is given by using positive affirmations in hypnotherapy sequences, with the aim of activating the subconscious while acupressure becomes the stimulus carried by the peripheral nerve pathway to the central nervous system (Mittleman, Taylor, Smetana, & Burns, 2015). The subconscious mind and conscious human mind communicate and work simultaneously in parallel. In the work system, between the conscious mind and the subconscious mind has a space where suggestions / affirmations work effectively. However, this will only happen if the Reticular Activating System (RAS) is open. RAS can be open when a person is experiencing strong emotions, when shocked, approaching and shortly after waking. This is when suggestions can be incorporated and can work actively. When the respondent is guided to enter the hypnotic atmosphere, and then the patient actually enters the hypnotic atmosphere, then that is when an affirmation that aims to improve self-defense against stressors can be given. The condition of relax and comfortable, the activation of the subconscious mind, as well as the provision of true affirmations, will be able to optimize one's ability to hold the stressor either from within or from outside (Fengge, 2012).

On the other hand, acupressure is recommended as an alternative non-invasive intervention to reduce anxiety and stress levels. The results of this study were in line with previous study revealed that acupressure had a significant effect on anxiety score with p-value <0.05. Respondents who received acupressure at some meridian points (Yintang, Tay Yang, Shenmen, Neguan and Shaofu) make a response to acupressure as a stimulus to the nervous system. Stimulus will continue from the peripheral nervous system to the central nervous system (brain). Upon stimulus in the brain, the brain will activate the pineal gland to produce the hormone melatonin and increased production of endorphin hormone. This hormone will affect the suprachiasmatic nucleus (SCN). During the induction phase, SCN helps decrease sleep latency and nocturnal awaking, increasing total sleep time and sleep quality (Fengge, 2012).

This study has several advantages compared to previous studies, which the intervention in this study was performed on 4 medical diagnoses (non-STEMI, heart rhythm disturbances, heart failure and vascular disorders) thereby further generalizing the functioning of intervention. In addition, this study was explicitly linked to the strength of the relationship of the intervention (hypnopressure) in lowering the anxiety level (relationship value= 1.96).

CONCLUSION

In conclusion, there was a significant effect of hypno-pressure in reducing anxiety levels in patients with cardiovascular disorder. It is recommended for nurses who have been certified can apply the hypno-pressure intervention in four medical diagnoses of cardiovascular disorders (non -STEMI, heart rhythm disturbances, heart failure and vascular disorders) in collaboration with other health teams.

This research is expected to contribute thoughts and insights and basic development of nursing actions as an alternative and independent care. The implementation of new intervention applications for hospital is strongly influenced by the policy of hospital, thus for nursing managers, the results of this study can be used as a pilot project.
Replication study is needed to examine the effect of hypno-pressure in clinical outcome.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

References


RELATIONSHIP OF SPIRITUAL-WELLBEING WITH ANXIETY AND DEPRESSION IN PATIENTS WITH CARDIAC HEART DISEASE

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Abstract

Background: Anxiety and depression are problems faced by patients with chronic diseases such as patients with Coronary Heart Disease (CHD). Both of these can also worsen the condition of CHD patients, thus needs to be prevented and handled. It is stated that spirituality can enhance constructive coping skills in patients with chronic diseases. But how it relates to anxiety and depression in patients with CHD in Indonesia is still unknown.

Objective: The study purpose was to identify the relationship of spiritual wellbeing with the incidence of anxiety and depression in CHD patients.

Methods: The research used descriptive correlative quantitative with cross sectional approach. The instruments used to measure the variables were Zung Self-rating Anxiety Scale, Beck Depression Inventory II, and Spirituality Index of Well-Being scale. Data were taken on 100 respondents within three months in outpatient cardiac unit with the consecutive sampling technique and analyzed by Spearman correlation test.

Results: The mean of anxiety, depression, and spiritual well-being respectively were 47.66, 43, and 60. Based on Spearman test, spiritual wellbeing was correlated with anxiety significantly $p= 0.000(r=-0.371)$ and so was depression $p= 0.000 (r=-0.571)$.

Conclusions: There was a significant relationship between spiritual well-being with anxiety and depression with negative correlation direction. The higher the spiritual well-being, the lower the level of anxiety and depression will be. Thus, nurses need to strengthen the spiritual aspects of CHD patients to prevent psychosocial problems.

Keywords: anxiety; cardiac; coronary; disease; depression; spiritual

INTRODUCTION

Coronary heart disease (CHD) is a disease that arises due to blockage of coronary arteries. It can cause injury and infarction of the myocardium, causing various physical and psychological disorders to the sufferer especially during acute attacks. These disorders include severe chest pain, shortness of breath and even death (Monahan, Sands, Neighbors, Marek, & Green, 2007). Psychologically, the disorder can increase the level of anxiety (Lewis, Heitkemper, Dirksen, O'Brien, & Bucher, 2010; Monahan et al., 2007). In this phase, CHD patients should undergo reperfusion and medication therapy to avoid death or more severe complications.

Based on previous research, it was known that psychosocial problems such as anxiety and depression were often experienced by CHD patients (Gustad, Laugsand, Janszky, Dalen, & Bjerkeset, 2013; Lane, Carroll, & Lip, 2003). So was in Indonesia the number of anxiety and depression in patients with CHD after the acute attack was quite a lot.
Anxiety and depression has a negative impact on the development of CHD (Rozanski, Blumenthal, & Kaplan, 1999). Stress, anxiety or depression directly affect the heart because it can increase the workload of the heart through increased demand for oxygen (Lewis et al., 2010), this condition will lead to an increase in angina frequency as well as further physical limitations in patients with CAD (Nuraeni, Mirwanti, Anna, & Prawesti, 2016). Moreover, depression can lead to the formation of thrombosis which may increase the risk of new coronary artery blockage resulting in recurrence (Libby & Theroux, 2005). This condition, can further aggravate the patient's psychological condition and affect the deterioration of the disease.

Anxiety and depression should be prevented in patients with CHD, and there are aspects of each patient that can be used as a source of coping in the face of stressors due to this disease is the spiritual aspect. However, the aspect of spirituality in patients with CHD is still often disregarded by health personnel compared with physical aspects. Whereas, several studies have proven that the spiritual can decrease symptoms of depression in patients with chronic disease (Lucette, Ironson, Pargament, & Krause, 2016), other studies have suggested that the higher the level of spirituality the lower the level of anxiety (Etnyre et al., 2006). Indonesian people has a strong religious culture, however, this religious culture cannot necessarily determine the high level of one's spiritual well-being because spirituality and religion are fundamentally different (Daaleman & Frey, 2004). Furthermore, the influence of spiritual well-being on anxiety and depression in CHD patients in Indonesia has not been widely studied. The concept of spirituality in each person is different and influenced by culture, development, life experience, illness experienced and one's perception of life and life (Puchalski et al., 2009) thus allowing the finding of different results in different populations.

This study was conducted to measure the relationship between spiritual well-being with anxiety and depression in CHD patients in Indonesia. As for anxiety in this study was an emotional response that lacked the specific object felt by CHD patients measured using the Zung Self Rating Scale (ZSAS) and depression were measured based on cognitive, affective and somatic symptoms based on Beck Depression Inventory II (BDI-II), while the spiritual well-being in this study was based on aspects of self-efficacy and life scheme developed in the spiritual index well-being scale. The study was expected increasing knowledge about aspects of spirituality and psychosocial problems in CHD patients in Indonesian population, and could increase the use of spiritual aspects by nurses in dealing with CHD patients in Indonesia particularly in West Java Province.

METHODS

Study design
This research used descriptive quantitative method with cross sectional approach. This study was conducted in a cardiac outpatient unit at a hospital in West Java and the data had been collected from April to June 2015, using consecutive sampling techniques with inclusion criteria were patients have been at least one month of treatment undergo post-acute heart attack, patients diagnosed with acute coronary syndrome (Unstable angina, NSTEMI, STEMI). The calculation of the number of samples used the formula for the study of correlation analysis in an unknown population. With type 1 error set at 5% two-way hypothesis, type 2 error is set at 10%, and the minimum correlation coefficient that was considered to be significant was 0.432, the number of subjects was 91 respondents. The total respondents who followed the study were 116 respondents, but who filled the instrument completely and in accordance with
the criteria set by the researchers was 100 respondents.

**Instrument**
Anxiety was measured using the Zung self-Rating Anxiety Scale (ZSAS). It had been tested and used in Indonesia with the result of validity and reliability i.e. 0.509 – 0.922 and 0.749 – 0.954 (Rachmi et al., 2015). Beck Depression Inventory II (BDI-II) Indonesian version used to measure depression, this instrument tested construct validity by Ginting, Näring, van der Veld, Srisayekti, & Becker (2013) in Validating the Beck Depression Inventory II research in Indonesia's general population and coronary heart disease patients with validation values r = 0.55, p <0.01 and reliability measured by alpha Cronbach of 0.90. In addition, Spirituality Index of Well-Being (SIWB) was used to measure the level of spiritual well-being and the validity and reliability had been tested in this study. Based on study this questionnaire had a validity score of 0.373 - 0.614 and had a reliability value of 0.805 - 0.825.

**Data analysis**
To describe sociodemographic data including age, gender, income, and comorbidities, quantitative descriptive analysis was performed using frequency distribution and percentage. Anxiety, depression and spiritual well-being were analyzed using frequency distribution, percentage and also mean scores with standard deviations. The relationship between variables was examined with bivariate data analysis using Spearman Rank test.

**Ethical consideration**
Ethical clearance for data collection had been obtained from the Research Ethics Committee of the General Hospital of Dr. Hasan Sadikin No. LB.04.01/A05/EC/179/V/2015. All respondents had informed consent and agreed to participate in the research.

**RESULTS**
A total of 116 respondents returned survey instruments, but only 100 respondents whose data were analyzed, because 16 respondents did not complete the survey or the criteria was not appropriate. Based on table 1, it can be seen that most of the respondents are over 45 years old and have male sex and had income between 1 - 3 million per month, and most did not have coexisting disease.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 45</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>&gt; 45</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>Female</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 million (Rp)</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>1 – 3 million (Rp)</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>≥ 3 million (Rp)</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Coexisting disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Not have</td>
<td>64</td>
<td>64</td>
</tr>
</tbody>
</table>

From table 2, it can be seen that respondents' anxiety levels were mostly at the mild to moderate level. While the level of depression as much as 37% of respondents experienced mild to moderate depression, 3% of respondents experienced severe depression. And most respondents had a high level of spiritual well-being.
Table 2 The level of anxiety, depression and spiritual well-being

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anxiety</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal (score 24-44)</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>Mild – moderate (score 45-59)</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Severe (score 60-74)</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td><strong>Depression</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimal (score 0-13)</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Mild (score 14 -19)</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Moderate (score 20 – 28)</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Severe (score 29 – 63)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Spiritual-wellbeing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (score &lt; 36)</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>High (score ≥ 36)</td>
<td>85</td>
<td>85</td>
</tr>
</tbody>
</table>

Table 3 The relationship between anxiety, depression and spiritual well-being

<table>
<thead>
<tr>
<th>Variables</th>
<th>Min score</th>
<th>Max score</th>
<th>Mean score</th>
<th>Standard Deviation</th>
<th>Spiritual-wellbeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>37.5</td>
<td>70.00</td>
<td>47.66</td>
<td>7.02</td>
<td>0.000</td>
</tr>
<tr>
<td>Depression</td>
<td>0.00</td>
<td>43.00</td>
<td>12.1</td>
<td>8.3</td>
<td>0.000</td>
</tr>
<tr>
<td>Spiritual-wellbeing</td>
<td>24</td>
<td>60.00</td>
<td>43.3</td>
<td>6.5</td>
<td>-</td>
</tr>
</tbody>
</table>

Based on table 3, it was shown that there was a significant relationship between spiritual-wellbeing with anxiety and depression with a negative correlation direction, the higher spiritual-wellbeing, the lower the level of anxiety.

**DISCUSSION**

From the results of the study revealed that 48% of respondents experienced mild to moderate anxiety and 8% experienced severe anxiety, in addition 22% of respondents experienced mild depression, 15% of moderate depression and 3% severe depression. This condition indicated that the anxiety and depression experienced by patients after acute attacks of CHD persist even in low level and percentages. Anxiety and depression experienced by patients with CHD disease following acute attacks may be occurred as a result of a diagnosis of serious illness, worsening health status, treatment interventions and recurrence of recurrent symptoms (Amin, Jones, Nugent, Rumsfeld, & Spertus, 2006).

Stress, anxiety or depression in CHD patients can directly affect the heart. This occurs as a result of sympathetic nerve stimulation, which increases the conduction velocity through the AV node thus increasing the heart rate and vasoconstriction of the blood vessels that will activate the renin angiotensin system (Monahan et al., 2007). This condition will cause an increase in the workload of the heart as a result of increased oxygen demand. Other studies described the effects of anxiety with a risk of heart attack, the research explained that anxiety was an independent factor that caused myocardial infarction (MI) (Scherrer et al., 2010). While, depression can increase the inflammatory reaction and this reaction is an intrinsic part of the onset of atherosclerosis and is associated with the release of cytokines (C-reactive protein and IL-1 and IL-6), which are referred to as inflammatory markers (Ridker, Hennekens, Roitman-Johnson, Stampfer, & Allen, 1998). This inflammatory marker is a predictor of the incidence of CHD and may worsen the prognosis of patients with CHD (Lindmark, Diderholm, Wallentin, & Siegbahn, 2001).

Spiritual well-being based on the research showed positive results. There were 85% of respondents included in the category of having high spiritual-wellbeing, otherwise based on mean score, the spiritual well-being of the respondents was at a high value. Indonesian culture strongly upholds...
religiosity. Many Indonesian people regard patience as well as resignation to God in the face of illness as part of worship, and it was further said that the knowledge and practice of religion can help someone to improve his spirituality (Nuraeni, Ibrahim, & Rizmadewi, 2013), this can be the cause of the high spiritual-wellbeing in the research. However, low spiritual well-being was still found, this condition may be occurred as a result of problems in dealing with God or disappointment to God (Ellison & Lee, 2010). Such perceptions can occur acutely to people who are experiencing stress or trauma conditions. Severe illnesses such as CHD may be perceived as severe and stressful events in some sufferers.

The results of research proved a significant relationship between spiritual-wellbeing with anxiety and depression with a negative correlation direction. The higher the spiritual well-being, the lower the level of anxiety and depression. The results of this study reinforced previous studies but in different patient populations, including research conducted by Bekelman et al. (2007) in patients with heart failure. They stated that spiritual well-being was significantly related to depression, when a person's spiritual well-being was high it will be less likely to get depressed (Bekelman et al., 2007). It was generally mentioned that the spiritual can reduce depression in patients with chronic diseases (Lucette et al., 2016). And so also with anxiety, spirituality can lower the anxiety level of patients with chronic diseases (Bekelman et al., 2007).

Spiritual-wellbeing can reduce depression because it can be used as a coping when experiencing chronic illnesses, spirituality can streamline the potential for patient self-protection (Bekelman et al., 2007). Someone who was able to achieve spiritual comfort or spiritual well-being would gain peace of mind. Peace of the soul can bring a positive influence on health, which can reduce stress levels. Along with the decrease in stress levels the body's homeostasis would be more preserved. The decreased of stress levels can also reduce the source of anxiety or depression, so that sympathetic activity could be lowered and workload of the heart would be decreased. This can lead to reduce physical complaints related to chest pain, fatigue and shortness of breath in CHD patients.

Spirituality and religion were positively related to mental, behavioral and physical health of patients with CHD (Krucoff et al., 2001). Nurse as a care provider must see the patient as a holistic entity including body, mind and spirit. Physical aspect is important but psychological and spiritual aspects also need to be considered. In providing spiritual nursing care, the nurse's task is helping the patient find or improve his spiritual well-being so that the patient is able to cope with the pain or suffering by using his spiritual power as a source of healing.

CONCLUSION

Spiritual-wellbeing was associated with anxiety and depression with negative correlation direction, the higher the spiritual well-being, the lower the level of anxiety and depression. Psychosocial conditions in CHD patients in the patient population in West Java Indonesia were still a problem, so this spiritual aspect can be considered to be used by nurses in overcoming the psychosocial problems of patients with CHD after experiencing acute attacks. Furthermore, it is necessary to study how spiritual in nursing intervention can influence the decrease of psychosocial problems in CHD patients.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

References

EFFECT OF PEER EDUCATION MODEL ON KNOWLEDGE AND SELF-EFFICACY OF CHILDREN IN THE PREVENTION OF PHYSICAL SEXUAL VIOLENCE

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Abstract
Background: The rate of incidence of physical assault on school children increases from year to year. Efforts to prevent child sexual violence can be done through school-based education with student empowerment.

Objective: To identify the effect of education by peers on the knowledge and self-efficacy of primary school children in preventing sexual violence in Grabag sub-district, Magelang regency, Indonesia.

Methods: This study was a quasi-experimental study with pretest and posttest non-equivalent control groups. A total of 84 school-aged children were purposively recruited from two different primary schools. Each group consisted of 42 respondents. Children's Knowledge of Abuse Questionnaire-Revised III (CKAQ-RIII) instrument was used to measure knowledge and self-efficacy questionnaire was measured for self-efficacy. Data were analyzed using Wilcoxon and Chi-Square test.

Results: The study showed that a statistically significant difference in the variables of both knowledge (p=0.008) and self-efficacy (p=0.000) in the intervention group after given peer education treatment.

Conclusion: Educational interventions by peers can improve the knowledge and self-efficacy of primary school-aged children in preventing sexual violence. Peer education can be used as an effort to prevent sexual violence in children through school empowerment programs.

Keywords: peer education; knowledge; self-efficacy; child sexual abuse

INTRODUCTION

Sexual violence against children is a serious problem with a prevalence ranging from 0-53% in girls and 0-60% in boys (Pereda, Guilera, Forns, & Gómez-Benito, 2009). The high risk of sexual violence in children is the age group of 7 to 13 years (Finkelhor, 1994). Surveys conducted in 155 girls aged 4-17 found that 81% of children were sexually abused and 68% were sexually harassed by more than one individual (Alejano & Alonso, 2005). The report of the National Commission for Child Protection in Indonesia by 2015 showed that 59.30% of 2,898 cases is a matter of sexual violence. The incidence of physical sexual violence is increased compared to previous years. Of 62% of cases of sexual
violence occurred in the immediate environment of the family and school environment and 38% in the public sphere. The perpetrators of sexual violence against children were those who were closest to the children, such as teachers, stepfathers, brothers, family, neighbors and even school security guard (Putra, 2015).

Child protection institutions in Magelang regency noted that in 2016 there were 25 cases of physical sexual violence in children (Faidah, 2016). The report of child sexual abuse in Grabag sub-district was obtained from case reports handled by the Police Criminal Unit of the Grabag sub-district and the report from the Public Health Center of Grabag I. In 2016 the Grabag District Police Sub-district has handled 2 cases of physical sexual violence and the Public Health Center of Grabag I has 4 cases of sexual violence in children during 2015-2016.

Prevention of sexual violence against children in school is done through school-based programs. The program of teaching children about preventing sexual violence is the most common type of prevention program (Brown & Saied-Tessier, 2015). A study shows evidence of improvement in protective behavior and knowledge among children exposed to school-based programs, regardless of the type of sexual violence prevention program (Walsh, Zwi, Woolfenden, & Shlonsky, 2016; Zwi et al., 2007).

School-based programs do not cause harm such as anxiety or fear in children or parents. Children enrolled in school-based sexual violence prevention programs are more likely to disclose their harassment than children who do not receive the program (Zwi et al., 2007). School-based sexual violence prevention activities include teacher training, health promotion model development, sexual violence prevention programs with theater method, psycho-education training, and games (Cecen-Erogul & Kaf Hasirci, 2013; Krahé & Knappert, 2009; Neherta, Machmud, & Damayanti, 2015). Another activity that can be done as an effort to prevent sexual violence is by using the school empowerment approach, including the education of peers.

Peer education is a common approach to encourage health-enhancing behavior, including sexual violence prevention behavior. Trained peers can communicate effectively with their peers and pass information through channels that health workers cannot use (Moshki, Zamani-Alavijeh, & Mojadam, 2017). Peer-led education in health is an effective method based on the belief that information, especially sensitive information, is more easily shared among individuals of the same age (Mellanby, Rees, & Tripp, 2000). This includes information on preventing child sexual abuse. Peer education is an educational process undertaken by a group with the same social standing to alter the knowledge, attitudes, beliefs, behaviors and skills at the individual level (UN, 2007). The education process by peers consists of educational program planning by peers, recruitment of educators, educational training, supervision and management of education programs, and monitoring and evaluation of education programs (USAID, 2010).

Previous research has reported on the effectiveness of the use of peer education in primary school children in the clean and healthy life behavior of school children (Fitriani, 2011), protection against sunlight (Ping, Lingli, Manoj Sharma, Yong Zhang, & Yong, 2014), health promotion of urinary tract infection prevention (Jahanbin, Heydari, Ghodsbin, & Sayadi, 2015), and health promotion of pediculosis prevention (Moshki et al., 2017). When school-aged children enter in the mid and late child years, they will exert their energies to master intellectual knowledge and skills (Hockenberry & Wilson, 2014). Formation of behavior is also influenced by self-efficacy factors.

Self-efficacy is an individual's belief in his/her ability to organize and accomplish a task to achieve certain outcomes (Bandura, 2006). Individual beliefs include his/her belief in the ability to prevent sexual violence. The
scope of nursing, especially community nursing, is to provide direct public health nursing services to all health care settings, one of which is in schools. Community nursing intervention strategies include health education, empowerment and group process (Stanhope & Lancaster, 2015). One form of school empowerment activity is peer education. Peer educators can work with teachers in the education process by peers or run educational activities independently either lead or organize school-based educational activities. Educational activities by peers can complement health education activities led by teachers and health care (UNICEF, 2012). The purpose of this study was to identify the effect of education by peers on the knowledge and self-efficacy of primary school children in preventing sexual violence in Grabag Sub-district, Magelang regency.

