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To increase the visibility of students’ theses and dissertations, many higher education institutions are moving from print to Electronic Theses and Dissertations (ETDs), which is publicly available in open access repositories (Ramirez, Dalton, McMillan, Read, & Seamans, 2013). Prerequisites for this transition include the demand from faculties and students, budgetary considerations, stable online content, high image quality, guaranteed perpetual access, and discoverability of content (indexed by powerful engines and also cited) (Baskin, Newyear-Ramirez, Luther, Baskin, & Gastel, 2008). However, this movement has resulted in both pros and cons of ETDs.

Many faculty members and students think that openly accessible ETDs may diminish publishing opportunities because they are considered as prior publications (Holt, 2002; Ramirez et al., 2013) and some publishers reject ETD-derived manuscripts (McCUTCHEON, 2010). In contrast, some faculties argue that ETDs are generally accepted by publishers (Ramirez et al., 2013), which were reported by their experiences in the publication process. This issue has been asked many times by the authors to the editorial members of Belitung Nursing Journal (BNJ). Therefore, this editorial is noted to present our concerns regarding ETDs and publication ethics.

First, BNJ publishes an original work, if it is a dissertation/thesis chapter (or part of your dissertation/thesis) that has been published in electronic or paper format, it needs to be revised for publication in our journal, and should significantly fit with publishing guidelines (such as format, scope, audience, voice) to prevent the same form as a thesis or dissertation. However, you may need to obtain permission from the university to retain the right to reuse it. In other words, we welcome submission of ETDs-derived manuscripts, and it should be seen from a case-by-case basis.

Second, all submissions in our journal are subject to peer review, and frequently papers change in response to reviewers’ feedback. So, it will be completely different from a dissertation or thesis chapter.
Third, BNJ does not publish full theses or dissertations. However, for information, submission of full theses and dissertations that have been published in openly accessible ETDs to the publishers such as ProQuest or other publishers that publish theses and dissertations, then it is considered duplication or plagiarism.

Fourth, in conjunction with ETDs, we also conditionally receive an article that its abstract has been published in the conference’s book of abstract with or without ISBN (International Serial Book Number) as long as a copyright transfer agreement is signed. The published articles will be considered as “the expanded version from the conference”. However, if you think that you can revise your abstract to be completely different from the abstract submitted to the conference, or if you withdraw the abstract from the conference’s abstract book, then you do not need to sign copyright transfer agreement. In addition, the book of abstracts is totally different from a conference proceeding. The abstracts book is the compilation of abstract, while a proceeding is the compilation of full-text articles from participants in an academic conference. So, if your full-text article has been published in a conference’s proceeding, then you are ethically not able to submit to other publishers.

Fifth, if you have already published an article in one journal, and trying to submit and publish the same article in another journal using different language (a full translated article) without copyright permission, confirmation and agreement from the first publisher/journal, then it is considered duplication too.

Sixth, double submission or submitting the same manuscript to two or more different publishers / journals is ethically unacceptable. We have found several cases in BNJ during this year.

In conclusion, understanding the ethical issues regarding ETDs and publishing in a journal is essence for faculties and students to increase the awareness of the potential ethical problems that may arise in publication. However, publication policies are quite diverse among publishers, and most of them may have no ETD policy at all. At the end, we are demanded to be a “smart” scholar to think critically to prevent unethical publishing behavior in the future.

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IMPLEMENTATION OF INTERNET-BASED EMERGENCY MEDICAL SERVICE: A SOLUTION TO IMPROVE RESPONSE TIME IN OUT-OF-HOSPITAL CARDIAC ARREST AND ITS POTENTIAL APPLICATION IN INDONESIA

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Abstract
Out-of-Hospital Cardiac Arrest (OHCA) is a condition when heart stops beating in out of the hospital. The majority of OHCA leads to death because of the delay response. Emergency Medical Service (EMS) system is needed to take care of the patients carefully. The development of Internet-based EMS is one of the best solutions, which is not only to improve the response time, but also to help patients to get the ambulance immediately. The aim of this paper is to understand how the Internet-based EMS can be used and how it will affect the patients with OHCA. Our findings indicated that the Internet-based EMS with mobile web service is critically needed for immediate response of cardiac arrest and accident situation in pre-hospital condition. However, the Internet-based EMS development needs to involve inter-sectoral agencies, such as fire fighter, police, and National Search and Rescue (SAR) Agent.

Keywords: Out-of-hospital cardiac arrest; emergency medical service; Internet-based emergency medical service

INTRODUCTION

Cardiac arrest is one of the most life-threatening emergency cases and requires fast response time and good management. Without the heart compression or defibrillation used, patients with cardiac arrest will be death within minutes (Vaillancourt & Stiell, 2004). The incidence of Out-of-Cardiac Arrest (OHCA) in the United States is recorded with the 360,000 victims, accounting for 15% of all deaths annually (Sasson et al., 2013). Centers for Disease Control and Prevention (CDC) has conducted a study of cardiac arrest events in the United States during the period October 1, 2005 until 31 December 2010, and obtained approximately 31,689 cases of OHCA (Sasson et al., 2013). Of these, less than 33.3% of cardiac arrest cases received resuscitation assistance from bystanders and only 3.7% received Automated External Defibrillator (AED) support before the Emergency Medical Service (McNally et al., 2011). Emergency Medical Service (EMS) is the most important part of the entire health care system...
at the pre-hospital. EMS can improve patient’s health condition by providing optimal emergency services, developed in various medical emergencies such as heart attack, paralysis, labor, accidents, insect bites and others (Agrawal & Chavan, 2014). Currently, several organizations and governments trying to realize the importance of building a better emergency system to maintain patient’s life during injuries due to the accidents and cardiac arrest (El-Masri & Saddik, 2011). In 1998, the Australian Department of Ambulance has developed an Internet-based Medical Emergency Service, and then Singapore through the Hospital & Emergency Ambulance Link (HEAL) has also implemented a wireless data communication system between ambulances and hospitals, and providing the information to the doctors in hospitals about the patient’s condition before the patient arrived at the hospitals (El-Masri & Saddik, 2011).

Indonesia is a huge, diverse, and lower middle-income country that until recently had no internet-based EMS of pre-hospital care, included the patients with cardiac arrest. In the case of emergency in Indonesia, the patient or bystander calls the hospital emergency department to get an ambulance and professional medical personnel help. Whereas, OHCA events in several Asia-Pacific countries, including Indonesia, in the last three years amounted to 60,000 cases (Hock & Pin, 2014). This paper describes how the application of Internet-based Emergency Medical Service (EMS) to accelerate the provision of assistance in emergency cases, especially Out-of-Hospital Cardiac Arrest (OHCA) in Indonesia.

METHODS

The articles used in this literature are obtained from EBSCOHost, Google Scholar, Wiley Online Library, and ProQuest using the term “cardiac arrest”, “emergency medical service”, “out-of-hospital cardiac arrest” and “Internet-based Emergency Medical Service in lower-middle income countries”. Literature relevant to clinical pathways published from 2013 to 2015 was reviewed. These terminologies are used in combination so that the literature found is more specific.

Cardiac Arrest

Cardiac arrest is a state that the cessation of cardiac mechanical function characterized by an absence of carotid pulse, absence of breathing and decreased consciousness, that occurs very quickly (American Heart Association, 2010; Lenjani et al., 2014). Causes of cardiac arrest occur due to heart disease, circulatory disorders, respiratory problems, metabolic disorders, or poisoning (American Heart Association, 2010). The American Heart Association (AHA) at 2015 divides the incidence of cardiac arrest into 2 types, namely Intra hospital of Cardiac Arrest (IHCA) and Out-of-Cardiac Arrest Hospital (OHCA) (American Heart Association, 2015). OHCA management includes the introduction and activation of an emergency response system, subsequent quality CPR, defibrillation and referral transport also follow-up care at the hospital (American Heart Association, 2015).