METHODS

Study design
This research used a quasi-experimental design with two groups, namely intervention group and control group.

Research subject
A total of 84 school-aged children were purposively recruited from two different primary schools. Each group consisted of 42 respondents. The inclusion criteria in this study were (1) fourth and fifth grade students; and (2) obtained permission from parents to become respondents. The study was conducted in two elementary schools located in Grabag sub-district, Magelang regency.

Instrument
The school-age knowledge variable was measured using the Children's Knowledge of Abuse Questionnaire-Revised III (CKAQ-RIII) instrument translated in Bahasa Indonesia and tested for validity and reliability. CKAQ-RIII is an instrument composed by L.M. Tutty and used to assess the level of knowledge of children about the concept of preventing sexual violence (Tutty, 1995). CKAQ-RIII in the Indonesian language has r-count value of 0.807. Self-efficacy variables were measured by self-efficacy questionnaire consisting of 29 questions with and having r-value of 0.807. The self-efficacy questionnaire in this study is the development of self-efficacy questionnaire by Bandura and has passed the content validity testing stage with three experts in psychology, nursing and community nursing with a Content Validity Rate (CVR) score of 1.00 (Bandura, 2006).

Intervention
This research consisted of two stages of research. The first stage was the training of peer educators in the intervention group. In the first phase, researchers and school teachers recruited 10 children to be trained to become educators. Educational training program was conducted for 6 days with training duration for 45 minutes for each day. Educator training used lecture, discussion and role-playing methods. The media used were flipcharts, games and video games. The second stage was the intervention stage, namely the education process by peers in the intervention group. The second phase of the research was done after the education training was completed. Peer education was done for 2 weeks with each session length of 25 minutes. Education by peers used discussion methods and playing games. The media used include flipcharts, sexual violence prevention videos, card games, snake ladder games, and drawing.

Data analysis
Data were analyzed using Wilcoxon test to assess the differences of knowledge and self-efficacy in each group. Chi-Square tests were used to assess differences in self-knowledge and efficacy in the intervention and control group.

Ethical consideration
All respondents and parents of respondents have obtained an explanation of the research objectives and benefits. Explanations were given orally and in writing. This research has been approved by the Health Research Ethics Commission of Faculty of Medicine University of Diponegoro and RSUP dr

RESULTS

Table 1 shows the average of age of the respondents in the intervention group was 10.95 years old and in the control group was 10.86 years old. Levene's test results showed that the age of the respondents in both groups was homogenous with p= 0.095 (>0.05). The majority of the level of education of parents was elementary school. There was no difference of the level of educational background in both groups with p=(0.102). Most families had poor incomes in both control and intervention group and homogeneity test showed the result of equal family income in both groups with significance value >0.05.

Table 1 Characteristics of respondents based on age of respondents, educational level of parents, and family outcome

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (n=42)</th>
<th>Control (n=42)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mean</td>
<td>10.95</td>
<td>10.86</td>
<td>0.095</td>
</tr>
<tr>
<td>SD</td>
<td>0.882</td>
<td>1.002</td>
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</tr>
<tr>
<td>Educational level of parents</td>
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<td></td>
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</tr>
<tr>
<td>Elementary school</td>
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<td>0.102</td>
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<tr>
<td>Junior high school</td>
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</tr>
<tr>
<td>Senior high school</td>
<td>10</td>
<td>10</td>
<td></td>
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<tr>
<td>Family income</td>
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<td></td>
</tr>
</tbody>
</table>

Table 2 Difference of knowledge and self-efficacy of school-aged children before and after given intervention

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (n=42)</th>
<th>Control (n=42)</th>
<th>p value</th>
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</thead>
<tbody>
<tr>
<td>Knowledge (Pretest)</td>
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</tr>
<tr>
<td>Good</td>
<td>25</td>
<td>24</td>
<td>0.123</td>
</tr>
<tr>
<td>Poor</td>
<td>17</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Self-efficacy (Pretest)</td>
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<td></td>
</tr>
<tr>
<td>High</td>
<td>19</td>
<td>22</td>
<td>0.827</td>
</tr>
<tr>
<td>Low</td>
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<tr>
<td>Knowledge (Posttest)</td>
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<td></td>
</tr>
<tr>
<td>Good</td>
<td>36</td>
<td>24</td>
<td>0.008</td>
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<tr>
<td>Poor</td>
<td>6</td>
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<tr>
<td>Self-efficacy (Posttest)</td>
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<tr>
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</tbody>
</table>

Table 2 shows no significant differences in child knowledge and self-efficacy prior to intervention in both intervention and control groups. Posttest results showed significant differences in knowledge and self-efficacy after intervention in two groups (p <0.05). Wilcoxon test results in the Table 3 showed a statistically significant difference both in the variables of knowledge (P=0.008) and self-efficacy (p=0.000) in the intervention group after given peer education treatment. However, the results of the analysis in the control group showed no significant differences before and after the intervention in self-knowledge and self-efficacy variables.
Table 3 Difference of knowledge and self-efficacy of School-aged children before and after given intervention using Wilcoxon test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (n = 42)</th>
<th>Control (n = 42)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>p</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>25</td>
<td>59.50</td>
<td>24</td>
</tr>
<tr>
<td>Poor</td>
<td>17</td>
<td>40.50</td>
<td>18</td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>36</td>
<td>85.70</td>
<td>24</td>
</tr>
<tr>
<td>Poor</td>
<td>6</td>
<td>14.30</td>
<td>18</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>19</td>
<td>45.2</td>
<td>22</td>
</tr>
<tr>
<td>Low</td>
<td>23</td>
<td>54.8</td>
<td>20</td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>33</td>
<td>78.60</td>
<td>17</td>
</tr>
<tr>
<td>Low</td>
<td>9</td>
<td>21.40</td>
<td>25</td>
</tr>
</tbody>
</table>

DISCUSSION

The results of this study indicated that there was a significant difference in the knowledge variable of school-aged children before and after peer education in the intervention group. The results of this study were in line with previous research that education by peers has an influence on the knowledge of school-aged children (Moshki et al., 2017; Ping et al., 2014).

Peer education is an educational approach based on the fact that many people experience changes not only based on what is known, but based on the opinions and actions of their close and trusted friend. Peers can communicate and understand in ways that adult educators cannot and can be role models for change. A qualitative evaluation of school-based peer education shows that young people appreciate and can be positively influenced by peer-to-peer interventions if designed and properly supervised (Moshki et al., 2017).

This study shows that education by peers affects the self-efficacy of school-aged children in the prevention of sexual violence. The results of this study were in accordance with other studies indicated that education by peers can affect one's self-efficacy (Varaei et al., 2017). Belief in self-efficacy is the result of a complex process of self-persuasion that depends on the cognitive process of various sources of efficacy information delivered directly and socially representative. Peers are the second source of efficacy information for children after the family.

As the social world grows rapidly, peers become important sources of information about one's ability. Children experience new relationships that can enlarge and validate their personal abilities (Pastorelli et al., 2001). This includes information on preventing child sexual abuse by peers through an educational process by peers.

Peer education can be applied in school-aged children with the consideration that children's views are relatively active and more volatile when they are among their peers, and school children are in a trend-following period of development. The influence of friends is strong, and children are much easier to listen to their peers than adults (Ping et al., 2014). A qualitative evaluation of school-based peer education shows that young people appreciate and can be positively influenced by peer interventions if designed and properly supervised.
supervised through methods and interesting learning media and appropriate to the child's developmental level (UNICEF, 2012).

CONCLUSION

Intervention in the form of education by peers is proven to increase knowledge and self-efficacy in school-aged children in preventing sexual violence. Peer education can be used as an effort to prevent sexual violence in children through the effort of school empowerment through School Health Program (UKS) program.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

References


SLOW DEEP PURSED-LIPS BREATHING EXERCISE ON VITAL LUNG CAPACITY IN POST-EXTUBATION PATIENTS IN THE INTENSIVE CARE UNIT

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Abstract

Background: The incidence of respiratory failure reaches 20-75 cases per 100,000 population each year with mortality rate reaching 30-50%. Provision of respiratory assistance with mechanical ventilation is provided with an indication of the inability of the respiratory function for optimal alveolar ventilation. Efforts to restore lung oxygenation ventilation function can be done through breathing exercises and are expected to improve pulmonary ventilation function.

Objective: This study was to examine the effectiveness of the modified Slow Deep Pursed-Lips Breathing Exercise (SDPLBE) on vital lung capacity in patients post-extubation of mechanical ventilators.

Methods: This was a true experimental study with pretest posttest control group design. Thirty respondents were selected using stratified random sampling, with 15 samples assigned in the experiment and control group. Peak flow meter was used to measure vital lung capacity (FEV1 value). Repeated measures ANOVA was used for data analysis.

Results: There was a significant difference on respondent's vital lung capacity after given slow deep pursed lips-breathing exercise at each session from session 1 to session 8 (p=0.000). However, both groups were not yet able to achieve ≥ 400 mL / min, but the experiment group was closer to the normal value (369) than the control group.

Conclusion: Slow Deep Pursed-Lips Breathing Exercise may increase vital lung capacity in patients post-extubation of mechanical ventilator.

Keywords: slow deep pursed-lips breathing exercise; vital lung capacity; post-extubation; mechanical ventilator

INTRODUCTION

The incidence of respiratory failure reaches 20-75 cases per 100,000 population each year with a mortality rate of 30-50% (Opdahl, 2010). Respiratory failure is the most common reason for treatment in intensive care unit (ICU). Respiratory failure is a pulmonary inability to maintain the O2 and CO2 homeostatic balance in the body and the inability of the lungs to provide adequate O2 or reduce CO2 in the body. Further respiratory failure may be defined as failure of ventilation and/or oxygenation failure caused by respiratory disturbance, chest muscle diseases, chronic inflammation of lung tissue and other causes such as trauma that damage lung tissue or other organs such as heart and brain (Winkelman, Workman, & Hausman, 2010).

Provision of respiratory assistance with mechanical ventilation is provided with an indication of the inability of the respiratory function to perform optimal alveolar ventilation (Sellares et al., 2009). The aid is to meet the body's oxygen requirements, reduce respiratory work, increase oxygenation to the
tissues or correct respiratory acidosis (Smeltzer et al., 2008). Multinational surveys with 5000 clients indicated that mechanical ventilation is used in cases of acute respiratory failure (69%), coma (17%), chronic respiratory failure (13%) and neuromuscular disorders (2%) (Rodriguez, Dojat, & Brochard, 2005).

The main indications of mechanical ventilator installation are the presence of respiratory or clinical failure leading to respiratory failure. Conditions leading to respiratory failure include refractory hypoxemia, acute hypercapnia, or a combination of both. Another indication is severe pneumonia that remains hypoxemic although given high-pressure oxygen or COPD exacerbation which the PaCO2 increases suddenly and leads to acidosis (Setiati et al., 2014).

When a patient using a mechanical ventilator starts breathing on his own and the reason the MV's installation is resolved, the nursing team may decide to wean the patient. Weaning is not always done as in the case of patients recovered from surgery. If the patient breathes spontaneously, consciously, can follow instructions, and normal vital signs, the patient can be extubated without the weaning period. Weaning is an organized trial in which the patient is allowed to breathe spontaneously for an extended period of time until the patient can breathe on his own after the MV is released (Terry & Weaver, 2014).

Nursing actions that have been implemented in the Intensive Care Unit of General Hospital of Dr. Moewardi Surakarta, General Hospital of Tugurejo Semarang City, and General Hospital of Ambarawa on post mechanical ventilation patients include: giving nasal oxygen for maintenance of oxygen requirement, hemodynamic monitoring, suctioning and postural drainage to overcome airway obstruction as well as daily needs fulfillment such as nutrition, elimination, fluid and electrolyte. According to literature, the role of nurses in monitoring lung oxygenation ventilation function is well done, even the manifestations of respiratory distress receive more attention from ICU nurses (Priyanto, Irawaty, & Sabri, 2011).

Efforts to restore lung oxygenation ventilation function can be done through breathing exercises and are expected to improve pulmonary ventilation function (Winkelman et al., 2010). El-Batanouny research said that breathing exercises after six weeks can increase respiratory muscle strength so that pulmonary ventilation function improves. Ventilation improvements can be achieved after diaphragmatic exercise, deep breathing, incentive spirometry, gait and limb exercises. Increased airway resistance and decreased residual air lead to the required inspiratory muscle strength to be minimal (El-Batanouny, Salem, & El-Nahas, 2009). Respiratory and chest muscle exercises can increase lung capacity. The results of previous study indicate a strong relationship between the capacity of diffusion and vital capacity of the lung. Exercise in the form of breathing exercises such as deep breathing exercise can be performed by healthy people or lung sufferers to increase lung volume and capacity (Nury, 2008).

According to literature, after extubation weaning, patients are encouraged to immediately practice deep breathing exercises every half hour, using incentive spirometers every 2 hours and train sitting semi fowler (Winkelman et al., 2010). Deep breathing exercise can be started 1 hour post-extubation by doing deep breath as much as 30 times per hour when wakeful (during the day) for first post operation for 4 days (Westerdahl, Lindmark, Eriksson, Hedenstierna, & Tenling, 2005). Deep breathing exercise consists of 10 deep breaths, divided into 3 stages for half an hour with effective cough pauses to mobilize secretions, if possible, patients do exercise with a sitting position. Nurses teach and supervise the practice of the patients who are instructed to perform maximum inspiration slowly to end Functional Residual Capacity (FRC) and minimize airway obstruction and alveolar collapse (Westerdahl et al., 2005). Some types of breathing exercises that can be recommended for pulmonary recovery are
Diaphragmatic Breathing Exercise (DBE), and Incentive Spirometer, Deep Breathing Exercise (DBE), and Pursed-Lips Breathing Exercise (PLB) (Smeltzer et al., 2008). Diaphragmatic Breathing Exercise (DBE) allows doing deep and full breath with little effort. Deep Breathing Exercise (DBE) is an important factor in performing effective and normal cough. A strong cough is often less effective compared with controlled cough, or coughing with Pursed-Lips Breathing Exercise (PLB) helps the patient to control the breath. The shriveling lips provide resistance to the air flowing out of the lungs, thereby prolonging the exhalation and preventing airway collapse by maintaining positive pressure on the airway (Kozier, 2008).

Deep Breathing Exercise and Pursed-Lips Breathing Exercise have been used in numerous studies to improve pulmonary oxygenation ventilation that researchers have summarized from a range of 10 years back. Deep Breathing Exercise (DBE), used by some researchers said that patients who did DBE after CABG surgery can minimize pulmonary atelectasis and better lung function on day 4 postoperatively than control group (Westerdahl et al., 2005), and DBE may increase pulmonary oxygenation (Winkelmann et al., 2010), and can increase oxygenation after major head and neck surgery without causing additional harmful hemodynamic effects (Gen, Ikiz, & Günerli, 2008).

Priyanto's study found a positive effect of DBE on ventilation oxygenation function in post-mechanical ventilation patients on days 4 and 5, but there was no significant difference in oxygenation function between 1 hour post-extubation and on the second day (24 hours post-extubation), the value of the vital capacity of the lung cannot reach ≥ 400 mL/min (normal value) (Priyanto et al., 2011). There was an increase in lung oxygenation ventilation function until day 5 but the value of the vital capacity of the lung cannot reach the normal value. Bilo indicated that Slow Deep Breathing improve lung oxygenation ventilation function indicated by increased oxygenation of blood, reduce blood pressure systemic and pulmonary high areas, but does not alter the diffusion of lung gas (Bilo et al., 2012).

Another breathing exercise that can be used is Pursed-Lips Breathing (PLB), shown in previous study indicated that Pursed-Lips Breathing study proved to increase gas exchange with increased arterial oxygenation and saturation (SaO2) as well as decreased levels of carbon dioxide in the arteries primarily by encouraging the use of slow and deep breathing patterns (Burtscher, 2009). This effect was observed in healthy subjects in low and high places as well as in patients with pulmonary edema and people with obstructive pulmonary disease. Frank conducted a 2 minute-PLB method study and then performed a forced inspiration test 5 times and followed by 2 minutes of PLB again, and 3 times forced expiration test, which the result could increase the inspiratory capacity of the lungs (Visser, Ramlal, Dekhuijzen, & Heijdra, 2011). Surya conducted a 10 minute PLB study after the subjects were 6 minutes walking (Bhatt et al., 2013), then Hartono indicated that PLB was effective on the increase in vital capacity of the lung (Hartono, 2015).

Based on effect size calculation from previous research, Westerdahl and Priyanto research showed a weak effect size on the influence of Deep Breathing Exercise intervention implementation to Lung Ventilation Function in post mechanical ventilator post-extubation (Priyanto et al., 2011; Westerdahl et al., 2005). Priyanto's research found that the effect size of DBE intervention on lung oxygenation ventilation function was -0.067 (very weak category), on respiratory pattern 0.17 (very weak category), and on oxygen saturation -0.58 (very weak category) (Priyanto et al., 2011). So, it can be concluded that the deep breathing exercise has not been effective or the effect is still weak in improving lung oxygenation ventilation function at 24 hours post-extubation in previous studies so that risk for reintubation is high. Grzegorz Billo's research revealed that slow deep breathing exercise can improve the
oxygenation ventilation seen from oxygen saturation by 3.37% and respiration rate decrease 1.7% at high altitudes (Bilo et al., 2012). Frank J. Visser said Pursed-lips Breathing Exercise can improve lung oxygenation ventilation function in patients with COPD disease as indicated by oxygen saturation increased 61.3%, inspiration capacity increased by 31.5%, respiratory pattern decreased by 57%, vital pulmonary capacity increased by 77% (Visser et al., 2011). Hartono said Pursed-lips Breathing Exercise can increase the vital capacity of lung in COPD patients seen from the results of research that the vital capacity of the lung increased as much as 23.88% (Hartono, 2015).

Based on the literature review and the above data, the potential for modification of the intervention of the existing type is still open for modification to improve the quality of Breathing Exercise in post-extubation weaning patients. Pursed-lips Breathing Exercise is one of the effective breathing exercises on improving ventilation function of pulmonary oxygenation. It is interesting for researchers to modify these two interventions to improve pulmonary oxygen ventilation function and time of successful weaning in post-operative extubation of mechanical ventilation. This study aimed to examine the effectiveness of the modified Slow Deep Pursed-Lips Breathing Exercise (SDPLBE) on vital pulmonary capacity in patients post-extubation of mechanical ventilators.

METHODS

Study design
This was a true experimental study with pretest posttest control group design.

Setting
The study was conducted for 3 months in 2017 in the Intensive Care Unit of the General Hospital of Pantiwlasa Citarum Semarang, the General Hospital of Roemani Semarang, and the General Hospital of Semarang City.

Sample
The target population is all patients post-extubation of mechanical ventilation in the three hospitals. The inclusion criteria of the sample were adult patients post 1-hour extubation of mechanical ventilation due to respiratory failure, patients were capable of spontaneous breathing, willing to be respondent, and understood instruction both orally and in writing. The exclusion criteria included patients in very weak condition, total bedrest program, patients with severe pain, received central nervous system drug, patients with tracheostomy, and had a history of surgery with the installation of mechanical ventilation maintenance program. Thirty respondents were selected using stratified random sampling, with 15 samples assigned in the experiment and control group.

Intervention
Experiment and control groups received treatment and medical action according to hospital procedure, namely suctioning, nasal oxygenation, over lying, basic needs fulfillment: electrolyte fluid, nutrition, elimination and personal hygiene. For the experiment group, Slow deep Pursed-Lips Breathing Exercise training was given with the procedure as the following: Exercise started from the preparation of tools and materials, hand washing according to the procedure, identifying post-extubation has reached the duration of at least 1 hour, checking the respiratory status, identifying the patient was not in severe pain, severe shortness of breath and emergency, ensuring the patient was conscious and able to follow orders well, arranging the patient's position, teaching effective cough if there was a secret, and the patient was instructed to do Slow Deep Pursed-Lips Breathing Exercise (SDPLBE) with the following instructions: the patient was instructed to breathe slowly and deeply through the mouth and nose, until the stomach was pushed to a maximum / expand and then let stand 3 seconds then exhaled slowly by pursing the lips (this breath exercise continued for 30 minutes followed by tidal volume inspection with forced inspiration and expiration forced irradiation).
The exercise was divided into 8 sessions in 24 hours and each session was 2 hours long. This breathing exercise was conducted in 8 sessions for 24 hours when patient was awake at 08.00-22.00 (7 sessions) and 06.00 (1 session). The control group was given nasal oxygenation of the canal and semi fowler position according to hospital procedure. In both groups, observation of lung oxygenation ventilation function was performed before and after exercise which started 2 hours after extubation and then observed the success of weaning after 24 hours post-extubation.

**Instruments**

To measure the vital capacity of the lung (FEV1 value), Peak flow meter was used. Vital capacity (VC) is the volume of air that can be exhaled after maximum inspiration. VC can be assessed from the results of measurement of forced vital capacity (FVC) and forced expiratory volume (FEV1). This examination may use a spirometry or peak flowmeter. The purpose of this examination was to measure objectively the airflow in the large airways. The observation sheet was also used to record the results of respiratory exercise procedure (Slow Deep Pursed-Lips Breathing Exercise) and lung vital capacity observation sheet (FEV1 value), developed by the researchers with good content validity results from the experts.

**Ethical consideration**

The ethical approval of the study was obtained from the Research Ethics Commission of Poltekkes Kemenkes Semarang (Approval No: 241 / KEPK / Poltekkes-SMG / EC / 2016). Prior to data analysis, each respondent has signed an appropriate informed consent.

**Data analysis**

Data were analyzed using repeated measures ANOVA.

### RESULTS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Total</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>Mean±SD</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Control</td>
<td>Mean±SD</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>**Age (Years)</td>
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</tr>
<tr>
<td>12-25</td>
<td>(50.33±16.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-35</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>36-65</td>
<td>12</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>(22.75±2.81)</td>
<td>0.262</td>
<td></td>
</tr>
<tr>
<td>(21.04±2.52)</td>
<td></td>
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</tr>
<tr>
<td><strong>Disease</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulmonal</td>
<td>8</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Non-Pulmonal</td>
<td>7</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td><strong>Hospital</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citarum Hospital</td>
<td>11</td>
<td>37</td>
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</tr>
<tr>
<td>Semarang Hospital</td>
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<td>7</td>
<td></td>
</tr>
<tr>
<td>Roemani Hospital</td>
<td>2</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows that the mean age between the experiment and control groups was not different (p = 0.110), which ranging from 36-65 years. The distribution of respondents by gender of both groups was also not different (p = 1.000), which most of respondents were females (56%). The mean BMI of the experiment group was 22.75 kg/m² and the control group was 21.04 kg/m². Respondents in this study had been stratified based on the history of the illness suffered by the respondent as the cause of the use of mechanical ventilator. Both groups were divided by type of pulmonary disease (53%)
and non-pulmonary disease (47%). This study collected the data of respondents from 3 different hospitals where the number of patients in Pantiwilasa Citarum Hospital was 21 people (70%), General Hospital of Semarang was 5 people (16.7%), and Roemani Hospital was 4 people (13.3%).

Table 2 Difference vital lung capacity on FEV1 value between experiment and control group using *Repeated Measure ANOVA* (Tests of Within-Subjects Effects) (N=30)

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session</td>
<td>80222.500</td>
<td>196</td>
<td>409.298</td>
<td>225.945</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 2 shows that the F value for the "session" factor was statistically significantly different (F 80222.5, 196, p = 0.00). Thus, it can be concluded that there was a significant difference on respondent's vital lung capacity after given slow deep pursed lips-breathing exercise at each session from session 1 to session 8.

Table 3 Difference vital lung capacity on FEV1 value between experiment and control group using *Pairwise comparisons* (N=30)

<table>
<thead>
<tr>
<th>Group</th>
<th>(Pre) Session</th>
<th>(Post) Session</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment group</td>
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<td>.000</td>
</tr>
<tr>
<td></td>
<td>1</td>
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<td>2</td>
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<td>.003</td>
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<td>.000</td>
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<td>6</td>
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<td>.000</td>
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<tr>
<td>Control group</td>
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<td>.000</td>
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<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>.061</td>
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<td></td>
<td>2</td>
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<td></td>
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<tr>
<td></td>
<td>7</td>
<td>8</td>
<td>.002</td>
</tr>
</tbody>
</table>

Table 3 shows the differences in the vital lung capacity before and after treatment at each session. The slow deep pursed-lips breathing exercise has a significant effect on increasing the vital lung capacity in session 2 with session 3, session 3 with session 4, session 4 with session 5, session 5 with session 6, session 6 with session 7, session 7 with session 8, and session 1 with session 8. In the control there was a significant effect between session 2 with session 3, session 4 with session 5, session 5 with session 6, session 7 with session 8 and session 1 with session 8. Table 4 shows that there was a significant difference between vital lung capacity at sessions 6, 7, 8 in the experiment group compared with the control group (p = 0.000). Both groups experienced an increase in vital lung capacity at the 4th session. However, both groups were not yet able to achieve ≥ 400 mL / min, but the experiment group was closer to the normal value than the control group (mean 369).

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Table 4 Analysis of FEV1 differences between experiment and control groups (N=30)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>Experiment</td>
<td>168.000</td>
<td>4.235</td>
<td>.956</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>167.667</td>
<td>4.235</td>
<td></td>
</tr>
<tr>
<td>Session 2</td>
<td>Experiment</td>
<td>168.000</td>
<td>4.272</td>
<td>.913</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>168.667</td>
<td>4.272</td>
<td></td>
</tr>
<tr>
<td>Session 3</td>
<td>Experiment</td>
<td>168.000</td>
<td>4.272</td>
<td>.913</td>
</tr>
<tr>
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<td>Control</td>
<td>168.667</td>
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<td>Session 4</td>
<td>Experiment</td>
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<td>.210</td>
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<tr>
<td></td>
<td>Control</td>
<td>170.000</td>
<td>5.328</td>
<td></td>
</tr>
<tr>
<td>Session 5</td>
<td>Experiment</td>
<td>193.333</td>
<td>5.636</td>
<td>.772</td>
</tr>
<tr>
<td></td>
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<td>191.000</td>
<td>5.636</td>
<td></td>
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<tr>
<td>Session 6</td>
<td>Experiment</td>
<td>260.667</td>
<td>7.908</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Control</td>
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<tr>
<td>Session 7</td>
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<td>311.333</td>
<td>9.720</td>
<td>.000</td>
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<tr>
<td></td>
<td>Control</td>
<td>229.000</td>
<td>9.720</td>
<td></td>
</tr>
<tr>
<td>Session 8</td>
<td>Experiment</td>
<td>369.000</td>
<td>11.340</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>255.000</td>
<td>11.340</td>
<td></td>
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</tbody>
</table>

DISCUSSION

Characteristics of respondents
Characteristics of respondents in this study included age, gender, and BMI conceptually as confounding factors estimated to have a relationship with dependent variable. Findings of this study showed that age, gender and BMI between the experiment and control groups were homogeneous. There was no difference of the characteristics between both groups. The mean age in both groups ranged from 36-65 years old, considered as elderly group.

According to literature, age may affect pulmonary function decline. Respiratory function and blood circulation will increase in childhood and reach maximum by age 20-30 years, then decrease again in the age of elderly. Pulmonary diffusion capacity, pulmonary ventilation, vital oxygen uptake and all other lung physiological parameters will be decreased in aging period (Hartono, 2015).

The results of this study fit Martin's opinion, et al that the average age of patients who successfully performed weaning and average extubation was more 59 ± 15 years. Martin also said that younger clients require shorter treatment and have higher survival, while older age has a higher dependence on ventilators (Burtscher, 2009). Most of the respondents were female, 60% in the experiment group and 54% in the control group. According to literature the incidence of respiratory failure in females was higher than the incidence in men. It is because the physiological capabilities of male lung compliance were higher, but Martin et al. also found that the success rate of weaning ventilators at women were higher (Burtscher, 2009).

The mean BMI of the experiment group was 22.75 kg/m² and control group was 21.04 kg/m², categorized as a normal category. Westerdahl et al found that the average respondent post mechanical ventilation has a BMI of about 27 ± 4 kg/m². A person who has a higher BMI describes the condition of obesity associated with decreased pulmonary compliance (Westerdahl et al., 2005).

Differences in Vital Lung Capacity Between Group Intervention and Control Group
Findings of this study showed that there was a significant difference on respondent's vital
lung capacity after given slow deep pursed lips-breathing exercise at each session from session 1 to session 8. It proves that slow deep pursed-lips breathing exercise can help the lungs to perform post-extubation adaptation. Exercise to inhale and exhale air helps developing chest circumference and train the respiratory muscles so as to increase vital volume and capacity. On day 4, the vital capacity of the lung increases very high. Pathophysiologically, in respiratory failure, there is an injury to the alveolar pulmonary membrane that may result in leakage of fluid into capillary webs leading to uneven imbalances of ventilation and oxygenation, which result in alveolar collapse. Pulmonary compliance becomes very decreased (stiff) resulting in decreased lung capacity characteristics, hypoxia and hypocapnia. Low flow state of hypoxia leads to metabolic disorders resulting in the formation and release of quinine, amines, serotonin and other toxic factors. Furthermore, vasoconstriction occurs, decreasing perfusion and alveolar stability, which is at risk of atelectasis, edema and hemorrhagic, and decreasing pulmonary compliance.

Slow deep breathing exercise is a lung activity to train breathing inspiratory muscles. Pursed-lips breathing exercises are exercises to train expiratory muscles to prolong exhalation and increase airway pressure during expiration, thereby reducing the number of airway traps (Smeltzer et al., 2008).

Slow deep pursed-lips breathing exercise is expected to train the inspiratory muscles to prevent the occurrence of such threats. According to literature, exercising the inspirator muscle will help improving vital pulmonary capacity (Padula & Yeaw, 2006). The results of this study strengthen Nury's study that breathing exercises can increase vital pulmonary capacity by measuring the values of FEV1 and FVC (Nury, 2008).

Deep breathing exercise is performed to produce a lower/negative pressure on the intrathoracic, so that air will flow from higher / positive atmospheric pressure into the lungs having a lower / negative pressure as a gas exchange process or lung ventilation (Padula & Yeaw, 2006). Guyton and Hall stated that the volume of air entering and exiting the lungs were recorder through spirometer/peak flowmeter examination (Guyton & Hall, 2012). The volume of air will reach its normal value when the functional ability of the lung is good. Breathing exercises will train the inspiratory muscles to increase the volume and ability of the lung capacity. The training of the inspiratory muscles will improve the lung's ability to accommodate the air volume, so that FEV1 values will increase. According to Padula and Yeaw (2006), breathing exercises aim to increase the ability of the inspiratory muscles in a variety of minimal conditions including the post mechanical ventilation. Muscle condition does not work during mechanical ventilation to be a lung-dependent factor. Some things that require breathing strength are conditions weakness and fatigue. Twenty percent of body energy and oxygen are used to support respiratory activity including supporting respiratory muscle activity during problems/disorders (Padula & Yeaw, 2006). Several experimental studies from Weiner in Padula and Yeaw (2006) suggest that inspirator muscle training has a significant impact on decreased complaints of breathlessness, increased FVC and reduce the range of symptoms of pulmonary impairment. In addition, Sperlich's study, et al suggests that breathing exercises can improve the physical appearance of a person free from weakness and fatigue conditions (Schiffer, Kleinert, Sperlich, Schulte, & Strüder, 2009).

Slow deep breathing exercise and pursed lips breathing exercise are ones of a combination of breathing exercises proven to increase the ability of inspiratory and expiratory muscle strength, as have been developed in several studies (Bilo et al., 2012; El-Batanouny et al., 2009; Hartono, 2015; Visser et al., 2011; Westerdahl et al., 2005). Slow deep pursed-lips breathing exercise will be able to complete treatment procedure actions,
especially nursing modal modalities that already exist in the context of intensive care. Monitoring should be done continuously to anticipate changes in oxygenation ventilation function so that emergency action needs to be done to overcome them. The most frequent causes of inadequate oxygenation ventilation function are airway obstruction as well as some underlying disease factors such as (i) central nervous system depressions, which will depress the respiratory center located at the bottom of the brainstem, excess plow of anesthetic drug, opium, head injury, stroke as well as brain infections; (ii) primary neurologic abnormalities that also affect respiratory function; (iii) postoperative period; and (iv) pleural disorders and trauma. Priyanto (2010) states that, in the short term, deep breathing exercise is beneficial to improve pulmonary function, similar with Hartono (2015) stated that pursed-lips breathing exercise can increase vital pulmonary capacity. Thus, a combination of the two may be useful in improving the function of pulmonary oxygenation ventilation.

Findings of this study showed that there was a significant difference between vital lung capacity at session 6, 7, 8 in the experiment group compared with the control group (p = 0.000). Both groups experienced an increase in vital lung capacity at the 4th session. However, both groups were not yet able to achieve ≥400 mL / min, but the experiment group was closer to the normal value than the control group (mean 369). The average of FEV1 in 1 hour post-extubation was only able to achieve no more than 160 mL/min, which indicated a very weak post-extubation lung condition, but after treatment increased to a value of 369 mL / min.

The slow deep pursed-lips breathing exercise intervention statistically resulted in a significant increase in forced expiratory volume of the first second with an average value of 369.00 ± 52.04 (54.5%) compared with the pre-treatment value (p <0.05). In this study also seen that slow deep pursed-lips breathing exercise effect was 18 (very strong) to the vital lung capacity of patients post-extubation mechanical ventilator. Some conditions, such as COPD and respiratory diseases, show that the vital capacity of the lungs under normal conditions is only about 200-300 mL / min, so the average FEV1 value of the results of the study illustrates that the respondents in the control group had a causative / risk factor of respiratory diseases.

CONCLUSION

In conclusion, slow deep pursed-lips breathing exercise intervention was effective to increase vital capacity of the lung, which can be seen from significant increase of FEV1 value from session 2 to 8 or 24-hour post-extubation. The effect size of the slow deep pursed-lips breathing exercise interventions obtained in this study was better than the previous studies. Slow deep pursed-lips breathing exercise interventions can increase FEV1 by 54.5%, so it is better used to improve vital lung capacity post-extubation of mechanical ventilator than the previous studies.

This breathing exercise can be a choice of therapy of nursing modalities in respiratory management. It is suggested for nurse clinic practitioners to apply slow deep pursed-lips breathing exercise to patients after 1 hour of extubation. Further studies is needed to examine the effectiveness of respiratory management on time of success of weaning seen from lung ventilation function per hour before 24 hours post-extubation of mechanical ventilator, and the effectiveness of respiratory management prior to extubation to the success of mechanical ventilator weaning using the PaO2 value of the blood gas analysis as an indicator in monitoring the oxygenation ventilation function.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

References


EFFECT OF HEALTH EDUCATION OF SLEEP HYGIENE ON SLEEP PROBLEMS IN PRESCHOOLERS

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Abstract

Background: Children need adequate sleep for good health status. Without a balanced sleep, it will encourage the emergence of serious health or developmental problems. Previous studies showed more than 40% of preschoolers experienced sleep problems.

Objective: To examine the effect of HESH (Health Education of Sleep Hygiene) on sleep problems in preschoolers.

Methods: Pretest posttest design non-equivalent control group was used in this study. Sixty participants recruited by consecutive sampling. Parents in the experimental group received health education using power point and booklet HESH for 100 minutes, parents in the control group received health education using power point for 100 minutes without booklet HESH. Telephone follow up was done for evaluation program. Sleep problem was measured with Children’s Sleep Habits Questionnaire (CSHQ) completed by children’s parents. Data analysis used unpaired t-test with 95% confidence interval.

Results: The result showed that there was effect of HESH toward sleep problems in preschooler (experimental group: 3.367±5.269; control group: 0.033±5.061, p= 0.015).

Conclusion: HESH in parents could decrease sleep problems in preschoolers in Indonesia. It is expected that HESH can be used as an alternative nursing intervention involved parents to decreases sleep problem in preschooler.

Keywords: CSHQ; health education; sleep problem; sleep hygiene; preschool

INTRODUCTION

Children need adequate sleep for good health status. Without a balanced sleep, it will encourage sleep problems then raises serious health disorders and developmental problems. Adequate sleep in children is necessary to optimize function of normal growth and development, maternal and family welfare (Bathory & Tomopoulos, 2017). The need for sleep in quantity in preschoolers is 10-13 hour per day (Foundation, 2017).

Sleep behavioral problems in children consist of bedtime resistance, sleep onset delay, sleep duration, sleep anxiety, sleep disordered breathing, night waking, parasomnias and daytime sleepiness (Owens, Spirito, & McGuinn, 2000). In this study, sleep problem is sleep behavioral problem which consists of bedtime resistance, sleep onset delay, sleep duration, sleep anxiety, sleep disordered breathing, night waking, parasomnias and daytime sleepiness and measured by Children’s Sleep Habit Questionnaire (CSHQ).

Research in China found 49.4% of children experienced sleeping problems (Z. Liu et al., 2013) while in Indonesia, especially in
Semarang, found that out of 183 preschool children (3-6 years old) and 146 (79.78%) of children had trouble sleeping with score of CSHQ more than 41 (Zahara, Hartanto, & Advyaka, 2013). The preliminary study at Salaman Mloyo village that randomly selected from all district of West Semarang, showed 93% of children experienced sleep problems with a score of sleep problems more than 41.

Parental mismanagement of sleep routines is a family factor due to sleep problems in children (Jones, Pollard, Summerbell, & Ball, 2014). Parenting attitude also a factor that positively correlates to child sleep problems (Jones et al., 2014; X. Liu, Liu, Owens, & Kaplan, 2005). Some non-pharmacological recommendations for parents include music therapy, counseling, sleep education programs, early care and education program, behavioral therapy and sleep hygiene (Gonzales, 2013; Gruber, Cassoff, & Knäuper, 2011; Halal & Nunes, 2014; Hockenberry & Wilson, 2014; Mindell, Kuhn, Lewin, Meltzer, & Sadeh, 2006; Staton et al., 2016; Wilson, Miller, Bonuck, Lumeng, & Chervin, 2014). Recommendations for parents to address sleep problems in children can be provided by health workers including nurses (Gruber et al., 2011).

Sleep hygiene is a term to describe practices on behavior and environment by parents and children to promote healthy sleep quality and intended to treat mild to moderate insomnia (Hauri, 1977). Systematic review of Halal and Nunes (2014) found that sleep hygiene was a non-pharmacological intervention and easy implemented and adhered (Halal & Nunes, 2014). Poor sleep hygiene was associated with sleep problems such as late bedtime (after 9 pm), longer sleep latency, parental presence in the bedroom and shorter sleep (Owens, Jones, & Nash, 2011).

Theory of Knowledge-Attitude-Practice (KAP) adopted by learning theorists suggests individuals who acquire knowledge related to practice, with that knowledge, they develop a positive attitude toward the practice, and this raises behavioral change (Bettinghaus, 1986; Chien-Yun, Wan-Fei, Yu-Hsi, & Chia-Hung, 2012). Based on the model of the firm, the first step to changing behavior is to equip someone with the appropriate knowledge and adequate. There is no research in Indonesia that examines the Health Education of Sleep Hygiene (HESH) to sleep problems in children. The purpose of this study was to examine the effect of health education of sleep hygiene on sleep problems in preschool children.

METHODS
Study design
This study was quasi-experimental study with pretest posttest design non-equivalent control group.

Participants
The study was conducted in sub-district of West Semarang, Indonesia, based on the highest number of kindergarten students in Semarang, Indonesia. West Semarang consists of sixteen sub-districts and Salaman Mloyo was randomly chosen. Based on preliminary studies in Salaman Mloyo, there were two kindergartens had same characteristic in social economic and academic schedule. Research conducted in both Kindergarten Talenta Semarang and Kindergarten Kanisius Kurmosari Semarang.

The inclusion criteria of the both experimental and control group were children aged 4-6 years, lived with both parents, did not experience deviations or emotional mental problems, ADHD, and had no history of seizures. The characteristics of parents included mother or father of Kindergarten students, could read and speak using Indonesian language, lived in one house with kindergarten students, aged between 18-44 years and willing to become participants. The exclusion criteria of children were: asthma, obesity, and taking anti-seizure medication. While for parents were parents who were educated under high school, earn below regional minimum wage or inpatient at the Hospital. Some of participant did not participate because of their limited time and
one of them just had a baby. Sixty participants recruited by consecutive sampling. Bias because the parent’s interaction is anticipated by determining one kindergarten to be an experimental group and the other kindergarten into control group (random determination).

**Instruments**

Children's Sleep Habits Questionnaire (CSHQ) Indonesian version, module and booklet HESH (Health Educational about Sleep Hygiene) and follow-up telephone checklist used as instrument in this study. There are many methods to measure sleep problems in preschooler including using CSHQ in Indonesian version. The CSHQ developed by Judith Owens, consists of 33 item questionnaire, parent-rated questionnaire for assessing the behavior associated with common pediatric sleep difficulties (Owens et al., 2000). The CSHQ contains 8 domains of sleep problems (sleep time resistance, sleep-onset delay, sleep duration, sleep anxiety, night waking, parasomnias, sleep disordered breathing and daytime sleepiness). Internal consistency of all item of the CSHQ in Indonesian version was 0.80 (Hartini, Herini, & Takada, 2017). A cut-off total CSHQ score of 41 could be utilized to identify children with sleep disturbances, and highlight sleep domains which warrant further clinical evaluation (Owens et al., 2000). Score CSHQ more than 41 indicated that children have sleep problems. Permitted and approval to use CSHQ was provided by Judith A. Owens (the owner of the instrument) and by Sri Hartini who developed the CSHQ instrument in Indonesian (Hartini et al., 2017; Irwanto, Rehatta, Hartini, & Takada, 2016). Booklet has been tested expert validity and tested legibility on the parents of kindergarten Miftaul Khoir.

**Data collection**

The research data was collected from March 2017 to May 2017 at two private kindergartens located in Salaman Mloyo, West Semarang, Indonesia. At the beginning of the study researchers explained research procedures and asked the participants to participate in the study by asking participants signed an informed consent. Then participants filled out the CSHQ questionnaire as the pretest data of sleep problems. Posttest data were collected at the fifth week after intervention.

**Intervention**

Experimental group received health education using power point and booklet of HESH for 100 minutes and followed up by telephone every week of a month. In the control group health education using power point for 100 minutes without booklet. Intervention was provided by a research assistant who had been briefed. The research assistant involved has requirements such as a nurse with a minimum education level of Bachelor of Nursing, having more than one year of working experience as a nurse in a clinic or educator or trainer. An assistant researcher on sleep hygiene education to both groups (in order to avoid bias), three other assistants who did telephone follow-up. The selection process and the research flow could be seen in Figure 1.

**Data analysis**

Distribution of data on the control group (p=0.154) and the experimental group (p=0.073) were normal, so unpaired t-test was used to analyze the effect HESH on sleep problem in preschooler. Effect size of HESH on sleep problems in preschooler analysis used Cohen’s test.