Emergency Medical Service (EMS)

The focus of EMS is on emergency medical care, hospital transportation, documentation of patient condition and treatment that has been implemented by medical team or paramedics (Blackwell & Kaufman, 2002). EMS is an organized medical response and treatment system that involves many people and comprehensive system. The purpose of EMS for the patients is to perform stabilization, treatment and timely transportation to a hospital that provides necessary medical care services (Blackwell & Kaufman, 2002). EMS has a complex framework, which each component of its system has an important role as part of a coordinated system of emergency care. The EMS components include EMS organizations or public bodies, communication and transport networks, trained doctors and nurses, and people with an understanding of the emergencies (Blackwell & Kaufman, 2002).
Internet-based EMS System

Internet-based EMS is the applications that can be used by anyone located at the scene to obtain emergency services. This application system has three main parts: (1) the emergency alarm, which will provide the emergency assistance and health services from the hospital. The alarm will send emergency messages to the family, application users and nearby hospitals; (2) emergency messages including location information; and (3) medical assistance requests (Agrawal & Chavan, 2014). All methodologies are shown in Figure 1.

Overall, the Internet-based EMS has 5 main components as shown in Figure 2 (El-Masri & Saddik, 2011). The 5 components are: (1) Emergency requester device (emergency application on mobile device that has a geographical positioning system (GPS), (2) Main Central System (MCS), (3) Ambulance System (Each ambulance will be equipped with GPS system and navigation that will use the touch screen), (4)SOEHR: Smart Online Electronic Health Record, and (5) HEDS: Hospital Emergency Department System.

Figure 1 Application system (Agrawal & Chavan, 2014)

Figure 2 System and communication components (El-Masri & Saddik, 2011)
This Internet-based EMS system has two parts, namely client or user side and server (Figure 3). On the user side, all the user takes their own function, such as filling personally data, sending the emergency information, and editing the information. After that, the user’s phone will be connected with EMS server via Internet, and then server will find the hospitals that are located nearest to the user. The user will inform to the hospital about patient's location and conditions, while the hospital will provide assistance. All database management is done by EMS server (Agrawal & Chavan, 2014).

![System architecture of EMS](image)

**Figure 3** System architecture of EMS

**ANALYTICAL FINDINGS**

A total of 34 articles were obtained from our research. After screening and comparing among articles, we finally included 5 articles. The included studies described about the advantages of the implementation of Internet-based emergency system.

First study developed a software tool, the Emergency Response Community Effectiveness Modeler (ERCEM), which accepts parameters and compares the potential smartphone-initiated Samaritan/member response to traditional EMS response for a specific medical condition in a given geographic area (Khalemsky & Schwartz, 2017). From three experiments, this tool is expected to investigate anaphylaxis, hypoglycemia and opioid overdose occasions over distinctive population density characteristics, with advance stages to consider an arrangement of potential app selection levels. The study emphasizes how therapeutic condition, medicine adherence levels, community arranges participation, and population density are key variables in deciding the adequacy of Samaritan-based Crisis Reaction Communities (ERC). This study showed how effectiveness of mHealth applications for crisis reaction when compared with EMS (Khalemsky & Schwartz, 2017).

Another study identified the technological challenges that face healthcare services in terms of the EMS system (Sukkird & Shirahada, 2015). Based on a factual investigation from systematic review and the secondary data of World Health Organization (WHO) to distinguish desires of healthcare innovation related to maturing based on the benefit framework, the researchers indicated that co-creation concept in EMS system is emphatically noteworthy framework affecting
healthcare benefit development for chosen nations (Sukkird & Shirahada, 2015).

The third study is a blinded, randomized, controlled study using a mobile-phone positioning system that was activated when ambulance, fire, and police services were dispatched was used to locate trained volunteers who were within 500 m of patients with OHCA. Volunteers were at that point dispatched to the intervention group or not dispatched to the control group. The result of this study showed that a mobile-phone positioning system to dispatch lay volunteers who were trained in cardiopulmonary resuscitation (CPR) was significantly correlated with increased rates of bystander-initiated CPR among persons with out-of-hospital cardiac arrest (Ringh et al., 2015).

The fourth study used a smartphone application for locating and alerting nearby trained laymen/women in cases of OHCA and found that a smartphone application can be utilized to alert CPR-trained lay volunteers to OHCA for CPR (Berglund et al., 2018). Supported by another study, which concluded that the measurement of OHCA recognition and CPR initiation by phone should be encouraged in dispatch centers as a key to initiating corrective measures (Travers et al., 2014).

POTENTIAL APPLICATION OF INTERNET-BASED EMS SYSTEM IN INDONESIA

The successful of basic life support is depending on the chain of CPR. The first step of the chain is to activate the EMS by accessing the local EMS telephone number (Sasson et al., 2013). The latest guideline of the AHA mentioned that the application of social media technology is to call the helper near the OHCA’s patients. The impact of EMS telephone number is increasing significant score of the CPR performed by a companion with low hazard levels and large potential benefit (American Heart Association, 2015). Most OCHA events have been witnessed by the public, and immediate intervention is needed (Sasson, Rogers, Dahl, & Kellermann, 2010). The importance of integrated emergency service system, good Automated External Defibrillators (AED) and EMS provisioning access provide the good results in handling OHCA, so that the response time in cardiac arrest can be increased and the patient can be survived (Murakami et al., 2014).

The EMS application is developed to improve the quality of emergency services at the pre-hospital level, especially for OHCA events. EMS begins when an emergency services user device reports OHCA events through a simple mobile app installed on the device. The user can send quickly and easily find information about coordinates events and phone numbers to the Main Central System (MCS). After that, the mobile app will send the estimated location of the crash using GPS, and bystander and ambulance at the closest coordinates will be automatically activated. The another thing is MCS can accept the phone request if user wants to talk to the operator (El-Masri & Saddik, 2011). After the MCS receives an emergency service request from the user and again without human intervention, MCS sends requests to all bystanders, and ambulances are available to report their GPS coordinates. MCS will compare the coordinates of accidents and ambulances and send service requests to the nearest ambulance based on the map of the navigation system. The ambulance officer has 10 seconds to accept or reject the request. If the request is received, the MCS will send the event coordinates to the ambulance and bystander automatically, then the ambulance system shows the road map to the crash site while the bystander will see the location using the mobile app. Whereas if the ambulance officer declines the request or does not respond within 10 seconds, MCS will take the second nearest ambulance to the cases, assuming that within 10 seconds the ambulance position has not changed much (El-Masri & Saddik, 2011).

The speed of helper and ambulance will affect the quality of assistance provided. Research showed that sending patients using ambulances quickly to the intensive heart
hospitals to get percutaneous coronary intervention PCI services would make the patients survived. In addition, long-term responses showed the worse survival and poor neurological outcomes (Tsai et al., 2017). Another study in Spain described that OHCA helps by using mobile emergency teams could increase the patient safety (Rosell-Ortiz et al., 2017). The advantage of EMS application system compared to other systems is that the EMS system is fully computerized from start to finish and very comprehensive. In addition, the system is also capable of identifying hospitals according to the patient's conditions, and allowing communication of the patient's condition between the ambulance and the intended hospital (El-Masri & Saddik, 2011).

Despite the many advantages of this technology, there are some disadvantages of the system. First, because the system is internet-based, so it needs a good Internet network as well as a better server. In addition, the system involves many components that must be supported government systems, hospitals, and communities. So, the question is: “can it be applied in Indonesia?”