**Ethical consideration**

Research conducted after obtaining a letter of ethics of research ethics from the Research Ethics Committee of Faculty of Medicine Universitas Gadjah Mada Yogyakarta and research permission from the National Unity and Political Entity (Kesbangpol) Semarang City Government of Central Java Province. Ethical eligibility letter number is KE/FK/0183/EC/2017.
Figure 1 Flow Research

- The number of kindergarten students (Talenta) (n=55)
- The number of kindergarten students (Kanisius) (n=129)

Sample selection

- Selection by secondary data (age of child; age and level of education in parents)

Talenta Kindergarten as experimental group (n = 41)
Kanisius Kindergarten as control group (n = 114)

Come by invitation for examination

Talenta Kindergarten (n=36)
Kanisius Kindergarten (n=56)

Income less than UMR (standard) or experiencing history of asthma diseases (1) or epilepsy (2) or consumption of anticonvulsant (2) or suffering deviation of mental emotional problem (2) or ADHD (1) or obesity (8)

Talenta Kindergarten (n=34)
Kanisius Kindergarten (n=45)

Willing to become respondents and sign inform consent N = 60

Pretest (the first week)

Talenta Kindergarten as Experiment group (n=30)
Kanisius Kindergarten as Control group (n=30)

Education HESH by powerpoint and booklet HESH

Telephone follow-up 1
Telephone follow-up 2
Telephone follow-up 3
Telephone follow-up 4

Posttest (n=30)

Telephone follow-up 1
Telephone follow-up 2
Telephone follow-up 3
Telephone follow-up 4

Posttest (n=30)

Posttest (n=30)
RESULTS
Participant’s characteristic
Participants have the characteristics of parents (age, education and role) and child (age and sex) written in detail in table 1. Sixty participants met the criteria and followed the study, thirty participants in the control group and thirty participants in the experimental group.

Table 1: Different test results of study participants’ characteristics

<table>
<thead>
<tr>
<th>Sample</th>
<th>Characteristics</th>
<th>Classification</th>
<th>Control (N=30)</th>
<th>Experiment (N=30)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents</td>
<td>Age (year)</td>
<td></td>
<td>19-35</td>
<td>36-44</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14 (46.7)</td>
<td>16 (53.3)</td>
<td>0.301*</td>
</tr>
<tr>
<td></td>
<td>Level of education</td>
<td></td>
<td>12 (40.0)</td>
<td>18 (60.0)</td>
<td>0.091*</td>
</tr>
<tr>
<td></td>
<td>Role</td>
<td></td>
<td>5 (16.7)</td>
<td>28 (83.3)</td>
<td>0.424b</td>
</tr>
<tr>
<td>Child</td>
<td>Age</td>
<td></td>
<td>48-60 month</td>
<td>61-72 month</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>17 (56.7)</td>
<td>13 (43.3)</td>
<td>0.605a</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>17 (56.7)</td>
<td>13 (43.3)</td>
<td>0.426a</td>
</tr>
</tbody>
</table>

*p<0.05 | aChi-Square test | bFisher Exact test

Chi square test on parent age characteristics, parent education level, child age and gender of children in control group and experimental group showed p >0.05. Fisher test was used to examine the difference in parent roles between control group and experimental group because there were 2 cells with value count less than 5. Fisher test showed p >0.05 on characteristic of parent role, which can be concluded that the research participants in the control group and experimental group have the same characteristics.

Table 2: Sleep problems in the experimental and control group

<table>
<thead>
<tr>
<th>Score of sleep problem (CSHQ)</th>
<th>Pretest</th>
<th>Posttest</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Control group</td>
<td>45.43</td>
<td>6.13</td>
<td>44.50</td>
</tr>
<tr>
<td>Experimental group</td>
<td>47.07</td>
<td>5.38</td>
<td>43.70</td>
</tr>
</tbody>
</table>

95% CI (95% Confidence Interval of the difference) | aPaired t-test | **p<0.01

Table 2 shows that the mean of sleep problem before intervention in control group was 45.43 and after period time was 44.50 with p-value 0.971 (>0.05), which indicated that there was no significant difference in the mean value of sleep problem between before and after in control group. Meanwhile, decreases sleep problem in experimental group was significant with p-value=0.002 (<0.05) indicated there was a statistically significant difference on sleep problem.

The Effect of HESH on sleep problems in preschool children
Unpaired t-test and Cohen’s d were used to examine the effect of sleep hygiene health education on sleep problems. Unpaired t-test showed p=0.015 (<0.05), which indicated that there was a significant difference in the mean score of sleep problems in the experimental group with the mean score of sleep problems in the control group. The decreased score of sleep problems in the experimental group was significantly different than the decreased score of sleep problems in control group, which mean that HESH for parents influenced sleep problems in preschooler. Effect size of HESH was moderate because of d-Cohen value was 0.645. The effect of HESH in experimental group also showed the difference between before and after intervention.
DISCUSSION

Study of sleep hygiene education for parent towards sleep problems of preschool children was the first study in Indonesia. Previous research on sleep hygiene education was conducted in North Carolina, USA, New Zealand, Australia, and Michigan. Little is known about research on sleep hygiene developed in developing countries.

This study found that there was a significant influence of HESH on sleep problem in preschoolers. There were significant differences in deviation between sleep problems in the control and experimental group (-0.033±5.061 vs -3.367 ± 5.269) with mean difference of 3.333 (95% CI: 0.663-6.003) and p=0.015. The mean decrease was significantly different statistically but not clinically. But the effect size of HESH in this study was moderate (d=0.645).

The first reason of this result study was because the experimental group followed 100 minutes of sleep hygiene education from beginning until the end of session. The second reason was because participants received booklet of HESH. They read and applied the recommendation from this booklet. And the third reason was there was a telephone follow-up weekly in a month.

This study supports a systematic review conducted by (Halal & Nunes, 2014). Several studies in the systematic review stated that sleep hygiene methods improve the quality of child's sleep and decreases sleep problems of children. Another study declared health education about sleep in the form of a novel sleep education program for preschoolers and their families lowered the problem of child's sleeping behavior (Wilson et al., 2014).

Education using power point and booklet gives a chance for parents to learn and create behavior. During education, parents listened and paid attention in material of sleep hygiene. They also had a chance for asking and discussing their problem. Based on social learning theory by Bandura (1977), parents experienced four mediation processes (Bandura & Walters, 1977). Bandura conveys there are four mediation processes in social learning theory that occurs in a person such as attention (behavior must be attention to be practiced), retention (how much behavior can be remembered), reproduction (humans try to do what has been seen and processed) and motivation (behavior requires motivation to be practiced). In the process of sleep hygiene education, participants do the process of listening, understanding, remembering, getting motivated and then imitating or practicing what is taught so that there is a change of parental behavior toward preschoolers. The retention process is supported by the use of booklets and telephone follow-up once a week. Knowledge-Attitude-Practice (KAP) theory also underlies the behavioral changes (Bettinghaus, 1986; Chien-Yun et al., 2012).

The application of sleep hygiene by parents shows an increase in the learning level. Kirkpatrick's four levels of training evaluation mentions four levels of evaluation in training or learning such as reaction, learning, behavior and result (Kirkpatrick, 2009). The fourth stage of the theory, the result evaluation, is an evaluation of the influence on the environment caused by behavior.
change or performance improvement from the trainee. In this study, changes in the behavior of parents in the application of sleep hygiene to preschool children have an effect on the decrease in sleep problems of preschool children.

Sleep hygiene is a term that describes behavioral and environmental practices by parents and children to promote healthy sleep quality and is intended to treat mild to moderate insomnia (Hauri, 1977). Sleep hygiene is easy to apply and to adhere (Halal & Nunes, 2014). As well as through sleep hygiene parents can also regulate healthy sleep patterns and prevent sleep problems in children (Bathory & Tomopoulos, 2017).

The results of this study show that HESH received by the parents decreases sleep problems of preschool children. The decrease in pre-school child sleep problems is the effect of providing sleep hygiene education and is not influenced by other factors such as the characteristics of children and parents. This is supported by data that the participatory characteristics of parents (roles, levels of education and age of parents) and children (sex and age) in this study did not differ significantly in both groups.

Limitation of the study
Researchers found some limitations and weaknesses during the study. Parents had limited time because of their occupation so could not participate in this study. Evaluation of knowledge and attitude changes were not measured, which only based on the information from research assistant only.

CONCLUSION
Results of this study indicated that HESH for parents have a significant impact on sleep problems in preschoolers with moderate effect size. Health promotion about healthy sleep should be priority in community because of the impact of sleep problems can harm preschool children. Sleep hygiene booklets can be used as a media to provide health education to families and communities. Healthy sleep for preschoolers is a basic need of a child. Further research with bigger sample size is needed, with different design, setting and distinguished media in health education.

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Conflict of interest
The authors declare no conflict of interest with respect to the research, authorship, and/or publication of this article.

Author contribution
Authors contributed equally in this study.

References


VALUE OF CLINICAL PULMONARY INFECTION SCORE IN CRITICALLY ILL PATIENTS: BETWEEN THE USE OF CHLORHEXIDINE AND PIPER BETLE LINN MOUTHWASH

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Abstract
Background: One of the complications of ventilator use in patients in Intensive Care Unit (ICU) is Ventilator-Associated Pneumonia (VAP). Oral hygiene is one of the methods to prevent VAP.

Objective: The objective of this study was to compare the value of clinical infection score (CPIS) in critically ill patients after given oral hygiene using chlorhexidine and Piper betle Linn mouthwash.

Methods: This was an observational study with cross-sectional study design, which consisted of two intervention groups. Thirty respondents were selected using total sampling, with 15 respondents randomly assigned in each group. Independent t-test was used for data analysis.

Results: Findings showed that the mean of CPIS in the Piper betle Linn group was 3.80 and the mean of CPIS in the chlorhexidine group was 4.07.

Conclusion: CPIS in the treatment group using Piper betle Linn mouthwash was lower than the mean of CPIS in the treatment group using chlorhexidine.

Keywords: chlorhexidine; CPIS; Piper betle Linn; mouthwash; oral hygiene

INTRODUCTION

Airway infections associated with ventilator installations in patients in Intensive Care Unit (ICU) are known as ventilator-associated pneumonia (VAP), the most common nosocomial infection in ICU, which remains a health care problem worldwide (Fartoukh et al., 2003). Microorganisms that cause VAP is staphylococcus aureus, pseudomonas aeruginosa and enterobacteriaceae. Staphylococcus aureus is a normal flora in the oral cavity that can turn into a pathogen in case of trauma or abrasion on the mucosal surface (Forbes, 2007).

The incidence of VAP in the world is quite high, varying between 9-27% and the death rate can be more than 50%. Incidence of pneumonia increased by 3-fold in patients with ventilator. Cases of nosocomial pneumonia range from 5-10 cases per 1000 clients, which its incidence increased 6-20 times in ventilator-installed patients, and mortality rates range from 20-50% (Mangunrejo, Widjaja, Kusumo, & Sutoyo, 2004). VAP numbers in Indonesia varied considerably. In General Hospital of Dr. Moh. Hoesin Palembang there are 31.69% of VAP cases in 2011-2012 (Lestari, 2014); and in Sanglah Denpasar Hospital there are 15.48% per 1000 days usage in 2012 (Azis, 2013).
Assessment of Clinical Pulmonary Infection Score (CPIS) is commonly used for ventilator-associated pneumonia examination. In addition, sputum culture examination is also used to establish ventilator-associated pneumonia. The ventilator-associated pneumonia component consists of body temperature, leucocytes, tracheal secretions, oxygenation index, and radiological examination. The initial CPIS assessment is undertaken within 48 hours from the time the client first entered the ventilator, then the CPIS assessment is performed periodically (Luna et al., 2003).

Prevention of VAP can be done by two ways, which is non-pharmacology and pharmacology (Wiryana, 2007). Non-pharmacological way is routine and standard in intensive care using chlorhexidine (Ibrahim, Ward, Sherman, & Kollef, 2000). Study reveals that chlorhexidine used in oropharyngeal decontamination can decrease the incidence of respiratory tract infections in the intensive care unit up to 69% (DeRiso, Ladowski, Dillon, Justice, & Peterson, 1996), and can reduce the colonization of the bacteria cause VAP by 53% (Fourrier et al., 2000). However, although antiseptic have been used, VAP score is still high.

On the other hand, alternative antiseptic that lately used is derived from herbal plants namely betel leaf. Betel leaf is a traditional medicinal plant known as Piper betle L (Heyne, 1987). In the last 600 years BC, traditional Asian and Indian communities use betel leaves for various purposes, from customary to treatment purposes. The Indonesian people themselves have known the betel leaf as ingredients to assert with the belief that betel leaves can strengthen teeth, heal minor wounds in the mouth, remove body odor, stop gum bleeding, and as mouthwash (Moeljanto, 2003). Previous studies revealed that the use of decoction of betel leaf and 1% povidone iodine for oral hygiene is effective in reducing aerobic and anaerobic bacteria in patients with decreased level of consciousness at Islamic Hospital of Pekalongan Pekajongan (Nuniek & Antara, 2012).

Betel leaf is used because it contains essential oil consisting of bethephenol, chavicol, sekuterpen, hidriksivakal, cavibetol, estrogen, eugenol, and karvarool. The biochemical substances in betel leaves have the power to kill germs and fungi. In addition, mouthwash of betel leaf is natural having no side effects (Hidayat, 2013). Therefore, this study aimed at comparing the value of clinical pulmonary infection score in critically ill patients between the use of chlorhexidine and Piper betle linn mouthwash.

**METHODS**

*Study design*

This was an observational study with cross-sectional study design, which consisted of two intervention groups. The first intervention was treated with oral hygiene using a factory-made betel leaf mouthwash and the second one was treated with oral hygiene with a chlorhexidine solution 0.2%.

*Setting*

The research was conducted in ICU of the General Hospital of Prof. Dr. Margono Soekarjo, Central Java, Indonesia. The study began on 4 January 2017 until 4 February 2017.

*Sample*

Thirty respondents were selected using total sampling, with 15 respondents randomly assigned in each group. The inclusion criteria included patients using ventilators with endotracheal tube intubation (ETT) in the first day. The exclusion criteria included patients with terminal disease and HIV, oxygen saturation <90%, and sepsis patients related to infection with Systemic inflammatory response syndrome (SIRS) manifestations.

*Instrument*

Clinical Pulmonary Infection Score (CPIS) was used and performed on the 4th day of treatment, which included: (i) body
temperature (°C) using a mercury thermometer, (ii) leukocytes (/mm³) observed through observation of laboratory results, (iii) secret of trachea observed by seeing whether there is a secret or not, if any, purulent or not, (iv) oxygenation (PaO2/FiO2) observed through observation of laboratory results, and (v) photographs of thorax observed through observations of radiological examination results. Each score in each component is then summed and got score of CPIS from 0 to 10.

Intervention
Oral hygiene was done based on the standard of operating procedure (SOP) in the hospital setting. The criteria of good oral hygiene are the mouth mucosa and the tongue look pink, moist, intact. The gums are wet and intact, the teeth look clean, and slick, the tongue is pink and not dirty, the lips are moist, and mucosa and pharynx are clean. Oral hygiene was done twice daily by research assistant, starting from the first day of ventilator installation until the fourth day of treatment. The qualification of research assistant is having a minimum education classification of Diploma III of Nursing and working in the ICU of the General Hospital of Prof. Dr. Margono Soekarjo, Central Java at least 6 (six) months to ensure the same skill and competence in performing oral hygiene action. Betel leaf group used a 200 ml packed mouthwash contained of aqua, xylitol, piper betle (leaf) extract, melaleuca alternifolia (tea tree) leaf water, sodium benzoate, menthe viridis (spearmint) leaf oil, menthe piperita (peppermint) oil, and menthol. While chlorhexidine group used 0.2% chlorhexidine solution. Both of these antiseptic agents were administered at the time of treatment using a set of oral hygiene instruments for each respondent.

Data analysis
Statistical analysis was performed using SPSS version 21.0. Respondent characteristic data were analyzed and described using frequency and percentage. CPIS component data including body temperature, leucocytes, oxygenation, secret and chest radiographs were tested for normality as an independent test requirement of t-test and Mann Whitney test.

Ethical consideration
This study has been approved by the Research Ethics Committee of Poltekkes Kemenkes Semarang (Approval Number: 285 / KEPK / Poltekkes-Smg / EC / 2016). Study permission was also obtained from the General Hospital of Prof. Dr. Margono Soekarjo. Prior to data collection, each respondent has signed an appropriate informed consent, and the researchers explained the purpose and the procedure of the study and the confidentiality and privacy of the respondents were well maintained and they were given the freedom at any time to withdraw from the research.

RESULTS
Table 1 shows that the majority of respondents aged more than 60 years (36.7%). Most of them were males (53.3%), and suffered from nervous system disease (43.3%). Table 2 shows the clinical pulmonal infection score, which body temperature in both groups ranged from 36.5 to 38.4°C and most of respondents had no purulent secretion. Leukocyte component in the Piper betle Linn group was highest in the range of <4000 >11000 than leukocyte in the chlorhexidine group. In the oxygenation component, Piper betle Linn group was mostly in the category of ARDS (> 240) by 36.65%, while chlorhexidine group was mostly in the category of no-ARDS (≤ 240) by 30%. There was no localized infiltrate category in both groups.

Table 3 shows that the mean of CPIS in the Piper betle Linn group was 3.80 and mean of CPIS in the Chlorhexidine group was 4.07. It could be said that the CPIS value in the Piper betle Linn group was better than CPIS value in the chlorhexidine group.
Table 1 Characteristics of respondents based on age, gender, and type of disease (N=30)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Piper betle Linn n=15</th>
<th>Chlorhexidine n=15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>20-35 years</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>36-45 years</td>
<td>1</td>
<td>3.35</td>
</tr>
<tr>
<td>46-60 years</td>
<td>4</td>
<td>13.35</td>
</tr>
<tr>
<td>&gt;60 years</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>23.35</td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>26.65</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiration</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Heart</td>
<td>1</td>
<td>3.35</td>
</tr>
<tr>
<td>Nervous</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Urination</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Digestion</td>
<td>1</td>
<td>3.35</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>13.35</td>
</tr>
</tbody>
</table>

Table 2 Frequency distribution of respondents based on Clinical Pulmonary Infection Score (CPIS) (N=30)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Oral Hygiene</th>
<th>Range</th>
<th>Frequency</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Body temperature</td>
<td></td>
<td></td>
<td>Piper betle Linn</td>
<td>36.5-38.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>38.5-38.9</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;36.5/&gt;39</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Chlorhexidine</td>
<td>36.5-38.4</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38.5-38.9</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;36.5/&gt;39</td>
<td>2</td>
<td>6.65</td>
</tr>
<tr>
<td>Secret</td>
<td></td>
<td>No</td>
<td>Piper betle Linn</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes/No purulent</td>
<td>Yes/Purulent</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes/Purulent</td>
<td>5</td>
<td>16.65</td>
</tr>
<tr>
<td></td>
<td>Chlorhexidine</td>
<td>Yes/No purulent</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes/Purulent</td>
<td>11</td>
<td>36.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>13.35</td>
</tr>
<tr>
<td>Leukocyte</td>
<td></td>
<td>4000-11000</td>
<td>Piper betle Linn</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;4000/&gt;11000</td>
<td>Chlorhexidine</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4000-11000</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Oxygenation</td>
<td></td>
<td>&gt; 240 /ARDS</td>
<td>Piper betle Linn</td>
<td>11</td>
</tr>
<tr>
<td>PaO2/FiO2</td>
<td></td>
<td>≤ 240 /No ARDS</td>
<td>Chlorhexidine</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 240 /ARDS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 240 /No ARDS</td>
<td>Chlorhexidine</td>
<td>9</td>
</tr>
<tr>
<td>Photographs of thorax</td>
<td>No Infiltrate</td>
<td>Piper betle Linn</td>
<td>11</td>
<td>36.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diffuse Infiltrates</td>
<td>4</td>
<td>13.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Localized Infiltrates</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Chlorhexidine</td>
<td>No Infiltrate</td>
<td>7</td>
<td>23.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diffuse Infiltrates</td>
<td>8</td>
<td>26.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Localized Infiltrates</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*ARDS (Acute Respiratory Distress Syndrome)*
Table 3 Oral hygiene using Piper Linn Mouthwash and Chlorhexidine on CPIS using Independent t-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Piper betle Linn Mean±SD</th>
<th>Chlorhexidine Mean±SD</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPIS</td>
<td>3.80±1.373</td>
<td>4.07±1.100</td>
<td>0.562</td>
</tr>
</tbody>
</table>

DISCUSSION

Most of respondents in this study aged > 60 years as many as 36.7%. Literature said that age over 60 years is one of the risk factors for VAP. Elderly is also highly susceptible to respiratory system abnormalities, diminished neurological conditions, acute renal failure, shock, and metabolic syndrome. This is often associated with the frequency of elderly admitted to ICU due to several diseases accompanied with respiratory system disorder that requires the support of mechanical ventilator (Koenig & Truwit, 2006).

Findings of this study showed that 53.3% of respondents were males and 46.7% of them were female. Gender is a risk factor that cannot be modified. Males have twice the risk of VAP compared to females (Weinstein, Bonten, Kollef, & Hall, 2004). Of the 43.3% of respondents diagnosed with nervous system diseases, most of respondents had post craniotomy cases. A previous study showed that the highest case of patients with ventilator in ICU was a general surgical case (31.7%) (Lim et al., 2015). Similar with the other research stated that the most respondents (79.01% ) had the post-surgical cases (Singh, Rogers, Atwood, Wagener, & Yu, 2000). The success of the cerebral tumor craniotomy surgery was influenced by various things including perioperative management that will affect the success of the surgery. Postoperative thorough evaluation and post-operative treatment facilities such as facilities in intensive care unit (ICU) including ventilator support are highly regarded in the post-operative healing process (Esteban et al., 2000).

The results of this study indicated that the treatment group of oral hygiene using Piper betle Linn mouthwash found no respondent experienced VAP based on CPIS (3.80 ± 1.373). The ethanol extract of betel leaf has an effect as a powerful antibiofilm agent that can prevent and eradicate biofilms. This shows that ethanol extract of betel leaf can be used to inhibit pathogenic bacteria present in oral area, so it can be used as an alternative in preventing mouth disease (Teanpaisan, Kawsud, Pahumunto, & Puripattanavong, 2017). Gargling using betel leaf steeping with 100% concentration for 30 seconds can give optimum antibacterial effect to Streptococcus mutants (Hidayaningtias, 2008). Phenol compounds that are also present in betel leaves are bactericidal. When the phenol compound interacts with the cell wall of the microorganism, protein denaturation occurs and increases the permeability of the microorganism. Interactions between microorganisms result in changes in the balance of protein molecules, resulting in changes in protein structure and cause coagulation. Proteins that have denaturation and coagulation cause physiological activity loss that cannot function properly. Changes in the structure of proteins in the cell wall of bacteria will increase the permeability of the cell resulting in the growth of cells inhibited and then the cells become damaged (Nalina & Rahim, 2007).

In addition, betel leaf has a wide biological property and has an effective bioactive compound. Betel leaf has been recognized to have antibacterial and antioxidant properties that are sensitive to some pathogenic bacteria in the mouth (Bhalerao et al., 2012). Thus, the betel leaf rinse can be used as an alternative...
antiseptic to maintain oral hygiene. Similarly, the treatment group of oral hygiene using chlorhexidine found no respondents experienced VAP based on the mean of CPIS value (4.07 ± 1.100). Previous research suggested that oral care using chlorhexidine reduces the risk of developing VAP in patients with mechanical ventilation, and the use of chlorhexidine in ICU is highly recommended to prevent medical complications (Özçaka et al., 2012). Chlorhexidine at physiological pH can bind bacteria on the surface of the oral cavity, which is caused by the interaction between positive charges and chlorhexidine molecules. The wall of bacterial cell causes penetration into the cytoplasm and ultimately leads to the death of microorganisms (Patabnag, 2016).

The results of this study indicated that both antiseptics were equally well used for oral hygiene. Previous research on 144 respondents showed that oral hygiene using 2% chlorhexidine was more effective in preventing VAP and colonization of oropharyngeal bacteria than with chlorhexidine 0.2% (Zand et al., 2017). However, the use of chlorhexidine with higher concentrations has an effect on halitosis and stains on the teeth. So, the use of 0.2% chlorhexidine is effective enough to reduce the CPIS score on the patients with mechanical ventilator (Sebayang, 2010). VAP bacteria both gram positive and gram negative are very sensitive to the essential oil content of betel leaf and chlorhexidine.

CONCLUSION

Based on the results of the study, it is concluded that the mean score of CPIS in the treatment group using piper betle Linn mouthwash (3.80) was lower than the mean of CPIS in the treatment group using chlorhexidine (4.07). Further study is needed to compare these two oral hygiene agents in the prevention of VAP and perform culture checks to ensure the occurrence of ventilator-associated pneumonia, and CPIS evaluation could be performed more than one time if possible to find out how effective the action of oral hygiene in lowering CPIS or preventing ventilator-associated pneumonia.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

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EFFECTIVENESS OF COLD PACK WITH EARLY AMBULATION IN PREVENTING COMPLICATIONS OF HAEMORRHAGE AND HAEMATOMA IN PATIENTS POST CARDIAC CATHETERIZATION

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Abstract
Objective: To examine the effect of early ambulation with cold pack on the prevention of bleeding and haematoma complications in patients post-cardiac catheterization.
Methods: This research used an experimental method with randomized posttest-only control group design. Thirty respondents were randomly selected using simple random sampling, with 15 assigned in the experiment and control group. The experiment group was given cold pack and early mobilization, while the control group was given sand pillow with immobilization for 6 hours. Independent t-test and Fisher’s exact test were used for data analysis.
Results: Findings showed that there was no significant difference in haemorrhage between experiment and control group after given intervention (p= 1.000), and found a significant difference in haematoma between the two groups (p=0.001).
Conclusion: Cold packs with early ambulation and sand pillow with immobilization for 6 hours were equally effective in preventing haemorrhage. However, cold packs with early ambulation was more effective in preventing haematoma.

Keywords: sand pillow; cold pack; haemorrhage; haematoma; cardiac catheterization

INTRODUCTION

Coronary Heart Disease (CHD) is a heart disease caused by a narrowing of the coronary arteries due to a blockage of atheroma plaque. CHD is also called as atherosclerosis, which disturbs the blood flow to the myocardium. One of the medical management in patients with CHD is by cardiac catheterization (Kern, Sorajja, & Lim, 2015).

Cardiac catheterization is divided into coronary angiography and Percutaneous Coronary Intervention (PCI). Coronary angiography is performed by inserting a small plastic tube (catheter) into the artery and vein to the heart to obtain an X-ray image of the coronary artery and heart, as well as to measure hemodynamic in the heart (Kern et al., 2015). When a coronary block is identified, small wire with a floppy tip can penetrate the blockage and then widen with a balloon and if necessary stents are installed to revascularize the myocardium (Rifki, 2013).

At the Hospital of Jantung Harapan Kita, there were 5372 cardiac catheterization actions in 2015 consisting of 4728 angiography, 508 stents and 136 other actions. While in the Hospital of Dr. Kariadi Semarang there were 718 cardiac catheterizations in 2011 (Junait & Rifqi,
The success rate of coronary revascularization by cardiac catheterization is very high. According to previous study, the success of PCI to open up clogged coronary arteries reaches above 90% and continues to increase from year to year, compared with fibrinolytic drug therapy which is only about 50-60% (Rifki, 2013).

Cardiac Cath has a risk of complications that need to be wary of. Vascular complications that can occur include haemorrhage and haematoma (Rifki, 2013). Previous study used a sand cushion pressure of 2.3 kg at femoral access, and 10% had haematomas from a total sample of 30 patients (Sinaga, Nurachmah, & Gayatri, 2012).

The principle of wound care after cardiac catheterization after the removal of the femoral sheath is by closing the access of catheter stabbing, immobilization and pressure (Kern et al., 2015). The purpose of mechanical suppression with a sand cushion is to stop bleeding and haematoma from the femoral artery by suppressing the arteries and allowing the formation of clot (Manik, 2015).

A study conducted by King to compare the compression of sand cushions with cold pack applications after cardiac catheterization showed a significant difference (95% confidence interval, p <0.05) that vasoconstriction produced by cold pack applications was more effective in reducing haematoma complications than sand cushions (King, Philpott, & Leary, 2008). Use of a cold pack should not exceed 20 minutes as it may damage the skin surface, the occurrence of hypersensitivity and cold allergic reactions (Wnorowski, 2016).

Research conducted by Doyle with the result that early ambulation 1 hour after angiography with femoral access using 5Fr. catheter was safe, associated with low incidence of vascular complications (Doyle et al., 2006). Kern also argues that immobilization with small catheter diameter (e.g. ≤ 5Fr) can be immobilized in a short time of less than 2 hours (Kern et al., 2015).

Additionally, early ambulation 2 hours after cardiac catheterization with 6Fr. catheter is also declared safe, no large haematoma, no bleeding, or indication of the need for blood transfusion (Boztosun et al., 2008). Previous study also undertook a 3-hour early ambulation evaluation post catheterization of the heart with a 7Fr. catheter and the results suggest that it is safe as well as reducing the potential length of hospitalization and improving patient comfort (Mah, Smith, & Jensen, 1999).

Referral hospitals require a one-day surgery program for mild surgery, one of which is the diagnostic action of cardiac catheterization. Nevertheless, there is no evidence based post-cardiac catheterization care to change the program into one day surgery while the standard of operational procedure that is still implemented is immobilization program and sand pillow for 6 hours then observed in 2-3 days. The purpose of this study was to examine the effect of early ambulation with cold pack on the prevention of bleeding and haematoma complications in patients post-cardiac catheterization.

METHODS

Study design
This study was randomized control trial (RCT), with randomized posttest-only control group design.

Sample
Thirty respondents were randomly selected using simple random sampling, with 15 assigned in the experiment and control group. The inclusion criteria of the sample were all patients diagnosed with coronary heart disease, already undergone angiography, not more than 65 years old, and using 6Fr. catheter. The exclusion criteria were unconscious patient, having angiography with more than 1 puncture in the femoral artery, overweight (BMI >30), having complications such as CABG, conduction and heart rhythm disturbance, severe haemorrhage on the groin immediately after the removal of the sheath in...
the femoral artery, and patients with co-
comorbidities such as blood clotting disorders
and chronic renal failure.

**Intervention**

This study distinguished the incidence of
bleeding and haematoma complications in the
group of early ambulation with cold pack
compared with the use of a 2.5 kg sand pillow
and immobilization for 6 hours. Data
collection was done by qualified research
assistants (Diploma III Nursing, Clinical
nurse II and having BTCLS certificate). After
removal of the post-angiographic sheath
catheter, the stitch mark was given a cold
pack for 20 minutes, then 1 hour after the
release of the post-angiographic sheath
catheter, the respondents were asked to walk
for 10 meters away, with the note that the
respondents cannot fold the thighs. After that
6 hours observation was implemented to
determine the complications of haemorrhage
and haematoma. For the control group, after
removal of the post-angiographic sheath
catheter, the stitch mark was given a 2.5 kg
sand pillow and immobilized for 6 hours.

**Instrument**

An observation sheet developed by the
researchers was used to measure the
occurrence of bleeding, and a measuring tape
was used to measure haematoma and its
diameter in centimetres.

**Data analysis**

Univariate analysis was used to describe
gender, age, BMI, systolic and diastolic. One-
sample Kolmogorov Smirnov was used to test
the normality, which showed that the
experiment group (p = 0.696) and control
group (p = 0.275) have normal data
distribution. Independent t-test was used to
examine the effect of cold pack with early
ambulation on haemorrhage, and chi-square test
was used to examine the effect of cold pack
with early ambulation on haemorrhage, but
there were unfulfilled conditions that there
were 2 columns had value under 5 and sample
below 50, so Fisher's Exact Test was used.

Analysis of confounding variable of age,
BMI, systolic and diastolic on haemorrhage
using linear regression with Durbin Watson
test obtained p = 1.856 indicating no
relationship. While the result of normality
data test based on residual standard with one
sample Kolmogorov Smirnov test showed
normal distribution data with p = 0.15. And
analysis of confounding variables of age,
BMI, systolic and diastolic on haematoma
using linear regression with Durbin Watson
test obtained p = 1.006, which indicated no
relationship. While the result of normality
data test based on residual standard with one
sample Kolmogorov Smirnov test showed
normal distribution data with p = 410.

**Ethical consideration**

This research was conducted in the Hospital
of dr. Kariadi Semarang. Ethical approval was
obtained from the Health Research Ethics
Committee of the Health Polytechnic of
Kemenkes Semarang (Approval Number:
018/KEPK/ Poltekkes-Smg/ EC/2017). All
respondents were given an explanation of the
data collection process and signed informed
consent.

**RESULTS**

Table 1 shows that the there was no
respondents experienced haemorrhage in the
experiment group and 1 respondent (6.7%) in
the control group. For haematoma variable,
the majority of respondent had haematoma
with diameter of 0.1-1 cm (53.3%) in the
experiment group and 33.3 % of respondents
had no haematoma; while in the control group
53.3% of respondents had haematoma with
diameter of 1.1-5 cm and 46.7% had
haematoma with diameter of 0.1-1 cm.

Fisher’s extract test result in the table 2
obtained p-value 1.000 (>0.05), which
indicated that there was no significant
difference in haemorrhage between
experiment and control groups.
Table 1: Frequency distribution of haemorrhage and haematoma in the experiment and control group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Experiment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>No</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Haematoma (cm)</td>
<td>0.1-1</td>
<td>8</td>
<td>53.3</td>
</tr>
<tr>
<td></td>
<td>1.1-5</td>
<td>2</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Table 2: Difference in haemorrhage in the experiment and control group using Fisher’s Exact test (n=30)

<table>
<thead>
<tr>
<th>Haemorrhage</th>
<th>Group</th>
<th>X²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experiment</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>No</td>
<td>15</td>
<td>100</td>
<td>14</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3: Difference in haematoma in the experiment and control group using Independent t-test (n=30)

<table>
<thead>
<tr>
<th>Haematoma</th>
<th>Mean ± SD</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>0.420±0.4057</td>
<td>3.604</td>
<td>0.001</td>
</tr>
<tr>
<td>Control</td>
<td>1.307±0.8623</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Independent t-test as shown in the table 3 obtained p-value 0.001 (<0.05), which indicated that there was a significant difference in haematoma between experiment and control groups. And Linear regression as shown in the table 4 shows that there was no significant effect of confounding variables on haemorrhage (p=1.856) and haematoma (p=1.006).

Table 4: Analysis of confounding variables (BMI, age, systolic, diastolic) on haemorrhage and haematoma

<table>
<thead>
<tr>
<th>Variable</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confounding on haemorrhage</td>
<td>0.363</td>
<td>-0.008</td>
<td>0.183</td>
<td>1.856</td>
</tr>
<tr>
<td>Confounding on haematoma</td>
<td>0.319</td>
<td>-0.042</td>
<td>0.8178</td>
<td>1.006</td>
</tr>
</tbody>
</table>

DISCUSSION

Findings of this study showed that there was no significant difference effect of both interventions in the experiment and control group on haemorrhage. According to literature, angiography can only be done through an artery. The arteries distribute oxygenated and nutrient-rich blood to the distal tissues. Arteries injured by stab wounds during angiography will lead to the risk of bleeding (Kern et al., 2015). However, in this study, haemorrhage only occurred one time in the control group. The risk of haemorrhage is strongly related to platelet value, normal haemorrhage time and time of blood clotting that support the haemostasis process.

According to Corwin, the factors that affect haemostasis are the role of platelets, platelet accumulation, and coagulation reactions. Platelets in normal circumstances circulate throughout the body through the bloodstream. After blood vessel damage, platelets are
attracted to the area in response to exposed collagen in the subendothelial vessel layer. Platelets adhere to a damaged surface and then clot together to form a platelet plug that effectively blocks the injured area (Corwin, 2008). Platelets secrete various compounds such as prostaglandins and thromboxane derived from essential fatty acids, both of which are chemical attractants capable of summoning more platelets and leukocytes to the site (Sadikin, 2001). Platelets also secrete serotonin that causes vasoconstriction of blood vessels as the first step to reduce blood flow to the area. Blood clots in blood vessels from 15 seconds to 2 minutes. After 20 minutes to 1 hour, the clot will close the wound (Hall, 2015).

Cold packs help vasoconstriction of blood vessels and accelerate blood clotting time and formation of blood clots (Wnorowski, 2016). However, the purpose of this study was not to know the effect of cold pack on blood coagulation time that occurred in this angiography wound. Respondents in the experiment group who used cold packs did not bleed (n = 15). The other study using cold packs also did not bleed (n = 20) (Manik, 2015). Previous study showed that the use of sand pillow of 2.3 kg for 2, 4 and 6 hours resulted in no haemorrhage in all groups (n = 90) (Sinaga et al., 2012). While another study using sand pillow for 6 hours had 2 (2.2%) respondents bleeding (Junait & Rifqi, 2014).

In addition to cold packs, respondents also did 1-hour early ambulation, which was expected that there was no prolonged accumulation of platelet clumps that can lead to thrombosis (Sadikin, 2001). Excessive platelet accumulation can cause a decrease in blood flow to the tissue or lead to the formation of an embolus (Smeltzer et al., 2008).

Results of this study were not in line with previous study, which showed that 19 respondents (1.9%) post-angiography using 5Fr. Cath were bleeding after early ambulation for 1 hour (Doyle et al., 2006). The other study that conducted early ambulation for 2 hours after angiography resulted in mild haemorrhage in 25 respondents (2%) (Boztosun et al., 2008). Similar study comparing early ambulation for 3 hours (n = 472) with 5 hours (n = 408) after angiography found that there were mild haemorrhage in 53 respondents (13%) in the group of 3 hours ambulation and 115 respondents (24.4%) in the group of 5 hours ambulation (Mah et al., 1999).

This study used 6Fr catheter with no bleeding in 15 respondents (100%). The difference in sheath size catheter affects the size of the femoral artery wound. However, with no incidence of bleeding in the experiment group showed that for the use of 5 or 6Fr catheter is safe post-angiography treatment with cold pack followed by early ambulation after 1 hour.

The haemostasis condition in angiography lesions should be monitored periodically. In certain condition, blood clots may decompose and blood out of the blood vessels and spread in the surrounding muscles, or called haematoma. The occurrence of haematoma can be seen clearly on the surface of the skin but can also be seen vague, depending on the amount of blood in the muscles. The shape and extent of haematoma are irregular.

In this study, the measurement of haematoma was only measured visibly using haematoma diameter. Finding of this study showed a significant difference of haematoma after given cold pack. This result is in line with previous study revealed that the use of cold pack for 20 minutes can prevent and reduce the amount of haematoma (P <0.05; CI = 95%) (King et al., 2008).

It can be concluded that cold pack with early ambulation is as effective as sand pillow and immobilization in reducing the incidence of haemorrhage although there was an incidence in the control group. In addition, cold pack with early ambulation is more effective than sand pillow and immobilization in reducing the incidence of haematoma.
**Limitation**
The use of diameter in measuring haematoma might not be well enough. In addition, the variable of anxiety and environment were not measured as confounding variable that may affect the effect of the study.

**CONCLUSION**
Based on data processing and analysis, it can be concluded that cold pack with early ambulation was significant in preventing the complications of haemorrhage and haematoma. The research results can be used as an alternative in the prevention of haemorrhage and haematoma in patients post cardiac catheterization.

**Declaration of Conflicting Interest**
None declared.

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**Author Contribution**
All authors contributed equally in this study.

**References**


Rifki, S. (2013). Primary Percutaneous Coronary Intervention (Primary PCI), senjata" baru" untuk melawan serangan jantung akut [Primary Percutaneous Coronary Intervention (Primary PCI), "new" wean to fight acute heart attack]. *Medica Hospitalia-Journal of Clinical Medicine, 1*(2), 139-142.


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EFFECT OF HARIRING KABAYAN INSTRUMENTAL MUSIC THERAPY ON PAIN AND ANXIETY LEVEL IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Abstract

Background: Death due to acute myocardial infarction (AMI) continues to increase every year. Efforts to prevent AMI complications through the control of pain and anxiety with the approach of classical music therapy have been widely practiced, but the approach through local music has not been much done when transcultural nursing theory emphasizes the importance of cultural approaches in nursing care, while Indonesia has a lot of local music that is a cultural potential which needs to be developed.

Objective: This study aims to know the effect of Hariring Kabayan instrumental music therapy in reducing pain and anxiety of AMI patients after 24 hours of CICU admission.

Methods: This was a quasi-experimental study with pretest-posttest control group design. There were 32 participants selected using consecutive sampling, which 16 assigned in an experiment group and a control group. Hariring Kabayan therapy was played at 60 BPM using headphones connected to the MP3 player for 30 minutes. Numerical Pain Rating Scale (NPRS) was used to measure pain and Numerical Rating Scale Anxiety (NRS-A) was used to measure anxiety. Data were analyzed using Paired t-test and Independent t-test.

Result: Hariring Kabayan instrumental music therapy given for 30 minutes gave a significant change on pain in the respondents (p = 0.005), but it did not give a significant change on anxiety (p = 0.053), with significant value of 0.05.

Conclusion: Hariring Kabayan instrumental music therapy is effective in reducing pain in AMI patients but ineffective in anxiety reduction.

Keywords: acute myocardial infarction; pain; anxiety; instrumental music; Hariring Kabayan

INTRODUCTION

The World Health Organization (WHO) stated that the cause of death worldwide has shifted from infectious diseases to non-communicable diseases (NCD) (MOH, 2012). Deaths due to NCD are mostly caused by heart disease, which is equal to 39% (17.5 million cases). Of these heart diseases, 60% is Acute Myocardial Infarction (AMI), 30% of heart failure and 10% of heart disease. AMI mortality rate is predicted to continue to increase along with other NCDs, which in 2030 is estimated to reach 23.3 million cases of deaths (MOH, 2014). The Center for Health Data and Information of Indonesia mentions that in the United States each year 565,000 people experience a new AMI and 300,000 people have a reinfection (REAMI), which every 26 seconds one person has AMI, and every one minute causes one person to die (MOH, 2014).

Increases in mortality are also predicted to occur in developing countries on various continents, including in Asia. In Southeast
Asia in 2013, the average of deaths due to AMI was 1.8 million cases. In Indonesia, based on Basic Health Research in 2013, there were approximately 883,447 patients with AMI based on diagnostic categories and around 2.6 million AMI patients based on diagnostic and symptomatic categories. At the provincial level, the mortality rate in West Java is still considered high, above the national average, reaching 0.5% (1,500 patients) based on diagnosis category, or 1.6% or (4,800 patients) based on diagnosis and symptoms (MOH, 2013).

Acute Myocardial Infarction is a heart disorder caused by an imbalance between oxygen supply and oxygen demand resulting in irreversible cell damage and death of the heart muscle (Morton & Fontaine, 2008). In developed countries, AMI patients visit the hospital on average within 6 to 12 hours after heart attack, while in developing countries with limited transportation access and lack of emergency services, AMI patients can be more than 24 hours to the hospital. Patients will be given major medical management to maintain heart function in the emergency room and after 24 hours the patient is confirmed to be in intensive room for treatment with strict observation (Anderson et al., 2007).