In accordance with the Decree of the Minister of Health of the Republic of Indonesia number 19 of 2016 on Emergency Management System, to realize the improvement of service quality of emergency system, the patients need an integrated system management. Integrated Emergency Management System (called as SPGDT) is an integrated and call center-based Emergency Management System using the 119 telecommunication access code by involving the community (MOH, 2016). Based on the Minister of Health's Decree, the possibility of implementing this Internet-based EMS system is very possible in Indonesia. This is because the system is more flexible and easier to use.

CONCLUSION

OHCA is a cardiac arrest that occurs outside hospital, which requires prompt relief and response time. To improve the response time and the ability of survivors to survive, a good Emergency Medical Service (EMS) service is required. The development of Internet-based EMS is one of the solutions to improve the emergency response time. This service uses a mobile-web service that has a complex component where the service involves users, servers, ambulances and hospitals as an EMS service system. This internet-based EMS application is potentially implemented in Indonesia, which an integrated Emergency Management System already exists with clear rules. It is recommended that emergency management at the pre-hospital level, especially for the OHCA cases outbreaks and accidents need to be a concern in order for the survivor to survive. The government of Indonesia needs to build the fast, flexible and efficient emergency services. The Internet-based EMS Application System should be developed by involving the police, fire department and other rescue departments, such as the National SAR Agency to align the emergency handling flow (Fahmi & Afriani, 2017).

Ethical Consideration

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Declaration of Conflicting Interest

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All authors equally contributed in this study.

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CONTRIBUTING FACTORS TO MEDICATION ERRORS AS PERCEIVED BY NURSING STUDENTS IN ILIGAN CITY, PHILIPPINES

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Abstract

Background: Nursing students are allowed to give medication with clinical supervision to enhance skills in medication administration. However, studies suggest that some students commit medication errors due to knowledge, personal, administrative and environmental factors.

Objective: This study will identify factors that cause student nurses to commit medication errors and correlate it to the number of perceived medication errors committed.

Methods: A correlational design was used to correlate the factors contributing to medication administration and the number of medication errors committed by the students. 388 randomly selected nursing students were asked to answer Modified Medication Error Questionnaire which measures the knowledge, administrative, personal and environmental factors which may contribute to medication administration errors. Medication administration errors are measured according to the number of times a student commits as perceived by them.

Results: Lack of knowledge of the drug and equipment to be used for administration, decrease in confidence, poor clinical assessment of patients' conditions, and poor follow ups from clinical instructor are identified concerns under knowledge factor. Poor positive feedback, inadequate supervision and belittling ways of clinical instructors are identified under the administrative factor. Fear of administering an injection or giving medications is a common problem under personal factor. Inappropriate labelling of medications, unfavorable room temperature, lack of space, inadequate lighting, disorganized medication administration schedule and noise are problems found under environmental factor. A minority of 17.3% claimed that they have encountered a medication error in any of their clinical duties.

Conclusion: Knowledge, administrative, personal and environmental factors have no effect towards medication errors. However, the relationship between age and the number of perceived medications errors is established. More in-depth investigation is recommended to determine the type of medication errors committed and its detrimental effects towards patient safety.

Keywords: medication errors; medication administration; nursing student; clinical instructor; patient safety

INTRODUCTION

In the health care profession, patient safety is a top most priority as it is an important indicator of quality health care. In 1999, a published article entitled “To Err is Human: Building a Safer Health System” surprised the world about the rising incidences of patient injuries...
brought about medical errors, one of which is medication errors (Donaldson, Corrigan, & Kohn, 2000). Health care personnel including student nurses must be prudent and conscientious in all aspects of care including medication administration where errors usually happen especially when hospital census is high.

According to the National Coordinating Council for Medication Error Reporting and Prevention, a medication error is any preventable event that may lead to inappropriate medication use or cause patient harm where the control is in the health care provider (National Coordinating Council for Medication Error Reporting and Prevention, 2006). In the Philippines, there are limited published articles about medication errors because unlike other countries, medication error incidences are not openly expose (Dumo, 2012; Hartigan-Go, 2007). In a study conducted by Ateneo de Manila University, Health Science Department, reporting system for medication errors are not strongly implemented so data available is not well-documented (Dumo, 2012). Despite of it, various factors are identified that may cause a student to commit medication errors. A retrospective study (Wolf, Hicks, & Seremus, 2006), inexperience and distractions were leading contributing factors which may be acceptable as a student but unacceptable to patient care. Errors committed were omission errors and giving the wrong dose of a drug. In another study (Koohestani & Bagcheghi, 2009), among 240 nursing students, 19.88% did not report their medication errors to their clinical instructors due to administrative barrier (mean=4.31) and fear (mean=4.24). An estimated 3% of student-made errors was noted in a study conducted by the United Stated Pharmacopeia which results to patient harm (Wolf et al., 2006). Such findings may have various implication not only to the nursing curriculum but to patient nursing care as well.

Medication errors unintentionally committed by nursing students has been a major concern among nursing schools and health care facilities in the Philippines. Nursing schools may have documented medication errors committed by students but have not been divulged for unknown reasons. Hence, this study is geared toward identifying contributing factors that may cause nursing students to commit medication errors.

METHODS

Study design
A descriptive quantitative design was used to describe the variable of the study. A correlational approach was also used to correlate the contributing factors to the perceived number of medication errors committed. 388 randomly selected third year and fourth year nursing students in all four nursing schools in Iligan City – 3 private schools and 1 public school. Letters for approval were sent to the college deans and letters of consent along with the questionnaire were given to the students. Confidentiality and privacy of the students’ information were assured.

Instrument
Questionnaire used is divided into three (3) sections. Section 1 is the demographic profile which consists of sex, year level, Nursing Care Management (NCM) subject currently enrolled and school currently enrolled. Section 2 is the Modified Medication Error Questionnaire adopted from the previous study (Koohestani & Bagcheghi, 2009). The questionnaire was not translated into local language but was evaluated for content validity by eight (8) nursing faculty, all of which are members of the College Research, Extension and Ethics Committee. It has twenty-four (24) statements categorized into Knowledge Factor, Administrative Factor, Personal Factor, and Environmental Factor, six (6) statements fall under each factor. Statements were answerable with strongly agree, agree, undecided, disagree and strongly disagree. Last section includes the perceived number of medication errors made by the respondents during their entire hospital exposure.
Data analysis
Respondent characteristics and contributing factors for medication errors were analyzed using mean and frequency distributions. The contributing factors to medication errors were determined using the Five-point Likert Scale; 1-strongly agree (I highly accept that the statement is true), 2-agree (I accept that the statement is true), 3-undecided (I am not sure whether to agree to disagree), 4-disagree (I do not accept the statement to be true in some cases), 5-strongly disagree (I do not accept the statement to be true at all). It was analyzed using mean scoring. Correlation between contributing factors to medication administration and perceived number of medication errors were analyzed using Chi-Square test.

RESULTS
Demographic profile of the respondents revealed that 71% were females and majority of the population are ages 19-21 years old. 50% of the respondents are level three (3) nursing students and the remaining 50% are level four (4) students. 74.8% came from private schools and only 25.3% came from a public school.