Patients with acute myocardial infarction are closely related to specific chest pain, and as a factor of anxiety (Moradian & Msc, 2011; Morton & Fontaine, 2008). Study concluded that anxiety is a universal phenomenon in AMI patients (Sugiarto, Anies, Juliati, & Mardiyono, 2015). This is similar with the phenomenon in CICU of Hasan Sadikin Hospital in West Java, which the average number of AMI patients was 40 persons/month with pain and anxiety as the main complaint. Chest pain and anxiety peak at 12 hours after the onset, and after 24 hours the patient undergoes a gradual decrease in pain and anxiety (Jia et al., 2012). Chest pain in AMI patients is described with a very severe sensation in the arm and chest that spreads to the back, neck and jaw. While anxiety is due to a severe pain sensation and threats such as helplessness, failure, loss of control to death threats (Morton & Fontaine, 2008).

Pain and anxiety affect the work of the sympathetic nervous system that responds to an increase in heart working frequency characterized by increased vital signs such as pulse, blood pressure, breathing and cardiac output, if not properly treated will increase the heart muscle workload and increase the use of oxygen which may aggravate myocardial infarction (Morton & Fontaine, 2008). Management of pain and anxiety during the 24-hour period of patients treated in ICU is pharmacologically performed with sedation, but pharmacological therapy does not completely solve the problem, new problems such as respiratory depression and cardiac instability often appear, with non-pharmacological therapy approach (Hong, Flood, & Diaz, 2008; Ruan, 2007).

Music has been used since primitive period as a relaxing therapy. The power of music has been used in hospitals since Florence Nightingale era to help the healing process. This therapy continues to be developed until now including in the intensive room because it can reduce pain, anxiety and other psychological disorders (Mahdipour & Nematollahi, 2012; Suhartini, 2010, 2011).

The characteristics of music therapy is direct, low-pitched, has a tempo of 60-80 beats, flowing melody, regular rhythm and good tone quality (Chlan, 2009; Morton & Fontaine, 2008). Previous study stated that music therapy for 30 minutes can reduce pain and vital signs (Liu & Petrini, 2015). Supported by another study mentioned that music therapy for 20-90 minutes can affect the limbic system and stimulate alpha brainwaves that play a role in generating feelings of comfort, then stimulate the parasympathetic nerve to inhibit sympathetic nervous work to lower pulse, blood pressure and breathing (Darliana, 2008). However, a music used for therapy is the music that is familiar to patient according to Indonesian and its cultural context.
Cultural sensitivity in nursing is very important (Morton & Fontaine, 2008). The Leininger Transcultural Nursing Theory states that nursing care should be tailored to the beliefs, culture, values and lifestyle of individuals (Giger, 2016). The culture in West Java is one of the cultural diversities in Indonesia. The people of West Java, mostly Sundanese, are very familiar with Sundanese flute traditional music that has special meaning for the Sundanese people. Its seductive play seemed to bring in a peaceful, green, vast atmosphere with a calm wind (Dienaputra, 2011). Previous study revealed that Sundanese flutes are able to lower blood pressure (Supriadi, Hutabarat, & Monica, 2015) as one of the targets of nursing interventions in management pain and anxiety in AMI patients (Cutshall et al., 2011; Liu & Petrini, 2015).

Instrumental music of Hariring Kabayan is a combination of Sundanese flute music and the sound of nature. Hariring Kabayan music has the characteristics of music therapy that presents the natural atmosphere of West Java that has a calming effect. Hariring Kabayan music is expected to provide the calm atmosphere that AMI patients desperately need to control pain and anxiety to avoid complications (Cutshall et al., 2011). This study aimed to examine the effect of Hariring Kabayan music therapy on pain and anxiety levels of patients with acute myocardial infarction.

**METHODS**

**Study design**

This study employed a quasi-experimental method with pretest posttest control group design. The study was conducted in the CICU of Dr. Hasan Sadikin Hospital Bandung. The study began on February 17, 2017 until March 14, 2017.

**Sample**

The population in this study were all AMI patients treated in the CICU, Hasan Sadikin Hospital Bandung in the period of 17 February to 14 March 2017. Consecutive sampling was used to select samples. There were 32 participants selected, which 16 were assigned in the experiment and control group. The inclusion criteria of the sample included patients with AMI diagnosis, first incidence of attack, received anxiolytic & analgesic therapy, showed a pain score of at least 3 of the 0-10 Numerical Pain Rating Scale (NPRS), anxiety score at least 3 from 0-10 Numerical Rating Scale Anxiety (NRSA), male, loved Sundanese music, got family support and able to communicate verbally. The exclusion criteria consisted of AMI patients who refused to be respondents, patients with hearing loss and unconscious.

**Intervention**

This research was done by the researchers without research assistant. In the intervention group, respondents were recommended to take most comfortable position and emphasize to concentrate and focus during music therapy. Hariring Kabayan was played at 60 BPM using headphones connected to the MP3 player for 30 minutes. However, because respondents had different age levels then the volume was controlled by the respondents. The intervention was done in each patient’s room, not in the special place. But although each patient had his own room with a glass wall but problems arisen where the researcher could not create a conducive environment for music therapy. There was a noise from CICU devices such as ventilator alarms and health practitioners’ activities although efforts to minimize noise through headphones use had been made. While control group was given a deep breathing technique.

**Instrument**

Numerical Pain Rating Scale (NPRS) was used to measure pain (Sugiarto et al., 2015). The scale ranges from 0 to 10, the number 0 indicates no pain and the number 10 indicates very pain. The patient was given the discretion to show the scale that represents his condition.
Numerical Rating Scale Anxiety (NRS-A) was used to measure anxiety (Mardiyono, Songwathana, & Petpichetchian, 2011). The scale ranges from 0 (no anxiety) to 10 (severe anxiety). Patients were given discretion to demonstrate the scale representing their condition. NRS-A had been used to assess S-Anxiety within 48 hours in patients with AMI and showed low anxiety (3.08; SD = 2.62). The relationship between NRS-A and S-anxiety scale was quite positive (r = .52, p <.001). It shows that NRS-A can replace S-Anxiety scale. The advantage of NRS-A is the timeliness of measurements that only take a while and do not burden the patient.

**Ethical consideration**

The study has been approved by the Research Ethics Committee of Poltekkes Kemenkes Semarang (Approval No: 014 / KEPK / Poltekkes-SMG / EC / 2017). Prior to data collection, each respondent was given an informed consent providing information on the purpose, benefits and research procedures.

**Data analysis**

Data processing and data analysis used SPSS. Paired group analysis of the variables of pain, anxiety, diastole and pulse was performed using Wilcoxon test, while unpaired group test used Mann-Whitney test. Analysis of paired pairs of systole and pulse variables using Paired sample t-test, while unpaired test using independent sample t0test with significance value <.05.

**RESULTS**

Table 1 shows that the average of respondents in the experiment group aged 58.88 year ranging from 41-73 years old, while in the average age of the control group was 59.19 years old ranging from 45.75. Homogeneity test showed p-value 0.920 (>0.05, which indicated that there was no significant difference of age of the participants in both groups.

Table 2 shows that most of the respondents are STEMI patients and most of them are married. Both of these characteristics in both groups show an equal number respectively. There was no significant difference between the two groups (p>=0.05)

<p>| Table 1 Characteristics of participants based on age |
| --- | --- | --- | --- | --- |</p>
<table>
<thead>
<tr>
<th>Age</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Min-Max</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>16</td>
<td>58.88</td>
<td>9.106</td>
<td>41-73</td>
<td>0.920</td>
</tr>
<tr>
<td>Control</td>
<td>16</td>
<td>59.19</td>
<td>8.384</td>
<td>45-75</td>
<td></td>
</tr>
</tbody>
</table>

| Table 2. Characteristics of respondents based on type of AMI and marital status |
| --- | --- | --- | --- | --- |
| Variable | Experiment | Control | p-value |
| --- | --- | --- | --- | --- |
| Type of AMI | n | % | n | % | --- |
| NSTEMI | 7 | 46 | 6 | 38 | 0.465 |
| STEMI | 9 | 56 | 10 | 62 | --- |
| Marital Status | n | % | n | % | --- |
| Married | 11 | 68.75 | 10 | 62.5 | 0.710 |
| Widower | 5 | 31.25 | 6 | 37.5 | --- |
Table 3 Paired t-test in the experiment and control group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experiment (n=16)</th>
<th>Control (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>3.81 ± 0.65</td>
<td>3.88 ± 0.71</td>
</tr>
<tr>
<td>Post</td>
<td>3.31 ± 0.71</td>
<td>3.38 ± 0.719</td>
</tr>
<tr>
<td>Anxiety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>3.81 ± 0.834</td>
<td>3.81 ± 0.719</td>
</tr>
<tr>
<td>Post</td>
<td>3.81 ± 0.834</td>
<td>3.81 ± 0.719</td>
</tr>
<tr>
<td>Systole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>124.50 ± 15.24</td>
<td>123.81 ± 13.5</td>
</tr>
<tr>
<td>Post</td>
<td>120.94 ± 13.94</td>
<td>123.81 ± 13.5</td>
</tr>
<tr>
<td>Diastole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>81.88 ± 5.53</td>
<td>84.14 ± 7.16</td>
</tr>
<tr>
<td>Post</td>
<td>81.81 ± 5.49</td>
<td>81.38 ± 7.33</td>
</tr>
<tr>
<td>Pulse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>93.50 ± 18.52</td>
<td>88.56 ± 17.6</td>
</tr>
<tr>
<td>Post</td>
<td>90.19 ± 15.52</td>
<td>87.00 ± 16.03</td>
</tr>
<tr>
<td>Respiration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>22.25 ± 4.55</td>
<td>21.31 ± 4.79</td>
</tr>
<tr>
<td>Post</td>
<td>21.19 ± 4.50</td>
<td>21.25 ± 4.69</td>
</tr>
</tbody>
</table>

Table 4 Independent t-test in the experiment and control group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experiment (n=16)</th>
<th>Control (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Rank/ Mean</td>
<td>Sum Rank/ SD</td>
</tr>
<tr>
<td>Pain</td>
<td>19.50</td>
<td>312.00</td>
</tr>
<tr>
<td>Anxiety</td>
<td>19.00</td>
<td>304.00</td>
</tr>
<tr>
<td>Systole</td>
<td>3.56</td>
<td>±3.759</td>
</tr>
<tr>
<td>Diastole</td>
<td>16.50</td>
<td>264.00</td>
</tr>
<tr>
<td>Pulse</td>
<td>3.31</td>
<td>±4.799</td>
</tr>
<tr>
<td>Respiration</td>
<td>20.69</td>
<td>331.00</td>
</tr>
</tbody>
</table>

DISCUSSION

Effect of Hariring Kabayan instrumental music therapy on pain

Findings of this study showed that there was a significant effect of Hariring Kabayan music therapy in reducing pain. The significant decrease in pain in this study however is related to the mechanism of guide imagery or diversion through the music so that the respondents concentrate on the strains of Hariring Kabayan Instrumental music rather than the pain. In addition, Hariring Kabayan Instrumental music therapy composed of relaxation music, which is able to activate alpha wave on limbic that gives stimulus for the body to relax so as to enable the parasympathetic nerve impulse (Bunt & Stige, 2014).

It also relates to the Gate Control theory which mentions that, at one time, only one impulse can travel from the bone marrow to the brain, if this impulse is filled with another mind then the pain sensation is not sent to the brain so the pain can be reduced (Morton & Fontaine, 2008). Pain in AMI patients are a typical acute pain characterized by a blockage of coronary arteries that spur anaerobic metabolism due to a lack of oxygen supply, the effect of anaerobic metabolism is the buildup of lactic acid. Lactic acid then responds to pain mediators such as histamine, bradykinin, serotonin, prostaglandin and calcium ions which then stimulate pain receptors and activate the sympathetic nerves. From the sympathetic nerve, it is then passed on to the spinal cord, the reticular activation system, the thalamus, the hypothalamus, the somatosensory cortex limbic system and finally the pain is perceived (Morton & Fontaine, 2008). The parasympathetic nerve is a part of the opposite neural function and can block the sympathetic nerve so that the
transmission is not passed on as pain. The parasympathetic nervous system is active when the mood is good, concentration on the other and the presence of analgesics (Macintyre & Schug, 2014).

The results of this study were in line with support previous study indicated that music therapy given for 20 minutes in patients after heart surgery could significantly reduce pain compared to the control group who did not use therapy music (Cutshall et al., 2011). Similar with the other study stated that the role of music in intensive care medicine in 30 minutes is capable of reducing cortisol levels in cardiac patients. Music with beat, frequency, rhythm composition, slow rhythms can affect the brain and heart that produce calm that affects the physical, emotional, mental, social, aesthetic, and spiritual (Trappe, 2012).

Findings of this study also support Suhartini's (2011) study that examines the patient's comfort in intensive unit indicated that music therapy in 25-30 minutes can reduce pain so greatly contribute to patient comfort. AMI patients are patients with critical organ disorders that require a comfortable environment for their physical and psychological conditions (Morton & Fontaine, 2008). Thus, nurses in intensive unit are required to provide patient comfort, and Hariring Kabayan Instrumental music therapy can be used as an intensive therapy medium.

Hariring Kabayan music therapy has a moderate effect size of 0.484, which is better than previous study, which only have effect size of 0.12 (Cutshall et al., 2011). The resulting strength of the effect indicates that "known music" is capable of giving better effect, which is in accordance to Morton, et al (2008) stated that ICU patients choose music that is familiar to them for therapeutic use. So, it can be concluded that Hariring Kabayan Instrumental therapy is suitable for therapy for the people of West Java because it has a very familiar musical composition for the people in that province.

The strength of the resulting effects also indicates that the nurse's sensitivity to culture in nursing care is important to provide a curing environment and avoid cultural shock if the nurse does not understand the patient's background. This is in accordance with the statement of the theory which states that cultural sensitivity in creating a curing environment for intensive patients is very important in nursing interventions because the response and individual values may vary in culture (Morton & Fontaine, 2008).

Sundanese flute in Hariring Kabayan instrument is one of the local wisdoms of Sundanese culture. In the theory of transcultural nursing, local music is the application of the symbolic environment that is part of the "environment" in the Leininger theory paradigm. All respondents in this study are Sunda tribe and happy with Sundanese music. After done the Hariring Kabayan therapy, most of the respondents stated more relaxed and comfortable. The study of the potential use of local wisdom in reducing specific pain of AMI disease has not been done, but in other diseases in the other studies indicated that socio-cultural power through traditional music is able to provide the effectiveness on the decrease of pain significantly (Oktavia, Gandamiharja, & Akbar, 2013; Somoyani, Armini, & Erawati, 2013).

The results of this study when compared with previous research using a spiritual approach on AMI patients showed that the effect of Hariring Kabayan music is not better than spiritual approach (Sugiarto et al., 2015). This is because spiritual therapy provides a relaxing effect and reaches the deeper areas of the patient, while Hariring Kabayan therapy only provides a relaxing effect only. Nevertheless, both studies show that the holistic aspect of the patient's approach is able to contribute more to the decrease in pain of AMI patients after 24 hours of admission to ICU compared with nursing only focused on the physical aspect alone.
From the above discussion, the use of the cultural aspect of creating a "curing environment" for patients with intensive care has been shown to be effective in reducing the pain of AMI patients after 24 hours of CICU admission, as evidenced by the results of paired and unpaired group analysis, thereby Hariring Kabayan therapy is effective in reducing pain and leads to a positive effect on patient comfort and healing.

Effect of Hariring Kabayan instrumental music therapy on anxiety

Findings of this study showed that there was a significant effect of Hariring Kabayan music therapy in reducing anxiety in AMI patients after 24 hours of CICU admission. The effectiveness of this study is different from the effectiveness of the pain variables. Pain is literally related to anxiety (Ji, Fu, Ruppert, & Neugebauer, 2007), but Morton (2008) mentions that pain is not the only cause of anxiety; other causes of anxiety for AMI patients are the fear of death, sense of isolation, the threat of helplessness and the threat of loss of function and self-esteem. Thus, the results of this study may be influenced by many other factors besides pain in the form of threats that disturb the patient psychologically.

During interviews, several patients revealed that their hearts were no longer intact so they were worried about a repeated attack which is more severe and takes their lives. Other concerns were about the survival of their abandoned family members. Concerns of respondents as described above are common for heart patients (Moser et al., 2010). Study indicated that poor management of anxiety can lead to depression and more dangerous (Roest, Zuidersma, & de Jonge, 2012). This proves that someone who has been suffered from AMI will continue to get anxiety even depression. Thus, the meaninglessness of the results of this study in reducing anxiety is often found that because anxiety is part of the psychologically complicated heart patients, it is what inspired some researchers above to examine and find the best method to improve quality of life by improving the psychological patient post-AMI (Moser et al., 2007).

Although the results of Hariring Kabayan music therapy were almost close to the significant (p = 0.053) limit, but in this case, it is concluded that it has not been effective in reducing the anxiety of AMI patients. Problems during the research is that researchers have not been able to create a conducive environment for music therapy. Noise from the CICU environment such as the sounds of ventilator machines and the activities of health practitioners were most widely expressed by patients, which cannot be controlled due to the procedure of treatment. Efforts to minimize noise had been done with the use of headphones while listening to music, but the results had not been maximized. The meaninglessness of the anxiety score is also consistent with the systole, diastole and pulse scores that were also not significant, according to the Morton, et al (2008) statement, based on a study of 2,500 respondents, it was concluded that there are 5 main indicators of anxiety: blood pressure, pulse, agitation, anxiety and patient statements. This suggests that systole, diastole and pulse are closely related to anxiety as a clinical indicator. While respiratory scores showing significant numbers were not included as a major indicator of anxiety.

Through the above description, although statistically the overall conclusions of the results of this study did not indicate a significant rate of decrease in anxiety, but Hariring Kabayan music therapy with a background of cultural aspects on the basis of paired groups gives a better effect than interventions that only focus on the physical aspect alone in decreasing anxiety of AMI patients.

CONCLUSION

Hariring Kabayan music therapy is effective in reducing pain in AMI patients, but not effective in reducing anxiety. However, this therapy can be used as a complementary
therapy in reducing pain, especially for AMI patients in West Java. Further research is expected to modify a more conducive environment for music therapy.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

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EFFECT OF SPIRITUAL NURSING CARE ON THE LEVEL OF ANXIETY IN PATIENTS WITH STROKE

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Abstract
Background: Anxiety in stroke patients occurs as a normal reaction to stress with life changes; however, when it becomes excessive, it will be disorder. Effort to deal with anxiety is needed and spiritual approach nursing care is considered useful in caring patients with stroke.

Objective: To examine the effect of spiritual nursing care on anxiety in stroke patients in the inpatient ward.

Methods: This study used a quasi-experimental design with pretest-posttest control group. Thirty respondents were selected using consecutive sampling, which 15 respondents assigned in the experiment and control group. The Hamilton Anxiety Rating Scale was used to measure anxiety. Data were analyzed using paired t-test and independent t-test.

Results: The results showed that the mean level of anxiety in the experiment group before intervention was 29.33 and decreased to 9 after intervention, while in the control group the mean level of anxiety before intervention was 29.47 and decreased to 17.73 after intervention. Paired t-test obtained p-value 0.000 (<0.05), which indicated that there was a significant effect of spiritual nursing care on anxiety levels in patients with stroke.

Conclusion: Spiritual nursing care could reduce anxiety in patients with stroke.

Keywords: stroke; caring; spiritual; anxiety; patient

INTRODUCTION

Stroke is a state of a sudden neurological deficit due to partial or total obstruction because of thrombus or embolus in the cerebrovascular or ruptured blood vessel wall (Patricia, Dorrie, & Barbara, 2012; Smeltzer et al., 2008). Stroke is the second leading cause of death in the world (WHO, 2017). In 2030 the mortality rate is projected at 7.8 million caused by stroke (Grotta & Lo, 2015). In Indonesia, the prevalence of stroke is 12.1 per 1000 population (MOH, 2013).

Clinical manifestations of stroke depend on the area of the lesion and the amount of collateral circulation. Clinical manifestations vary, associated with psychological form of emotional disturbance such as anxiety (Sami, Shirley, & Nadina, 2015; Zulkifly et al., 2016). Anxiety exists because of disability, and sudden life changes due to stroke (Zulkifly et al., 2016). Anxiety rates range from 22-28%, whereas anxiety levels vary from mild, moderate, and severe. Anxiety levels with moderate category is the greatest number reaching 71.8% (Kneebone & Lincoln, 2012; Kustiawan, 2015; Norrving, 2014). Anxiety can affect the quality of life of the patient, interfere with emotional function,
cognitive and adaptation to disease, disrupt the recovery process, decrease patient independence in activity daily living, disturb social interaction and isolation (Ferro, 2013; Mead & Van Wijk, 2012; Tanner, 2008), and even lead to a spiritual crisis (Sammarco, 2016).

Non-pharmacological approaches to overcome anxiety can be given a holistic care, including spiritual nursing care (Dossey, Certificate, Keegan, & Co-Director International Nurse Coach, 2012). This is in line with Swanson's view indicated that human is viewed as a spiritual being in caring theory (Alligood, 2014). Spirituality plays a major role in supporting individuals to achieve the balance between body, mind and spirit needed to maintain health and wellbeing, and in adapting to ill conditions (Patricia et al., 2012). Koenig's opinion in the stroke patient recovery process, indicated that spiritual factors have a major role in maintaining motivation and hope (Koenig & Saris, 2002). This study aimed to examine the effect of spiritual nursing care in reducing anxiety in stroke patients in the inpatient ward.

METHODS

Study design and setting
This study employed a quasi-experimental design with pretest-posttest control group. This study was conducted in the general hospital of dr. H. Moch. Ansari Saleh Banjarmasin from 3 March to 28 April 2017.

Sample
The target population in this study was all non-hemorrhagic stroke patients in the general hospital of dr. H. Moch. Ansari Saleh Banjarmasin in 2017. Of 30 samples selected using consecutive sampling, which divided into experiment group (15 respondents) and control group (15 respondents). The inclusion criteria of patients were: compositesnts, non-hemorrhagic stroke, experienced anxiety and willing to participate in the research by filling informed consent.

Intervention
Spiritual nursing care intervention is developed based on caring theory (knowing, being with, doing for, enabling, and maintaining belief) of Swanson and caring dimensions of O'Brien about the practice of spiritual care (being with, listening, touching). The spiritual nursing care was given in three days with the following steps: (i) preparing and managing room with adequate ventilation and lighting, and keeping the patient's privacy, (ii) greeting with eye contact and smiling, introducing and sitting beside the patients, listening to the patient's experience (the nurse's eyes focused on the patients, not seeing elsewhere while the patient was talking, avoiding interrupting, denouncing or interrupting), focusing on verbal and nonverbal expression of patient feelings, answering their questions as necessary, staying with patients in silence while not talking because patients feel pain and sensitive, (iii) responding to the most basic needs of patients such as eating, drinking, personal hygiene, dressing, decorating, eliminating, facilitating the need for prayer, or refer to religious leaders when necessary, and (iv) informing families to engage in care, and motivating patients with reinforcing words, and re-clarifying the things needed before leaving the patient room.

Instrument
Hamilton Anxiety Rating Scale developed by Max Hamilton in 1959 was used to measure anxiety, which has been translated to Indonesian language (Wati, Mardiyono, & Warijan, 2017).

Ethical consideration
This study has been approved by the Research Ethic Commission of Poltekkes Kemenkes Semarang. The researchers confirmed that each respondent has signed an appropriate informed consent.

Data analysis
Data were analyzed using paired t-test and independent t-test. Using Shapiro-Wilk, data in the experiment group (p=.13) and control group (p=.88) were normally distributed.
RESULTS

Table 1 Characteristics of respondents based on gender

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>n</td>
<td>%</td>
<td>Male</td>
<td>%</td>
</tr>
<tr>
<td>Experiment</td>
<td>8</td>
<td>53.3</td>
<td></td>
<td>7</td>
<td>46.7</td>
</tr>
<tr>
<td>Control</td>
<td>8</td>
<td>53.3</td>
<td></td>
<td>7</td>
<td>46.7</td>
</tr>
</tbody>
</table>

Table 1 shows that the number of respondents based on gender in the experiment and control group was equal, which consisted of 8 females (53.3%) and 7 males (46.7%). Based on table 2 it can be concluded that the most respondents in the experiment group were in the age group of 60-69 years as many as 9 respondents (60%), while in the control group, age of respondents at most in the range of 50-59 years as many as 6 respondents (40%).

Table 2 Characteristics of respondents based on age

<table>
<thead>
<tr>
<th>Age group</th>
<th>Experiment</th>
<th></th>
<th>Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>30-39</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td>40-49</td>
<td>5</td>
<td>33.33</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>50-59</td>
<td>1</td>
<td>6.67</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>60-69</td>
<td>9</td>
<td>60</td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td>70-79</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>80-89</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6.67</td>
</tr>
</tbody>
</table>

Table 3 Frequency distribution of anxiety before and after given intervention in the experiment and control group

<table>
<thead>
<tr>
<th>Anxiety level</th>
<th>Experiment group</th>
<th></th>
<th></th>
<th></th>
<th>Control group</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>Severe</td>
<td>4</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>11</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>0</td>
<td>14</td>
<td>93.33</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>No anxiety</td>
<td>0</td>
<td>1</td>
<td>6.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that the level of anxiety of patients in the experiment group before intervention was in the severe category (26.67%) and moderate category (73.33%), but after intervention the level of anxiety became mild category (93.33 %) and no anxiety (6.7%). While in the control group the level of anxiety of patients before intervention was in severe category (80%) and moderate category (20%), and after intervention all respondents were in moderate category (100%).
Table 4 Anxiety level of the experiment and control group

<table>
<thead>
<tr>
<th>Group</th>
<th>Anxiety level Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment group</td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>29.33±6.11</td>
</tr>
<tr>
<td>Posttest</td>
<td>9.00±3.00</td>
</tr>
<tr>
<td>Control group</td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>29.47±2.00</td>
</tr>
<tr>
<td>Posttest</td>
<td>17.73±2.63</td>
</tr>
</tbody>
</table>

Table 4 shows that the mean level of anxiety in the experiment group before intervention was 29.33 and decreased to 9 after intervention, while in the control group the mean level of anxiety before intervention was 29.47 and decreased to 17.73 after intervention.

Table 5 shows that paired t-test obtained p-value 0.000 (<0.05), which indicated that there was a significant effect of spiritual nursing care on anxiety levels in the experiment group. Similar with the control group, there was a significant effect of intervention on anxiety levels.

Independent t-test in the table 6 shows that there was a significant difference of the mean level of anxiety between the experiment and control group (p=0.000), which indicated that there was a higher decrease of anxiety level in the experiment group compared with the control group.

Table 5 Differences of anxiety levels before and after intervention between experiment and control group using Paired t-test (n=30)

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean ± SD</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>20.33±4.73</td>
<td>16.65</td>
<td>0.000</td>
</tr>
<tr>
<td>Control</td>
<td>11.73±2.31</td>
<td>19.64</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 6 Mean difference of anxiety level before and after intervention between experiment and control group using Independent t-test (n=30)

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean ± SD</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>20.33±4.73</td>
<td>6.33</td>
<td>0.000</td>
</tr>
<tr>
<td>Control</td>
<td>11.73±2.31</td>
<td>6.33</td>
<td>0.000</td>
</tr>
</tbody>
</table>

DISCUSSION

The results showed that there was a decrease of anxiety levels in both groups with the mean difference value in the experiment group was 20.33 and control group was 11.73. There was a statistically significant difference in anxiety level between the experiment and control group after given intervention. It proves that spiritual nursing care could decrease the level of anxiety in patients with stroke.

Spiritual nursing care done by nurses in this study reflects attitudes, actions or behaviors in caring activities such as assisting, listening, communicating, giving a verbal and nonverbal touch, being empathy, conscience, commitment, confidence and competence with the aim that patients will not feel alone, but feel welcome, understood, and be open to express feelings and make them have hope. This is also in line with caring's theory of Swanson which considers human as spiritual
beings (Alligood, 2014), and also caring dimension (Branch, 1999).

Spiritual nursing care refers to supporting the fulfillment of spiritual needs, so that the patient has the energy and has a better coping mechanism. The spiritual connection of the post-stroke patient can affect his ability to adapt to stroke, increase motivation, hope and self-confidence (Sammarco, 2016). Spirituality is the energy that can produce balance in the body, mind and spirit (Doreen, 2016), so that the energy can be focused inside to protect and strengthen positive thinking, and can be used creatively to achieve balance and move or improve adaptation mechanisms so as to facilitate wellbeing and healing from within or inner healing (Doreen, 2016).

Spirituality ultimately results in a relaxed response, which is a resting state from physiological and psychological functions. This condition is indicated by a decrease in central nervous system activity that affects the decreasing heart rate, respiratory rate, blood pressure, muscle tension, brain activity, and increased skin temperature (Lewis et al., 2016).

The results of this study was in line with previous study revealed that spiritual care can reduce anxiety in pre-operative patients (Wulandari, 2013). Another study said that spiritual program can promote spiritual welfare (Moeini, Ghasemi, Yousefi, & Abedi, 2012). In addition, spiritual care could affect anxiety in patients with cancer (Torabi, Sajjadi, Nourian, Borumandnia, & Farahani, 2017).

This study provides the insight of knowledge about spiritual nursing care activities, which is expected to support spiritual fulfillment in stroke patients using nursing theory but can be universally administered by nurses regardless of religion, but when it comes to meeting the needs of religion the nurse also can still facilitate it, such as closing the equipment necessary for the needs of prayer / worship, reminding the time of prayer referring to religious leaders when necessary. So, the spiritual support that nurses can independently have can be aimed at stimulating the patient to find or re-enforce his or her relation to awaken and reconnect either with oneself, others or with a higher power or God (Brunner, 2010), as well as to find the meaning or purpose in life and be able to adapt to chronic illness and improve quality of life (Perry & Potter, 2005).

CONCLUSION

Based on the result of this study, it can be concluded that there was a significant effect of spiritual nursing care on anxiety levels in patients with stroke. This intervention should be recommended for nurses to apply spiritual approach in their nursing care.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

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COMBINATION OF HYPNOSIS THERAPY AND RANGE OF MOTION EXERCISE ON UPPER-EXTREMITY MUSCLE STRENGTH IN PATIENTS WITH NON-HEMORRAGHIC STROKE

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Abstract
Background: Range of Motion (ROM) exercise has been identified in the literature that it has an effect in improving muscle strength, especially in patients with stroke. However, little is known about the effect of ROM exercise combined with hypnosis therapy. 

Objective: To determine the effect of combination of hypnosis therapy and ROM exercise on upper extremity muscle strength in patients with non-hemorrhagic.

Methods: This study employed a quasi-experiment with pretest-posttest control group design. Thirty-two samples were selected using simple random sampling, which 16 randomly assigned in the experiment and control group. Muscle strength was measured using muscle strength scale. Hypnosis Deepening test was used to measure the level of hypnosis depth. Paired t-test and Independent t-test were used for data analysis.

Results: The mean value of muscle strength in the experiment group was 3.50 and the mean value in the control group was 2.62. Independent sample t-test obtained p-value = 0.012, indicated that there was a statistically significant difference in the mean of muscle strength of upper extremity in the experiment and control group. Paired t-test obtained p-value = 0.000, which indicated that there was significant difference between the average of muscle strength value before and after treatment.

Conclusion: The combination of hypnosis therapy and ROM exercise has a significant effect in increasing muscle strength of upper extremity in patients with stroke non-hemorrhagic.

Keywords: stroke; hypnosis; muscle strength; ROM

INTRODUCTION

Stroke as a cardiovascular disease is a sudden neurologic disorder that occurs due to impaired blood flow due to blockage or rupture of blood vessels in the brain (Gofir, 2009). The incidence of stroke in Indonesia is 7 per 1,000 population (MOH, 2013). Stroke is divided into two, namely ischemic stroke and hemorrhagic stroke. Ischemic stroke occurs because the blood flow to the brain stops due to atherosclerotic or blood clots that clog the blood vessels, while hemorrhagic stroke is caused due to the occurrence of bleeding so that blood flow becomes abnormal, and blood that comes out occupy an area in the brain (Junaidi, 2006).

The main problem of stroke patients is paralysis or muscle weakness at a point or multiple sites from the control circuitry of the motor neuron cells to the muscle fibers. The
The most common long-term ability deficit due to stroke is hemiparesis (Lewis, Heitkemper, Dirksen, O'Brien, & Bucher, 2010). Hemiparesis and hemiplegia are a form of motor deficits that can cause a patient to decrease mobility. This immobilization condition will result in the patient experiencing complications and deficits of ability to perform daily activities, such as doing his/her work, interaction and role of self at home and social environment.

The cause of death in Indonesia is one third caused by stroke. Stroke has the highest incidence rate of 10.8%, followed by coronary heart disease 4.4% and heart failure 0.25%. The prevalence of stroke diagnosed by health professionals’ group and those diagnosed with stroke symptoms increased with age, the highest at an average age of 70 years (43.1% and 67%). Stroke tends to be higher in people with low education either diagnosed by health professionals (16.5%) or diagnosed with stroke symptoms (32.8%). The prevalence of stroke in the city was higher than in the village, diagnosed by health professionals (8.2%) and diagnosis of stroke symptoms (12.7%) (MOH, 2013).

In the General hospital of NTB in 2013 obtained 372 cases of stroke and 39 people died (10.48%). In 2014 stroke cases as many as 264 people and 39 people died (14.77%), and in 2015 cases of stroke increased significantly compared to two years earlier, as many as 530 people consisting of 280 males (52.84%) and 250 females (47.16%), and 142 people died (26.79%).

Preliminary study results conducted in the medical rehabilitation room, obtained an average of stroke patients as many as 15-20 people treated per day. From the number of patients experiencing problems with decreased muscle strength and limited range of extremity motion, both in the form of weakness to move the hands and feet on one part of the body both right and left, and intervention has been given by the nurse is the Range of Motion (ROM).

Self-care intervention however includes Range of Motion (ROM) exercises and hypnosis in stroke patients. ROM exercise therapy is the provision of motion training intervention to stroke patients with impaired motor function by moving the leg up, down, left, right and spin. Motion exercise with ROM is done 2 times daily for 3 days, which each session is done for 30 minutes. Previous research revealed that passive ROM performed two times per day for 7 days has a significant effect in increasing muscle strength in stroke patients (p=0.000) (Mawarti, 2012). Similar with another study indicated that ROM performed two times a day for 7 days, with 45-60 minutes per session could increase muscle strength 1.70 (34%). The other study showed significant improvement in muscle strength 3.87 (55%) after passive exercises 5 times a day with a duration of 10 minutes for 8 days (Sikawin, Mulyadi, & Palandeng, 2013).

On the other hand, hypnosis therapy in stroke patients is a therapy with progressive relaxation techniques that will stimulate hormones affecting a person to be more comfortable, such as the neuropeptide hormone. This hormone will be produced when one feels deep relaxation. The technique will also stimulate the Theta system in the body, which this hormone plays for physical relaxation and emotional health. The other hormones include endogenous hormones, benzodiazepines, anamides, melatonin and N N–Dimethyltryptamine (Rama & Napri, 2015). Hypnosis is also useful for increasing range of motion, increasing grip strength and reducing muscle spasms (Diamond, Davis, Schaechter, & Howe, 2006).

Previous study showed that hypnosis in patients post-stroke could reduce muscle tension, as well as stabilize emotions, behaviors and motivations in the improvement of healing efforts. Hypnosis therapy also speed up the healing process of the patient with cancer and heart attack. This is possible because hypnosis therapy can be aimed at improving the immune system and reprogramming the individual's attitude in...
dealing with his illness (Rama & Napri, 2015).

However, the combination of hypnotic therapy and ROM exercises could be more useful. Hypnosis can change the sensation, perception, thought, feeling or behavior after being given suggestions; and also useful in reducing anxiety and insomnia, controlling high blood pressure, decreasing depression, and reducing fatigue (Ng & Lee, 2008).

While ROM exercises have the benefit of determining the value of bone and muscle joint ability in performing movement, improving muscle tone, improving muscle tolerance for exercise, preventing joint stiffness, and improving blood circulation. Range of Motion (ROM) is an exercise performed to maintain or improve the level of perfection of the ability of joint movement in a normal and complete way to increase muscle mass and muscle tone (Rama & Napri, 2015).

Nowadays, standard therapy used for rehabilitation in stroke patients only focuses on motion exercises and physical improvement of the patient. Therefore, selection of combination of hypnosis therapy and early ROM training is expected to increase muscle strength because it can stimulate the motor as well as increase muscle strength. Besides, little is known about the combination of both interventions. This study aimed to examine the effect of combination of hypnosis therapy and ROM exercise on changes in upper strength muscle strength in patients with non-hemorrhagic stroke.

METHODS

Study Design
This study employed a quasi-experiment with pretest-posttest with control group design.

Sample
The target population in this study was all patients with non-hemorrhagic stroke in the Medical Rehabilitation Ward of the General Hospital of Mataram. Thirty-two samples were selected using simple random sampling, which 16 randomly assigned in the experiment and control group. The inclusion criteria of the sample were 1) stroke patients with impaired motor function, with a minimum Medical Research Council (MRC) score of 1 (Muscle Weakness), 2) patients aged ranging from 17 to 50 years, 3) non-hemorrhagic stroke, 4) patients with full awareness (GCS 13-15), and 5) patient's family approved the patient to be the respondent by signing the informed consent. The exclusion criteria included: 1) patients who used ventilator, 2) patients with hearing loss, and 3) patients with ear trauma.

Intervention
Intervention was conducted by the researchers themselves (certified by Indonesian Board of Hypnotherapy), assisted by a professional physiotherapist who works in the medical rehabilitation ward at least 5 years. The intervention started from adjusting the patient's sitting position, and guiding the patient to the relaxation process at a mild trans phase (measured by hypnosis deepening test). The researcher gave positive suggestion and motivation to the patient to be more focused, optimistic and enthusiastic in the process, such as "from now on and on anytime and anywhere during this therapy session, you realize that you are getting excited to follow every part of this therapy that you believe it can help your healing". Patients were given ROM exercises by physiotherapists on body parts that experience muscle weakness. After given motion exercises, the patient was relaxed as in the early stages then the researcher guided the patient to imagine the movement in the healthy arm / leg and then suggested to feel or imagine that the arm / paresis also moved repeatedly for up to 10 minutes, after that the patient was then trained independently to perform mild movements on the body parts that experience weakness, then patients were given suggestions back to be more optimistic and enthusiastic in undergoing the therapy process. Hypnosis therapy and ROM were done 2 times a day for 3 days.
**Instrument**

There are two instruments used in this study as the following:

1. **Muscle Strength Scale**

   Assessment of muscle strength was performed using a scale of muscle strength measurements developed by the Medical Research Council (MRC) (Lumbantobing, 2000). Muscle strength is expressed with the scale of 0-5, namely: 0 = total paralysis; no muscle contraction at all; 1 = there is a slight muscle contraction, but no motion in the joint moved by the muscle; 2 = gained motion, but this motion is not able to resist gravity; 3 = can hold the movement against gravity; 4 = being able to resist gravity and overcome a little resistance; 5 = no paralysis (normal). This scale is often used to measure motor weakness and see progress over time in weakened muscle strength. Muscle strength can be described as the ability of the muscle to withstand both the external and internal force. Muscle strength is closely related to the neuromuscular system that is how much the ability of the nervous system to activate the muscles to perform contractions. Assessment of muscle strength has a measurement scale commonly used to check paralyzed patients. In addition, it is also used to see whether there is progress obtained during treatment or deterioration in patients. Researchers used the same muscle strength assessment sheets used by previous researcher. While the measurement of the muscle strength was done by a professional physiotherapist.

2. **Hypnosis Deepening Test**

   It is a test to see how far the subject's consciousness has moved from conscious mind to sub conscious mind. The depth of each person is different and highly dependent on the subject's condition, his understanding of hypnosis, time, environment and skill of the hypnotist or therapist. Based on Davis-Husband Scale (Wong & Hakim, 2009), levels of hypnosis depth can be divided into 30 levels. Depth requirement also has different intent and purpose in hypnosis process. Patients were observed based on the objective symptoms shown by the patient during the hypnosis process:

![Figure 1 ROM Exercise](image-url)
Table 1 The depth of hypnosis influence with scores and objective symptoms based on The Davis Hypnotic Susceptibility Test

<table>
<thead>
<tr>
<th>Depth</th>
<th>Score</th>
<th>Objective symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insusceptible</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Hypnoidal</td>
<td>1</td>
<td>Relaxation</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>The eyelid vibrates</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Fluttering and closing of the eyes</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Closing the eyes</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Perfectly physical relaxation</td>
</tr>
<tr>
<td>Light trance</td>
<td>6</td>
<td>The eyelids cannot be opened again</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Limb and arm catalepsy</td>
</tr>
<tr>
<td></td>
<td>8,9,10</td>
<td>Tense catalepsy</td>
</tr>
<tr>
<td></td>
<td>11,12</td>
<td>Gloves anesthesia</td>
</tr>
<tr>
<td>Medium trance</td>
<td>13,14</td>
<td>Partial amnesia</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Anesthesia posthypnotic</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Personality changes</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Posthypnotic simple suggestion</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Kinesthetic</td>
</tr>
<tr>
<td>Deep trance</td>
<td>21</td>
<td>Able to open eyes, without trance disturbed</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>Posthypnotic suggestions are strange</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>Complete somnambulism</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>Posthypnotic positive visual hallucination</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>Posthypnotic positive auditory</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>hallucination,</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>Systematized auditory amnesias</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>Negative auditory hallucination</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative visual hallucination</td>
</tr>
</tbody>
</table>

Data Analysis
Data processing and analysis used SPSS. Univariate data analysis was described with frequency distribution table, while bivariate analysis (normal data distribution) used paired t-test and independent t-test with significance value <0.05.

Ethical Consideration
The study has been approved by NTB Provincial Hospital (Approval number 070/77 RSUDP / 2017). Prior to data collection, each respondent was asked to sign informed consent and explained about the purpose, benefits and research procedures.

RESULTS
In the table 1 it is known that in the experiment group the number of respondents who had improvement of upper limb muscle strength was 8 respondents and recovered (muscle strength ≥ 4) as many as 8 respondents, and on the range of motion all respondents (16 participants) experienced improvement. While in the control group only 2 respondents had improved upper extremity muscle strength and only 9 respondents showed improvement of upper extremity motion range.

Table 1 Frequency distribution of the characteristics of respondents based on age, gender, and frequency of stroke

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experiment</th>
<th>Control</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean ± SD)</td>
<td>(54.06 ± 3.974)</td>
<td>(53.8 ± 3.775)</td>
<td></td>
</tr>
<tr>
<td>40 – 59</td>
<td>13</td>
<td>15</td>
<td>0.83</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Table 2 Frequency distribution of upper extremity muscle strength before and after given intervention in the experiment and control group

<table>
<thead>
<tr>
<th>Upper extremity muscle strength</th>
<th>N</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Min – Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td></td>
<td>Experiment</td>
<td>2.44</td>
<td>0.96</td>
<td>1 – 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.50</td>
<td>1.03</td>
<td>1 – 4</td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td>Experiment</td>
<td>3.50</td>
<td>0.89</td>
<td>2 - 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.62</td>
<td>0.96</td>
<td>1 - 4</td>
</tr>
</tbody>
</table>

Table 2 shows an increase in the average of upper extremity muscle strength of 1.062 in the experiment group between pretest and posttest, which muscle strength average before intervention was 2.44 with standard deviation of 0.964, and after intervention was 3.50 with standard deviation of 0.894. In the control group there was a slight difference in the mean of muscle strength, which was 2.62 with the standard deviation of 0.957 in posttest and 2.50 with standard deviation of 1.033 in pretest.