Table 1 Respondents’ Responses on Right Drug Administration in Terms of Knowledge Factor

<table>
<thead>
<tr>
<th>Knowledge Factor</th>
<th>SA Freq./%</th>
<th>A Freq./%</th>
<th>U Freq./%</th>
<th>D Freq./%</th>
<th>SD Freq./%</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have enough knowledge about drug information.</td>
<td>76/19.6 4%</td>
<td>203/52.0 4%</td>
<td>81/20.9 4%</td>
<td>24/6.2 4%</td>
<td>4/1.0 4%</td>
<td>2.17</td>
<td>D</td>
</tr>
<tr>
<td>I have enough skill in administering medications.</td>
<td>81/20.9 4%</td>
<td>217/56 4%</td>
<td>64/16.5 4%</td>
<td>24/6.2 4%</td>
<td>2/0.5 4%</td>
<td>2.10</td>
<td>D</td>
</tr>
<tr>
<td>I make enough assessment about the patient’s condition.</td>
<td>86/22.2 4%</td>
<td>223/57.5 4%</td>
<td>53/13.7 4%</td>
<td>22/5.7 4%</td>
<td>4/1.0 4%</td>
<td>2.06</td>
<td>D</td>
</tr>
<tr>
<td>I have enough knowledge on the use of different equipment in drug administration.</td>
<td>74/19.1 4%</td>
<td>194/50.0 4%</td>
<td>89/22.9 4%</td>
<td>27/7.0 4%</td>
<td>4/1.0 4%</td>
<td>2.21</td>
<td>D</td>
</tr>
<tr>
<td>I am provided with effective demonstrations and return demonstrations regarding drug administration.</td>
<td>157/40.5 4%</td>
<td>180/46.4 4%</td>
<td>26/6.7 4%</td>
<td>19/4.9 4%</td>
<td>6/1.5 4%</td>
<td>1.81</td>
<td>D</td>
</tr>
<tr>
<td>I am asked with questions by my Clinical Instructor regarding the medications before I am tasked to administer the medications.</td>
<td>242/62.4 4%</td>
<td>102/26.3 4%</td>
<td>19/4.9 4%</td>
<td>12/3.1 4%</td>
<td>13/3.4 4%</td>
<td>1.59</td>
<td>SD</td>
</tr>
</tbody>
</table>

Over-all mean 1.988 D

Table 1 reveals that nursing students lack knowledge of the drug and equipment to be used for administration, decrease in confidence level, poor clinical assessment of their assigned patients’ conditions, and poor follow ups from the clinical instructor prior to the administration of medications.

Table 2 shows that nursing students do not obtain positive feedback and enough supervision and belittling words from their clinical instructors. Though they do not feel any form of anxiety whenever the clinical instructor becomes too strict, they find staff nurses unapproachable.
### Table 2: Respondents’ Responses on Right Drug Administration in terms of Administrative Factor

<table>
<thead>
<tr>
<th>Administrative Factor</th>
<th>SA Freq. /%</th>
<th>A Freq. /%</th>
<th>U Freq. /%</th>
<th>D Freq. /%</th>
<th>SD Freq. /%</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am afraid of my Clinical Instructor.</td>
<td>40/10.3</td>
<td>102/26.3</td>
<td>118/30.4</td>
<td>84/21.6</td>
<td>44/11.3</td>
<td>2.97</td>
<td>U</td>
</tr>
<tr>
<td>I find the Staff Nurses approachable.</td>
<td>87/22.4</td>
<td>174/44.8</td>
<td>99/25.5</td>
<td>20/5.2</td>
<td>8/2.1</td>
<td>2.20</td>
<td>D</td>
</tr>
<tr>
<td>I receive positive feedback from my Clinical Instructor.</td>
<td>47/12.1</td>
<td>212/54.6</td>
<td>100/25.8</td>
<td>24/6.2</td>
<td>5/1.3</td>
<td>2.30</td>
<td>D</td>
</tr>
<tr>
<td>I get enough supervision from my Clinical Instructor.</td>
<td>182/46.9</td>
<td>159/41</td>
<td>30/7.7</td>
<td>7/1.8</td>
<td>10/2.6</td>
<td>1.72</td>
<td>SD</td>
</tr>
<tr>
<td>I am anxious whenever my Clinical Instructor becomes too strict.</td>
<td>130/33.5</td>
<td>143/36.9</td>
<td>63/16.2</td>
<td>29/7.5</td>
<td>23/5.9</td>
<td>2.15</td>
<td>D</td>
</tr>
<tr>
<td>I receive belittling words from my Clinical Instructor.</td>
<td>20/5.2</td>
<td>69/17.8</td>
<td>123/31.7</td>
<td>85/21.9</td>
<td>91/23.5</td>
<td>3.41</td>
<td>A</td>
</tr>
<tr>
<td><strong>Over-all mean</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>2.4588</strong></td>
<td><strong>D</strong></td>
</tr>
</tbody>
</table>

SD – Strongly Disagree; D – Disagree; U – Undecided; A – Agree; SA – Strongly Agree

<table>
<thead>
<tr>
<th>Personal Factor</th>
<th>SA Freq. /%</th>
<th>A Freq. /%</th>
<th>U Freq. /%</th>
<th>D Freq. /%</th>
<th>SD Freq. /%</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I get adequate sleep before going on duty.</td>
<td>39/10.1</td>
<td>82/21.1</td>
<td>87/22.4</td>
<td>98/25.3</td>
<td>82/21.2</td>
<td>3.26</td>
<td>U</td>
</tr>
<tr>
<td>I am bothered with a lot of personal problems.</td>
<td>70/24.5</td>
<td>95/27.3</td>
<td>90/23.2</td>
<td>118/30.4</td>
<td>58/14.9</td>
<td>3.22</td>
<td>U</td>
</tr>
<tr>
<td>I become too stressed in the duty shift.</td>
<td>62/16</td>
<td>119/30.7</td>
<td>106/27.3</td>
<td>106/18.8</td>
<td>73/7.2</td>
<td>2.71</td>
<td>U</td>
</tr>
<tr>
<td>I become anxious to the possibility of harming the patients.</td>
<td>67/17.3</td>
<td>142/36.6</td>
<td>90/23.2</td>
<td>90/15.2</td>
<td>59/7.7</td>
<td>2.60</td>
<td>D</td>
</tr>
<tr>
<td>I am afraid of holding the syringe/giving medications.</td>
<td>26/6.7</td>
<td>66/17.0</td>
<td>83/21.4</td>
<td>83/33.5</td>
<td>130/24</td>
<td>3.45</td>
<td>A</td>
</tr>
<tr>
<td>My hand trembles whenever I prepare/give medications.</td>
<td>24/6.2</td>
<td>81/20.9</td>
<td>86/22.2</td>
<td>86/29.6</td>
<td>82/21.1</td>
<td>3.39</td>
<td>U</td>
</tr>
<tr>
<td><strong>Over-all mean</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>3.1038</strong></td>
<td><strong>U</strong></td>
</tr>
</tbody>
</table>

SD – Strongly Disagree; D – Disagree; U – Undecided; A – Agree; SA – Strongly Agree

As reflected on Table 3, though anxiety is not a concern among nursing students, fear of holding syringes or giving medications is a common problem.
Table 4 Respondents’ Responses on Right Drug Administration in terms of the Environmental Factor

<table>
<thead>
<tr>
<th>Environmental Factor</th>
<th>SA Freq. /%</th>
<th>A Freq. /%</th>
<th>U Freq. /%</th>
<th>D Freq. /%</th>
<th>SD Freq. /%</th>
<th>Mean</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is appropriate labeling of the drug (name, dose, route, frequency).</td>
<td>184/47.4</td>
<td>141/36.3</td>
<td>38/9.8</td>
<td>14/3.6</td>
<td>11/2.8</td>
<td>1.78</td>
<td>D</td>
</tr>
<tr>
<td>The room temperature in the nurses’ station is conducive for preparing medications.</td>
<td>132/34</td>
<td>158/40.7</td>
<td>64/16.5</td>
<td>24/6.2</td>
<td>10/2.6</td>
<td>2.03</td>
<td>D</td>
</tr>
<tr>
<td>There is ample space in preparing medications in the nurses’ station.</td>
<td>111/28.6</td>
<td>155/39.9</td>
<td>76/19.6</td>
<td>35/9</td>
<td>11/2.8</td>
<td>2.18</td>
<td>D</td>
</tr>
<tr>
<td>There is adequate lighting in the nurses’ station for preparing the medications.</td>
<td>145/37.4</td>
<td>165/42.5</td>
<td>41/10.6</td>
<td>26/6.7</td>
<td>11/2.8</td>
<td>1.95</td>
<td>D</td>
</tr>
<tr>
<td>There is an organized schedule for the giving of medications.</td>
<td>184/47.4</td>
<td>155/39.9</td>
<td>29/7.5</td>
<td>15/3.9</td>
<td>5/1.3</td>
<td>1.72</td>
<td>SD</td>
</tr>
<tr>
<td>The noise in the nurses’ station distracts me whenever I prepare the medications.</td>
<td>29/7.5</td>
<td>94/24.2</td>
<td>113/29.1</td>
<td>94/24.2</td>
<td>58/14.9</td>
<td>3.15</td>
<td>U</td>
</tr>
</tbody>
</table>

Over-all mean 2.1332 D

SD – Strongly Disagree 1.80 SD
D – Disagree 1.81–2.60 D
U – Undecided 2.61–3.40 U
A – Agree 3.41–4.20 A
SA – Strongly Agree 4.21–5.0 SA

Table 4 presents shows that problems under environmental factor are inappropriate labelling of medications, unfavorable room temperature, lack of space, inadequate lighting, disorganized medication administration schedule and noise. Though majority of nursing students were not able to commit medication errors, 17.3% claimed that they have committed at least one (1) to four (4) medication errors during their clinical exposures (See Table 5).

Table 5 Number of Medication Errors Perceived by Student Nurses

<table>
<thead>
<tr>
<th>Number of Medication Errors Perceived</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>321</td>
<td>82.7</td>
</tr>
<tr>
<td>1</td>
<td>40</td>
<td>10.30</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>3.90</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>2.60</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>.30</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>.30</td>
</tr>
<tr>
<td>Total</td>
<td>388</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 6 Relationship between Contributing Factors on Medication Errors to Perceived Number of Medication Errors

<table>
<thead>
<tr>
<th>Factors on Drug Administration</th>
<th>Chi-Square values/Likelihood Ratio</th>
<th>Probability values</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge factor</td>
<td>13.44</td>
<td>.858</td>
<td>Not significant at .05 level</td>
</tr>
<tr>
<td>Administrative Factor</td>
<td>16.321</td>
<td>.696</td>
<td>Not significant at .05 level</td>
</tr>
<tr>
<td>Personal Factor</td>
<td>24.752</td>
<td>.211</td>
<td>Not significant at .05 level</td>
</tr>
<tr>
<td>Environmental Factor</td>
<td>16.603</td>
<td>.679</td>
<td>Not significant at .05 level</td>
</tr>
</tbody>
</table>

Using Chi-square test, all factors categorized as knowledge, administrative, personal and environmental factors are found not significant towards the perceived number of medication errors committed by nursing students (See Table 6). Table 7 shows that only age has been found to be significant to the perceived number of medication errors.

Table 7 Relationship between the Demographic Profile to the Perceived Number of Medication Errors

<table>
<thead>
<tr>
<th>Demographic Profile</th>
<th>Chi-Square Values (CS)/Likelihood Ratio</th>
<th>Probability values</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>6.434</td>
<td>.266</td>
<td>Not significant at .05 level</td>
</tr>
<tr>
<td>Age</td>
<td>21.186</td>
<td>.048</td>
<td>Significant at .05 level</td>
</tr>
<tr>
<td>NCM Subjects Enrolled</td>
<td>24.752</td>
<td>.211</td>
<td>Not significant at .05 level</td>
</tr>
<tr>
<td>School Currently Enrolled</td>
<td>23.878</td>
<td>.067</td>
<td>Not significant at .05 level</td>
</tr>
<tr>
<td>Year Level</td>
<td>10.378</td>
<td>.065</td>
<td>Not significant at .05 level</td>
</tr>
</tbody>
</table>

DISCUSSION

Medication administration is a skill where nurses including nursing students must have mastery. The study identified four factors that may contribute to medication errors. Under the knowledge factor, problems encountered are lack knowledge of the drug and equipment to be used for administration, decrease in confidence level, poor clinical assessment of patients’ conditions, and poor follow ups from clinical instructors prior to administration. These problems are considerable since they are still learning and developing that is why students must be followed up by a clinical instructor pursuant to Commission on Higher Education (CHED) Memorandum Order No. 14 Series of 2016. Prior to clinical exposure, students have been expected to have studied the medications and memorize all the Rights to Drug Administration (Berman & Snyder, 2012) to avoid committing medication errors. Medication errors usually committed due to knowledge deficit are omission, wrong dose, and extra dose (Wolf et al., 2006). This indicates that knowledge of medication administration is important to achieve mastery of the skill.

As for the administrative factor, poor positive feedback, inadequate supervision and belittling ways of clinical instructors have been identified. Positive feedback and adequate supervision are all necessary to enhance the skill (Clark, 2008; Corbett & Bent, 2005). Demeaning and belittling ways may have negative impact to them because some students will perceive them as an insult or put-down (Hutchinson & Jackson, 2013), making them powerless, helpless, traumatized and upset (Clark, 2008). Such actions may instill fear and intimidation in them which hinders their learning (LaFauci, 2009). Despite of such actions, students maintain civility towards their clinical instructors (Clark, 2008). The unapproachability of staff nurses is also crucial to the mastery of the skill. Stress experienced by staff nurses is an identified factor which makes them unapproachable (Burrows, 1997). This signifies that positive feedback, adequate
supervision, and constructive mentoring may enhance the skill of medication administration.

Anxiety is not a major concern among nursing students but fear of holding syringes or giving medications is a common problem. Fear of administering an injection is associated with lack of practice and mastery (Deglin & Vallerand, 2006). Previous study stressed out that the needle is a source of fear to some individuals that provokes a frightening reaction (Emmanuelson, 1997). Moreover, student performance can also be a source of fear since errors are strictly discouraged in an actual clinical setting (Durham & Alden, 2008). This implies that fear may affect the performance of the student as to medication administration is concern.

Inappropriate labeling of medications, unfavorable room temperature, lack of space, inadequate lighting, disorganized medication administration schedule and noise are among the concerns under environmental factor. Such problems may cause distractions and interruption during medication preparation (Alanko & Nyholm, 2007; Mazer, 2005). Study (Greenberg, 2000) suggests that nurse stations have to do with easy access and improved traffic flow so clinically related functions such as medication preparation may be performed correctly. Though exposure to such environment may be advantageous to staff nurses, it is found disadvantageous to nursing students due to inexperience and knowledge deficit (Durham & Alden, 2008). Therefore, the performance of the student may be dependent to the type of environment he or she is exposed to.

17.3% of the nursing students claimed that they have done a medication error in any of their clinical duties. Unintentionally made, such errors have an impact to patient safety (Hartigan-Go, 2007). Medication errors were reportedly a cause of morbidity and mortality (Donaldson et al., 2000). Wrong technique, omission, wrong drug, wrong prescription, wrong amount and wrong administration route are among the identified medication errors in the Philippines (Dumo, 2012). Therefore, regardless of the gravity of the medication error, it is still very important to take note the smaller percentage of errors committed.

Insignificant relationship between the knowledge, administrative, personal and environmental factors and the number of perceived medical errors may be crucial to the performance of a nursing student. Though knowledge deficit (Table 1), belittling ways of clinical instructors (Table 2), fear of holding syringes and giving medications (Table 3) and an unfavorable working environment (Table 4) are present, these has no effect to the perceived number of medication errors since majority of the students did not commit such errors. This implies that student nurses may have been trained not just to adjust to poor working environments since most hospitals in the Philippines do not have a perfect learning environment for medication administration, but also endure the hardships and challenges of a beginner nurse.