Table 3 Mean difference of upper extremity muscle strength before and after given intervention in the experiment and control group using Paired t-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Intervention</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>% Improvement</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle strength</td>
<td>Experiment</td>
<td>Pretest</td>
<td>16</td>
<td>2.44</td>
<td>0.96</td>
<td>43.44%</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td></td>
<td>3.50</td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difference</td>
<td></td>
<td>1.06</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>Pretest</td>
<td></td>
<td>2.50</td>
<td>1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Posttest</td>
<td></td>
<td>2.62</td>
<td>0.96</td>
<td>4.8 %</td>
<td>0.162</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difference</td>
<td></td>
<td>0.13</td>
<td>0.34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 above shows that the intervention of combination of hypnosis therapy and ROM exercise twice a day for 30 minutes within 3 days increase upper limb muscle strength by 1.06 (43.44%). Paired t-test obtained p-value = 0.000, which indicated that there was significant difference between the average of muscle strength value before and after treatment in the intervention group.
**Table 4** Mean difference of upper extremity muscle strength after given intervention in the experiment and control group using Independent t-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle</td>
<td>Experiment</td>
<td>16</td>
<td>3.50</td>
<td>0.89</td>
<td>2.67</td>
<td>0.012</td>
</tr>
<tr>
<td>strength</td>
<td>Control</td>
<td>16</td>
<td>2.62</td>
<td>0.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td></td>
<td></td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 shows the mean values of muscle strength in the experiment group (3.50) was higher than the mean value in the control group (2.62). Independent sample t-test obtained p-value = 0.012, which indicated that there was a statistically significant difference in the mean of muscle strength of upper extremity in the experiment and control group.

**DISCUSSION**

Findings of this study showed that there was a significant change in muscle strength of upper limb in the experiment group between before and after given the combination of hypnosis therapy and ROM exercise, with effect size of 1.37 considered very strong effect. This effect is higher compared with the effect size of the intervention in other studies.

The average of the improvement of muscle strength in the experiment group was 43.44%, higher than the muscle strength in the control group. This study provides the evidence that the combination of hypnosis therapy and ROM exercise is more effective compared with hypnosis therapy or ROM exercise alone.

The effect of hypnosis therapy combined with ROM exercise threat the stroke patients holistically, which is not only focusing on physics, but also mind (Mawarti, 2012). Hypnosis changes the sensation, perception, thought, feeling or behavior after being given suggestions (Rama & Napri, 2015); while ROM exercises have the benefit of determining the value of bone and muscle joint ability in performing movement, improving muscle tone, improving muscle tolerance and blood circulation (Sikawin et al., 2013).

Basically, the mechanism of hypnosis is central to the direct effect of the central nervous system of the human brain and various organs surrounding the organ, following the physiological pathway physiologically (Prabowo, 2009). The optimal process of hypnosis done on superficial organs is dominantly regulated by the brain, and the muscle structure that wraps the human body from the outside is the dominance of skeletal muscle with the regulation of the system, which is set completely by the brain (Prabowo, 2009).

In hypnosis therapy, there is a hypnotic suggestion which one of them is ideomotor suggestion for body movement. Ideomotor suggestion is divided into two types, the first is a direct suggestion that facilitates motor movement such as the suggestion of hand movements to be more severe and ultimately cannot lift, and the second type is a challenge suggestion which is a type of suggestion that inhibits motor activity, such as when suggestions for the client to have arm stiff and cannot bend (Kihlstrom, Glisky, McGovern, Rapcsak, & Mennemeier, 2013).

During the process of hypnosis, a person's body will feel relaxed, while his mind is very focused and attentive, which is called as the critical factor (CF) or reticular activating system (RAS), is open and unwittingly all information enters the underlying mind consciously unfiltered and become our life program. Conducting a self-program is to bypass the critical factor or penetrate the critical filter and directly communicate with the subconscious mind. By penetrating this critical filter, the conscious mind is deactivated so that the suggestions will be more effective (Kihlstrom et al., 2013).
Findings of this study will support previous studies which revealed that there was significant effect of hypnosis therapy and ROM exercise on upper extremity muscle strength in stroke patients. As this study only focused on upper extremity muscle strength, thus further study is needed to examine the effect of the combination of hypnotherapy and ROM exercise on lower extremity muscle strength or applied in patients with hemorrhagic stroke. Different setting may be also needed as this study was only in the medical rehabilitation.

CONCLUSION

It can be concluded that the combination of hypnosis therapy and ROM exercise has a significant effect in increasing muscle strength of upper extremity in patients with stroke non-hemorrhagic. This intervention could be applied as a nursing intervention to give a nursing care comprehensively.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

References
EFFECT OF FAMILY PSYCHOEDUCATION ON CAREGIVER SUPPORT IN THE TREATMENT OF PATIENTS WITH TYPE II DIABETES MELLITUS

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Abstract
Background: Diabetes Mellitus is a chronic disease that requires treatment for long periods of time so it can cause physical and psychological problems for sufferers and families (caregiver). Caregiver's role is expected to provide support for people with diabetes mellitus. Family psychoeducation is a strategy that can be applied for caregiver in overcoming problems that arise during the treatment of patients with diabetes mellitus.
Objective: This study aims to determine the effect of family psychoeducation on caregiver support in the treatment of patients with type II diabetes mellitus.
Methods: This research used a quasi-experiment with pre-test post-test control group design. A total of 46 caregivers and patients with diabetes mellitus were recruited purposively, with 23 respondents assigned in the experiment and control group. Caregiver support scale was used to measure caregiver support, and Hensarling Diabetes Family Support Scale (HDFSS) for measuring perception of patients toward the treatment of caregiver. Data were analyzed using paired t-test and independent t-test.
Results: Findings showed there was an increase of caregiver knowledge from 5.39 to 9.09 and an improvement of caregiver treatment from 40.30 to 67.04 after given family psychoeducation. There was a significant difference of caregiver support in the experimental and control group with p-value <0.001 (<0.05).
Conclusion: Family psychoeducation can increase caregiver support in the treatment of diabetes mellitus patients. The intervention can be one of nurses’ interventions in the empowerment of family in improving the treatment of chronic diseases, particularly in diabetes mellitus.

Keywords: caregiver support; family psychoeducation; diabetes mellitus

INTRODUCTION

Family support is an aid given by other family members so it will provide physical and psychological comfort (Taylor, 1999). Family support is an important factor in the compliance of chronic disease management including diabetes mellitus. Family caregiver support is the most powerful indicator to have a positive impact on self-care in patients with diabetes mellitus (Hensarling, 2009).

Diabetes Mellitus is one of the global problems because the prevalence of patients...
from year to year is increasing. International Diabetes Federation (IDF) data in 2014 showed a total of 387 million (8.3%) of people suffering from diabetes mellitus worldwide. While the prevalence of diabetes mellitus in Indonesia has increased from 1.1% in 2007 to 2.1% in 2013 (MOH, 2013).

The increasing number of patients with diabetes mellitus is influenced by economic development, lifestyle changes such as dietary changes and lack of exercise activity, inefficient patient self-management, and ineffective family support (Sujaya, 2009; Tiokroprawiro, 2003; Trisnawati & Setvorogo, 2013; WHO, 2006). However, these patients experience many problems, including psychological problems such as loss of welfare, independence, sense of comfort, loss of fiscal and mental function, self-concept and family or community role. These conditions cause anxiety in the patient and depression in the family (caregiver) (Given, Sherwood, & Given, 2008). It could be said that diabetes mellitus causes deep psychological changes in patients, families and social groups (Punkkinen et al., 2008).

The role of the family is an important factor in the treatment of diabetes mellitus (Goldberg & Rickler, 2011). Families as caregivers should be able to perform good and proper parenting tasks in the treatment of diabetes mellitus. The caregiver family acts as a coordinator by administering diabetes mellitus diet, drug management and dietary compliance; and act as a motivator in physical exercise and blood sugar monitoring, as well as the passive supervisors by early detection of signs of complications (Allender, Rector, & Warner, 2013). Duties and responsibilities as a caregiver family of diabetes sufferers provide the consequences of the amount of time consumed to provide care to people with diabetes. Routine family assistance includes taking medication (30%), blood tests (22%), insulin injections (11%), housework (82%), cooking or preparing food (66%) and transportation problems (56%) (Sinclair, Armes, Randhawa, & Bayer, 2010). This can last a lifetime if it is associated with the characteristic of diabetes disease (Cherny & Christakis, 2011). Caregiver should be there at any time when diabetes mellitus sufferers need help. This process will take a lot of time to make the caregiver experience psychological stress arising from physical exhaustion, burnout, and thinking about the cost of living and treatment. However, behavior change in patients, financial problems, inadequate support, full tasks and sleeping difficulties become a source of distress for caregiver (Pierce, Thompson, Govoni, & Steiner, 2012).

A caregiver feels burdened when caring for a patient. A total of 30 - 40% caregiver experience greater psychological stress than patients. Caregivers who are involved in treatment in patients with chronic conditions tend to feel tired, isolated and overwhelmed. Female caregivers have higher levels of stress and burden than male caregivers because females have more work hours and most of the time used for parenting (Pinquart & Sörensen, 2006).

Various interventions can be done to increase the knowledge and skills of patients with diabetes mellitus such as Diabetes Self-Management Education, CBT (Cognitive Behavior Therapy), Health education and etc. However, these interventions focus only on improving patient knowledge alone. Family Psychoeducation therapy is the provision of education and wider programs to families to reduce the manifestation of conflict and change the pattern of family communication in problem solving (Townsend & Morgan, 2017). The basic concept of its management is fast, logical, beneficial, and affordable by treating all family members in a relationship system rather than the individualized concentration. Family psychoeducation therapy gives benefits to families and patients, such as the ability to care for patients and overcome related problems, while patients indirectly get optimal care from the family (Townsend & Morgan, 2017)

Several studies have shown family psychoeducation therapy has proved effective.
in providing a positive impact in the family. It can also improve family dynamics and decrease family conflicts (McBroom & Enriquez, 2009). Family-based therapy is essential for changes in diet-related adherence, glucose control, increased diabetes-related knowledge and glucose control.

The results of interviews conducted in September 2016 on 10 patients with type 2 diabetes mellitus and their families found that three patients said they rarely control to the health center because no one to deliver, five patients said less attention by family ranging from lack of control, diet and exercise, while two patients said they were bored with the illness suffered and felt the burden of the family. While the results of interviews with the family found as many as 5 families said that they did not understand about the correct treatment of diabetes, three families said that they rarely paid attention to the patient because of busy working such as preparing food, and two families said they were bored and tired of caring for patients in the long term.

Family caregiver support is a help given by other family members to provide comfort both physically and psychologically. Family caregiver support is one of the most powerful indicators in impacting the care of patients with diabetes mellitus. Family support is divided into four dimensions including emotional, reward, instrumental and participation (Hensarling, 2009). Numerous studies on the role of families in the treatment of diabetes have been done, but little is known about the research on understanding the psychological condition of caregiver family and their needs. Families are directly or indirectly required to be responsible for providing physical, social, emotional, and financial support. They often ignore their own needs, never get any intervention and recognition, lack the support of the environment, and rarely get the financial reimbursement of the cost of treatment of the family members (Goldberg & Rickler, 2011). The purpose of this study was to identify the influence of family psychoeducation on caregiver support in the treatment of patients with diabetes mellitus type II.

METHODS

Study design
This research used a quasi-experiment with pre-test post-test control group design.

Sample
A total of 46 caregivers and patients with diabetes mellitus were recruited purposively from the Prolanis program data at the Health Center of Bendo. The inclusion criteria of caregiver were (1) living together in one house with patient, (2) selected by patients, (3) female, (4) aged 34 - 50 years, (5) able to read, write and speak Indonesia, (6) willing to participate fully during therapy, (7) having at least elementary educational background and maximum high school or equivalent. The inclusion criteria of the patient were (1) long suffering from diabetes mellitus at least 1 year, (2) no complications of heart and kidney failure, (3) no blindness and hearing loss. The research was conducted in the working area of Bendo Public Health Center of Kediri Regency, Indonesia.

Instrument
Caregiver support variable was assessed from the caregiver dimension consisting of 10 questions, and caregiver treatments consisting of 18 statements. The type of questionnaire used was a self-developed questionnaire with an interval scale. The validity of the scale used Pearson Product Moment correlation with the result that the result of r-value was greater than r-able (df = n-2 = 22-2 = 19, r-table = 0.423), while reliability test showed Cronbach's Coefficient-Alpha of 0.932.

The perception of patients on caregiver support was measured using the Hensarling Diabetes Family Support Scale (HDFSS) (Hensarling, 2009) that has been translated into Bahasa Indonesia (Yusra, 2011). This questionnaire consisted of 25 closed questions.
**Intervention**

The psychoeducation module used was a module developed by a nursing specialist association. Content expert validity was done to ensure that the content in the module was appropriate and fit with the cultural context of patients with diabetes mellitus in Indonesia. Family psychoeducation consisted of 5 sessions, which each session took 30 - 45 minutes. Prior to the program, the researchers first divided the group that each group consisted of 4 - 5 caregivers. The first session was a review of the problems that often arise during the treatment of diabetes mellitus patients. The second session was the treatment of people with diabetes mellitus at home. The third session was the stress management experienced by caregiver during the treatment. The fourth session was the management of family burden during the treatment, and the last was the empowerment of community facilities in the health sectors (e.g. community health center or hospital). Family psychoeducation interventions were conducted every 1 session on a weekly basis by a method of discussion between researchers and caregivers. While control group was given an intervention based on the standard from the community health center, which was health education about diabetes mellitus patient’s care at home. The media used were psychoeducation module and DM patient care booklet at home.

**Data analysis**

Paired t-test was used to examine the effect of psychoeducation therapy on caregiver support, and Independent t-test was used to examine the difference of caregiver family support after given intervention between the experiment and control group.

**Ethical consideration**

All respondents both caregivers and patients have obtained an explanation of the purpose and benefits of the study and signed informed consent. This study has been approved by the Medical Research Ethics Commission of Faculty of Medicine of Diponegoro University and the General Hospital of Dr Kariadi Hospital Semarang.

**RESULTS**

Table 1 shows that most caregiver’s educational levels in the experiment and control group was senior high schools, which was 52.17% of respondents in the control group and 65.22% in the experiment group. The majority of respondents in both groups had income lower than 1,540,000,61 IDR based on the calculation of family income each month. Most of them worked as housewives, and more than 80% of them have been exposed with DM-related information.

| Table 1 Characteristics of respondents based on age, level of education, income of caregivers, caregiver job, and exposure to DM-related information |
|----------------------|-------------------|-------------------|
| Variable             | Experiment (n = 23) | Control (n = 23)  |
|                      | f | %    | f | %    |
| Level of Education   |   |      |   |      |
| Elementary school    | 4 | 17.39 | 6 | 26.09 |
| Junior high school   | 5 | 21.74 | 5 | 21.74 |
| Senior high school   | 15| 65.22| 12| 52.17 |
| Income of Caregiver  |   |      |   |      |
| ≥ 1,540,000,61 IDR   | 11| 47.83| 10| 43.48 |
| < 1,540,000,61 IDR    | 12| 52.17| 13| 56.52 |
| Caregiver Job        |   |      |   |      |
| Private              | 3 | 13.04 | 4 | 17.39 |
| Entrepreneur         | 5 | 21.74 | 7 | 30.43 |
| Farmer               | 2 | 8.70  | 5 | 21.74 |
| Housewife            | 13| 56.52| 11| 47.82 |
| Exposure to DM-related information |   |      |   |      |
| Yes                  | 21| 91.30| 19| 82.60 |
| No                   | 2 | 8.30 | 4 | 17.40 |

Table 2 Caregiver age and length of time caring for diabetes mellitus

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experiment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Caregiver age</td>
<td>45.56</td>
<td>5.194</td>
</tr>
<tr>
<td>Length of time caring for DB</td>
<td>4.61</td>
<td>1.839</td>
</tr>
</tbody>
</table>

Based on Table 2, it was found that the mean age of caregiver in the experimental group was 45.56 years with a standard deviation of 5.194 years, with the youngest age in the experimental group was 34 years old and the oldest age was 50 years. While the mean age of caregiver in the control group was 44.52 years with a standard deviation of 4.077 years, with the youngest age in the control group was 38 years old and the oldest age was 50 years. The average length of care for DM patients in the experimental group was 4.61 years and in the control group was 4.26 years.

Table 3 Perception of DM patients in receiving caregiver treatment before and after given psychoeducation

<table>
<thead>
<tr>
<th>Perception of DM patients</th>
<th>Mean</th>
<th>SD</th>
<th>Pre</th>
<th>Post</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>69.4</td>
<td>82.8</td>
<td>6.991</td>
<td>4.488</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>65.2</td>
<td>69.7</td>
<td>5.250</td>
<td>5.536</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that the mean value of the perception of DM patients in the experiment group before the intervention was 69.4, and increased to 82.8 after the caregivers received psychoeducation intervention. While the mean value of perception of DM patients in the control group before the intervention was 65.2, and increased slightly to 69.7 after the caregivers received health education intervention. While Table 4 shows that in the control group the mean value of caregiver knowledge before intervention was 5.67 and the mean value of caregiver treatment was 35.96; and after intervention there was an increase of knowledge to 7.17 and caregiver treatment to 36.06. While in the experiment group, before intervention, the caregiver knowledge was 5.39 and caregiver treatment was 40.30, and increased significantly after given psychoeducation intervention, with the mean knowledge of caregiver was 9.09 and caregiver treatment was 67.04.

Table 4 Caregiver support in caring DM patients before and after intervention (n=46)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experiment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Pre</td>
</tr>
<tr>
<td>Caregiver Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>5.67</td>
<td>5.39</td>
</tr>
<tr>
<td>SD</td>
<td>2.424</td>
<td>1.305</td>
</tr>
<tr>
<td>Min-Max</td>
<td>3-9</td>
<td>3-10</td>
</tr>
<tr>
<td>Caregiver treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>35.96</td>
<td>40.30</td>
</tr>
<tr>
<td>SD</td>
<td>5.121</td>
<td>3.296</td>
</tr>
<tr>
<td>Min-Max</td>
<td>34-50</td>
<td>38-60</td>
</tr>
</tbody>
</table>

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Table 5 Analysis of difference in caregiver support (knowledge and treatment)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregiver knowledge</td>
<td>Experiment</td>
<td>23</td>
<td>1.913</td>
<td>2.234</td>
<td>0.000</td>
</tr>
<tr>
<td>(Pre – Post)</td>
<td>Control</td>
<td>23</td>
<td>1.174</td>
<td>1.072</td>
<td>0.000</td>
</tr>
<tr>
<td>Caregiver treatment</td>
<td>Experiment</td>
<td>23</td>
<td>31.087</td>
<td>4.078</td>
<td>0.000</td>
</tr>
<tr>
<td>(Pre – Post)</td>
<td>Control</td>
<td>23</td>
<td>1.173</td>
<td>5.268</td>
<td>0.128</td>
</tr>
</tbody>
</table>

Table 5 shows that there was a statistically significant difference in caregiver knowledge before and after given intervention between the experiment and control group with p-value .000 (<.05). While for caregiver treatment variable, there was a statistically significant difference in the experiment group before and after given psychoeducation with p-value .000 (<.05). There was no significant difference in caregiver treatment in the control group.

Table 6 shows that there was a significant effect of psychoeducation on caregiver knowledge (p=.000) and treatment (p=.001) in the experiment group. However, there was no significant difference in caregiver treatment (p=.262) in the control group, but there was a significant difference in the caregiver knowledge (p=.001).

Table 6 Effect of psychoeducation on caregiver support in caring DM patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregiver knowledge</td>
<td>Experiment (pre-post)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Control (pre-post)</td>
<td>0.000</td>
</tr>
<tr>
<td>Caregiver treatment</td>
<td>Experiment (pre-post)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Control (pre-post)</td>
<td>0.262</td>
</tr>
</tbody>
</table>

DISCUSSION

The results of this study indicated that there were significant differences in caregiver support in the dimension of caregiver knowledge and treatment before and after given psychoeducation. This is in line with previous research revealed that psychoeducation was able to improve cognitive and psychomotor ability significantly (Putri, Harmayetty, & Utomo, 2016; Wiyati, Wahyuningsih, & Widayanti, 2010).

Psychoeducation in the experiment group was expected to be able to increase the ability of caregiver in providing care support for DM patients, because each caregiver was given the opportunity to tell the problems faced during the care of DM patients and taught how to overcome the problem as well as to provide optimal support (Shives, 2008).

This study provided the evidence that psychoeducation as the provision of education and wider programs could increase the knowledge and treatment of caregivers (family) in caring patients with diabetes mellitus. There was an increase of knowledge from 5.39 to 9.09 and increase of treatment from 40.30 to 67.04.

The effect of psychoeducation in this study is also strengthen by the perception of the patients during the treatment by caregivers. The results showed that the mean value of the perception of DM patients was increased from 69.4 to 82.8. This tells that the patients received benefits from the treatment.

This study provides the knowledge that to deal with patients with diabetes mellitus is not only focusing on health education for caregivers, but also the stress management for caregivers because they may feel stressful, bored, tired, anxiety and etc. Psychoeducation is effective in providing health education,
managing stress and understanding in utilizing health facilities (McBroom & Enriquez, 2009).

The limitation of this study might include the times for the study was too short, which might not good enough to see the effect of intervention. Further study with long time observation is needed to examine the effect of psychoeducation on caregiver supports.

CONCLUSION

It is concluded that there was a significant effect of family psychoeducation on caregiver support in caring patients with diabetes mellitus. Psychoeducation can be applied as one of nurses’ interventions in empowering family members as an effort to improve the treatment in patients with chronic diseases, especially in DM patients.

Declaration of Conflicting Interest

None declared.

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Author Contribution

All authors contributed equally in this study.

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