Age has been found to significantly affect the perceived number of medication errors. According to policies, standards and guidelines formulated for the Bachelor of Nursing Curriculum (CHED Memo Order Series of 2016), competencies are more advanced in the higher levels and students are assigned to more than one patient which may be challenging to the student. Mastery is expected at this level and confidence are strongly encouraged to promote independence in the performance of nursing care. Studies also suggest that there is a direct relationship between higher education and medication errors. It is expected that as the level of knowledge among nursing students goes higher, medication errors may be controlled (Charkhat-GorgichEnaam-Al-Hagh, Maryam, H., Ali, & Masoud, 2014). An irony of this matter has also been identified by (Green, 2004), where he found out that medical errors are prominent among the most experienced compared to the less experienced. One common type of error is during the post medication administration where the error cannot be identified for some reasons (Green, 2004). This signifies that as a nursing student
is exposed to a higher level of learning, the higher is the risk of committing medication errors.

CONCLUSION

Knowledge deficit, belittling ways of clinical instructors, fear of holding syringes and giving medication, and an unfavorable working environment are among the identified contributing factors to medication errors. These concerns however are not significant to the number of perceived medication errors committed. However, age is found to be a factor why nursing students commit such errors. An in-depth investigation is recommended to determine the type of medication errors committed by nursing students and its effects towards patient safety.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors equally contributed in this study.

References

A VARIETY OF TEACHING-LEARNING STRATEGIES TO IMPROVE THE CARING BEHAVIOR OF NURSING STUDENTS

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Abstract
Background: Caring is the essence of nursing that is believed vital in improving the health and well-being of patients and in facilitating health promotion. Nursing education has a fundamental role in shaping a positive student’s caring behavior.
Objective: This study identified the caring behavior of the final-year nursing students after completing a critical care nursing course unit by implementing assorted teaching learning strategies.
Methods: This study was a descriptive research using a comparative design. Samples were recruited from a group of 152 final-year students using a random sampling technique (n=76). Data were collected using a valid and reliable Indonesian caring instrument consisting of 32 items based on Watson’s ten carative factors. Data were analyzed using descriptive statistics by calculating mean scores of students’ caring behavior. A paired t test was performed to evaluate the difference between caring behavior before and after completion of the course unit involving a diverse teaching learning strategy, such as face-to-face lectures in the class, quizzes and practicums, facilitated small group case-based discussions, and expert reviews.
Results: Results showed that more than half of the students had negative caring behavior before (59.22%) and after (54.55%) participating in learning process. There was also a barely statistical insignificance in the change of caring behavior following the course unit that involved various learning strategies (p value = 0.276). Further analyses of the 10 carative factors revealed that there was a significant change in transpersonal teaching-learning, provision for a supportive, protective, and/or corrective mental, physical, sociocultural, and spiritual environment, and spiritual environment and existential-phenomenological spiritual forces (improved, p value <0.05).
Conclusions: Student-centered learning is a good approach to enhance the students’ critical thinking skills. However, in implementing the approach, there is a need to reevaluate appropriate method so as to simultaneously develop students’ critical thinking skills, caring behavior, and empathy.

Keywords: caring behavior; teaching-learning strategies; nursing students

INTRODUCTION

Caring is the core or the soul of nursing; and it is expected that all nurses value the essence of caring and always perform caring behavior throughout their lifetime, especially when providing nursing care to the patients to facilitate the healing process (Brilowski & Cecilia Wendler, 2005). Caring behavior should be cultivated since nursing students undertaking their basic education. A study in Iran suggested exploring students’ caring
behavior related to acquired curriculum and learning strategies (Nouri, Ebadi, Alhani, & Rejeh, 2014).

The final-year (enrolled in 2011) undergraduate students of Faculty of Nursing Universitas Padjadjaran were received their training program according to the (2010) AINEC (Association of Indonesian Nursing Education Institutions) curriculum that claimed to adopt a student-centered learning model. Starting from the second semester, most of the course units were offered in a block system that lasted within 3-4 weeks for each block (course unit/subject), involving various learning strategies such as mini-lectures, tutorials (mainly applying the seven-jump in problem-based learning (PBL)), and laboratory practices. Students reported that they were overwhelmed and had difficulties in remembering and understanding given materials. Correspondingly, lecturers reported that the majority of the students were lack of cognitive retention as the course progressed in each semester. Moreover, with respect to the students’ clinical placement, more than 60% of the preceptors in the hospital reported that most of the students showed poor communication skills with their preceptors and nursing staffs. It was also reported that during their clinical rotations, the students tended to show disfavored ethics, discipline, empathy, and teamwork (Labrague, 2012). This situation is upheld by previous study that identified caring attitudes of first-year, second-year, and third-year undergraduate students at Faculty of Nursing Universitas Padjadjaran (n=82). The study found that there were no significant differences in caring attitudes among the students (p value >0.05) despite the expectation that caring attitude should gradually be more developed and enhanced as the students advancing through their academic training (Susilaningsih, Agustina, Komariah, & Somantri, 2013).

The student-centered learning model is beneficial in optimizing different potentials of each student through various learning strategies, such as self-directed learning, concept mapping, problem-based learning and case-based learning. These learning strategies aim to encourage students to think critically and to be able to solve problems. In addition to learning strategies, the role of tutor or facilitator is also very important. Specifically, in the implementation of problem-based learning, tutors play a very small role in directing students (Russell, Comello, & Wright, 2007). It is mainly believed that there is no learning strategy that is better than the other or fits for all students; and therefore, various learning strategies are usually applied to support the development of students’ cognitive, psychomotor, and behavioral skills (Russell et al., 2007). Pertaining to the formation of nursing students’ caring behavior, diverse learning strategies can be utilized in strengthening the 10 carative factors of student caring behavior.

This research aimed to identify the difference of nursing students’ caring behavior before and after completion of a Critical Care Nursing (Advanced Nursing) course unit that involved various learning strategies. This course unit is an advanced subject offered in the fourth year of undergraduate nursing course at Faculty of Nursing Universitas Padjadjaran. It weighs 4 credits and was allocated for 5 hours every week during a semester.

METHODS

Study design
This study was a descriptive research with a cross-sectional approach which compared nursing students’ caring behavior before and after completing a critical nursing course unit for one semester. A simple random sampling technique was used to recruit samples from 152 final-year students, and by being drawn we obtained 76 respondents (n =76; 95% CI; p = 0.05). Learning strategies applied were varied, including: (1) lectures and discussions; (2) tutored small group discussions to discuss different fictitious cases related to lecture materials; (3) case presentations; (4) independent study assignments, for example reading some
materials from textbooks or journal articles; (5) quizzes (to evaluate independent study assignments); (6) laboratory practices, involving pre-lab activities (reading or watching videos related to specific procedures) and supervised by tutors. Assessments for this course unit were done using CBTs (Computer-Based Tests) that largely comprised of case analyses. Procedural skills evaluations (CPR—Cardiopulmonary resuscitation and initial assessment) were also performed.

**Instruments**

To measure student’s caring behavior, an Indonesian caring questionnaire adopted from previous study (Susilaningsih et al., 2013) was used. The questionnaire was developed from Watson’s caring theory (Watson, 1985), and was tested on nursing students with validity test result of 0.349 and reliability test 0.94. This questionnaire consists of 32 statements requiring responses in accordance with a-four response Likert scale, ranging from strongly agree to strongly disagree. Students were asked to fill in the questionnaire after a learning contract was agreed at the beginning of the course unit and after completion of the unit.

**Data analysis**

Descriptive statistics by calculating mean scores and percentage were used to describe students’ caring behavior. The paired t tests were performed to analyze caring behavior and its carative factors before and after completing the Critical Care Nursing course unit.

**Ethical consideration**

Ethical clearance was submitted to the research unit of the Faculty of Nursing Universitas Padjadjaran and the submission of a research permit addressed to the Dean of the Faculty of Nursing Universitas Padjadjaran to obtain a research permit and information publication. Informed consent in writing is filled after the lecture contract is approved by all students, and the identity will be kept confidential. Respondents have the right to participate or decide not to participate in the middle of the ongoing research process.

**RESULTS**

This study was conducted in July – August 2016. Participants were 76 final-year nursing students aged 22-23 years old, mostly females and only 9 males. The results of this study are presented in the tables below.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Students’ caring behavior before and after completing critical care nursing course unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students’ caring behavior</td>
<td>Positive</td>
</tr>
<tr>
<td>Before</td>
<td>31</td>
</tr>
<tr>
<td>After</td>
<td>35</td>
</tr>
</tbody>
</table>

It can be inferred from Table 1 that more than half of the students had negative caring behavior prior to and following the course unit. Table 1 also indicates that the proportion of students with negative caring behavior decreased around 5% after completion of the unit.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Students’ caring behavior average score before and after completing a critical care nursing course unit (n=76)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caring behavior</td>
<td>Mean</td>
</tr>
<tr>
<td>Pre-test</td>
<td>101.7</td>
</tr>
<tr>
<td>Post-test</td>
<td>103.1</td>
</tr>
</tbody>
</table>
Table 3 Difference between students’ caring behavior before and after completing a critical care nursing course unit (n=76)

<table>
<thead>
<tr>
<th>Caring behavior</th>
<th>Mean</th>
<th>Std.Deviation</th>
<th>95% Confidence interval</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differences pre-post test</td>
<td>-1.407</td>
<td>11.17</td>
<td>-3.96</td>
<td>1.14</td>
</tr>
</tbody>
</table>

Table 2 and 3 displays a bivariate analysis result utilizing a paired t test to examine the difference of students’ caring behavior before and after participating a critical care nursing course unit. At table 2 it can be seen that the mean value of caring for students is higher in the post-test, but based on the table 3, it can be seen that the average pre-test and post-test values are negative (-1.407), this indicates that there is an increase in the post-test value. However, this post-test score increase has not been significant, this is shown by p value of more than 0.05.

Table 4 Difference between students’ caring behavior based on carative factors before and after completing a critical care nursing course unit (n=76)

<table>
<thead>
<tr>
<th>Carative Factors</th>
<th>Mean</th>
<th>Std.Deviation</th>
<th>95% Confidence interval of the Difference</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanistic altruistic system of value</td>
<td>-0.21</td>
<td>2.33</td>
<td>-0.74391</td>
<td>0.32286</td>
</tr>
<tr>
<td>Faith and hope</td>
<td>-0.16</td>
<td>1.59</td>
<td>-0.52170</td>
<td>0.02059</td>
</tr>
<tr>
<td>Sensitivity to self and others</td>
<td>0.01</td>
<td>1.81</td>
<td>-0.39984</td>
<td>0.42615</td>
</tr>
<tr>
<td>Helping-trusting relationship</td>
<td>0.13</td>
<td>2.56</td>
<td>-0.45291</td>
<td>0.71607</td>
</tr>
<tr>
<td>Expressing positive and negative feelings</td>
<td>0.04</td>
<td>1.53</td>
<td>-0.31145</td>
<td>0.39040</td>
</tr>
<tr>
<td>Creative problem solving</td>
<td>-0.03</td>
<td>1.22</td>
<td>-0.30549</td>
<td>0.25286</td>
</tr>
<tr>
<td>Transpersonal teaching-learning</td>
<td>-6.353</td>
<td>1.28</td>
<td>-6.64865</td>
<td>-6.06188</td>
</tr>
<tr>
<td>Supporting, protective, and/or correct</td>
<td>-0.54</td>
<td>1.95</td>
<td>-0.98483</td>
<td>-0.09412</td>
</tr>
<tr>
<td>Human need assistant</td>
<td>-0.16</td>
<td>1.69</td>
<td>-0.54398</td>
<td>0.22819</td>
</tr>
<tr>
<td>Existential-phenomenological spiritual forces</td>
<td>6.84</td>
<td>1.13</td>
<td>6.58343</td>
<td>7.10078</td>
</tr>
</tbody>
</table>

Table 4 reveals that there were significant changes in students’ caring behavior within three carative factors, namely the transpersonal teaching-learning, provision of supportive, protective, and/or corrective mental, physical, sociocultural, and spiritual environment, and existential-phenomenological spiritual forces (p value <0.05). Interestingly, within the helping-trusting relationship factor, there was a decline in the students’ mean score, it can be seen that the mean score is positive 0.13. Contrariwise, the transpersonal teaching-learning increase quite sharply which the score is negative (-6.353) and this rise is very significant (p value 0.000).

**DISCUSSION**

Results of this study showed that more than half of the students exhibited negative caring behavior before and after the learning process. Although there was a decrease in the proportion of students with negative caring behavior, a further analysis indicated that after receiving various learning strategies during a
semester of critical care nursing course unit, there was no significant change in students’ caring behavior. It is even more intriguing that students demonstrated a declined score within human care (helping-trusting) relationship component of the 10 carative factors. However, although in general, caring behavior students have no statistically significant changes, but there are 3 domains of the 10 carative factors that change significantly, namely the transpersonal teaching-learning, provision of supportive, protective, and/or corrective mental, physical, sociocultural, and spiritual environment, and existential-phenomenological spiritual forces. These findings could be attributable to the implementation of the student-centered learning approach involving various learning strategies that are intended to encourage students to think critically and to be able to solve problems. Nevertheless, in PBL tutors engaged minimally in directing students (Russell et al., 2007); and thus might inhibit the development of the human care relationship.

It is also stated that in relation to caring, nurses cannot work alone, they need work with others in order for the interaction of caring (Favero, Pagliuca, & Lacerda, 2013; Watson, 2008). Transpersonal teaching learning is inter-subjectivity of the human to human relationship which each person is influenced by another person. There is a moral commitment to each other, so they use of the self: self-knowledge, self-growth, self-control, self-recuperation and self-recovery. To develop this relationship, a caring moment is requisite, where a human-to-human transaction occurs (Watson, 2008). Study affirms that caring is an interpersonal process depicted through intimate relationships and interpersonal sensitivity (Finfgeld-Connett, 2006). Encountering therapeutic relationships where the students are valued as human is important (Costello & Haggart, 2008). Accordingly, regardless of a variety of learning strategies applied in the learning process; tutors play an essential role in shaping students’ caring behavior. As stated by previous study (Benner, 2001), caring cannot be compelled, instead it should be comprehended and facilitated in practice. In addition, students’ experience related to classroom or clinical learning activities along with adequate support from peers, faculty, and healthcare professionals in the field; can contribute to students’ caring development (Berman & Snyder, 2015). Further investigation on the role of tutors or facilitators in developing students’ human care relationship is needed.

In contrast, in terms of provision for a supportive, protective, and/or corrective mental, physical, sociocultural, and spiritual environment; results indicated that students’ behavior was significantly improved after completion of the learning process. Watson expresses that this carative factor is strongly related to the intention of “doing” for another and “being” with another who is in need by utilizing particular skills and comportment (Watson, 2008). This finding may well represent that to some extent, the learning activities allowed the students to learn how to promote and create a holistic healing environment and anticipate others’ needs. For instance, students received immediate and direct feedback after completing each quiz (individual) and laboratory practice (group); in this way, they realized their strengths and weaknesses as well as the “rights” and “wrongs”. Moreover, the students’ improvement of this carative value could stem from small group discussion activities. By engaging to the discussion process, students had the opportunity to develop numerous interpersonal skills, such as listening to others when they were talking and maintaining a comfort environment during discussions (cleanliness, noise, safety, etc.). Once more, tutors play a vital function in supporting students develop this carative factor. This situation is relevant with an article by Costello and Haggart explaining that as role models, teachers nurture relationship with their students, interpret difficult concepts and help students to apply concepts into practice (Costello & Haggart, 2008). Therefore, both teachers and students create a learning (helping) environment to mutually work
towards students’ personal and professional growth. Furthermore, the learning contract was given at the first time of learning; it is a written mutual agreement between lecturer and students and states explicitly what a learner will do to achieve specific learning outcomes. Russel et.al considered that learning contract is one of some form of self-directed learning that encourages student to active learning. Student will take an increased responsibility for their own learning with use of learning contract (Russell et al., 2007). Unfortunately, contemporary nursing education with rigidly designed learning modules and large numbers of students constrain the exploration of students’ learning experiences through reflective practices; and may further stall the development of their caring culture (Russell et al., 2007).

Additionally, a qualitative study regarding facilitating factors of role-modeling process in Iran involving nursing students (bachelor, master, and doctoral) and instructors from five nursing colleges in 2011, discussed the importance of teachers’ ability to manage various effort for student's humanistic (emotional, spiritual, and intellectual) and professional growth. In addition, model teachers are considered to have special abilities such as excellence in scientific and professional quality; long-term experience in teaching, research, and clinical; respectable family background; being creative and innovative; and being charismatic. Other identified facilitating factors including student's effort and motivation; strategies governing the education system; and appropriate equipment and facilities (Nouri et al., 2014). Overall, to establish a suitable environment for enhancement of students’ caring behavior, learning strategies should be implemented in conjunction with sufficient role-modeling process.

CONCLUSION

Results of this study indicated that prior to and following a learning program of critical nursing subject utilizing various learning strategies, more than half of the students’ demonstrated negative caring behavior. There was also no significant difference in students’ caring behavior before and after completion of the learning program. However, according to the 10 carative factors, the transpersonal teaching-learning factor, provision of supportive, protective, and/or corrective mental, physical, sociocultural, and spiritual environment, and existential-phenomenological spiritual forces significantly improved. It can be concluded that the effectiveness of a variety of learning strategies in improving nursing students’ caring behavior could greatly be affected by the role performance of tutors/facilitators or lecturers. Hence, the tutors may need a quality enhancement program (scientific meeting, training of trainer [ToT], and regular performance evaluation). It is recommended incorporating a holistic humanistic approach in implementing learning strategies throughout the course of undergraduate study to enable students strengthen their caring behavior.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors equally contributed in this study.

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STIGMA TOWARDS PEOPLE LIVING WITH HIV/AIDS AMONG COUNSELING OFFICERS IN SOUTH SULAWESI, INDONESIA

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Abstract
Background: Human Immunodeficiency Virus (HIV) / Acquired Immunodeficiency Syndrome (AIDS) has become a global problem nowadays. To reduce its spread, Voluntary Counseling and Testing (VCT) and Provider-Initiated Testing and Counseling (PITC) have been provided. However, these interventions remain ineffective to discover new cases, as the stigma among health officers may exist.

Objective: To compare the stigma towards people living with HIV/AIDS between VCT and PITC officers.

Methods: This was a descriptive comparative study conducted in Makassar City, Parepare City and Sidenreng Rappang Regency, South Sulawesi Province, Indonesia. There were 139 samples were selected using a convenience sampling technique, which consisted of 66 VCT counseling officers and 73 PITC officers. The questionnaire from Health Policy Project in Thailand was used to measure the HIV/AIDS related-stigma. Data were analyzed using descriptive statistics and Mann Whitney test.

Results: Findings showed that there was a statistically significant difference in stigma between the group of VCT and PITC on people living with HIV/AIDS (PLWHA), which the mean of stigma in the PITC group (73.07) was higher than the mean value in the VCT group (66.61).

Conclusion: There was a significant difference in stigma between VCT and PITC officers towards PLWHA. It is suggested that PITC curriculum should be evaluated, and supervision and monitoring in both VCT and PITC groups should be implemented regularly to reduce the stigma towards PLWHA.

Keywords: Stigma; HIV/AIDS; VCT; PITC

INTRODUCTION

Currently the Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) has spread across the world. In 2016 the World Health Organization (WHO) estimated that people living with HIV/AIDS (PLWHA) had been at the number of 36.7 million people, in both adults and children (UNAIDS, 2017). The African continent is the first rank with the highest case of 25.6 million (UNAIDS, 2017; WHO, 2016). UNAIDS reports that, in the continent of Asia and the Pacific, Indonesia has been ranked third after India and China (UNAIDS, 2017). AIDS cases in Indonesia in 2016 were at 86,780 people
while HIV infections in South Sulawesi Province were 993 people with a cumulative number of 6,296 people (MOH, 2017).

The discovery of HIV/AIDS coverage in Indonesia until December 2016 has increased with a cumulative number of 232,323 people. This is still far from the estimated target for 2016 which should reach 785,621 people (MOH, 2014a, 2017). This is certainly very worrying because the discovery of HIV/AIDS cases has not been optimal in health services as expected. HIV transmission will certainly continue to occur with the pattern of HIV/AIDS transmission which has shifted from initially focused on risky populations including women sex workers, transvestites, injecting drug users to housewives and men who have sex with other men, so the pattern of the spread of HIV/AIDS is now in the general public and no longer centered on the at-risk population, especially for housewives and there will be transmission from mother to child/baby (MOH, 2014c; Risal & Gunawan, 2018).

A study (Wagner, Girard, McShane, Margolese, & Hart, 2017) explained that one of the obstacles to the low coverage of people who would like to test and know their HIV status is that there are concerns of the stigma and discrimination from health workers so that it affects the access of PLWHA to health services. Another study (Kumar et al., 2017) explained that HIV-related stigma and discrimination are factors that drive this epidemic, despite advances in medical care and increased patient awareness of this disease. It is also explained that there is an increasing stigma as an obstacle to access in the HIV treatment series (Nyblade et al., 2017).

Stigma is a negative presumption in a group including PLWHA (Wagner, Hart, McShane, Margolese, & Girard, 2014). The stigma of PLWHA is reflected in cynicism, feelings of excessive fear and negative perceptions (Paryati, Raksanagara, & Afriandi, 2012). PLWHA reported negative experiences they received by health workers related to interaction or communication, irrelevant questions, harsh treatment, sympathy or pity, excessive precautionary measures through the use of different personal protective equipment for each patient, refusal of treatment, non-referral health needed, delays in hospital care, inadequate psychosocial support and violations of the confidentiality of patients’ HIV status (Arrey, Bilsen, Lacor & Deschepper, 2017).

Stigma and discrimination are the main factors that influence the ability of nurses to treat PLWHA patients. Nurses are well aware of the stigma and discrimination caused by HIV/AIDS so as to make adjustments in providing nursing care to reduce the manifestation of AIDS stigma. However, although it is stated that PLWHA are treated equally by applying the use of universal prevention consistently (Mill et al., 2013), many health workers are still afraid of dealing with PLWHA as one of the factors related to stigma and discrimination (Wodajo, Thupayagale-Tshweneagae, & Akpor, 2017). A previous study (Paryati et al., 2012) explained that the occurrence of stigma and discrimination to PLWHA by health workers is influenced by several things including knowledge about HIV/AIDS, perceptions of PLWHA, level of education, length of work, age, training, gender, institutional support and adherence to religion. If the stigma and discrimination among health workers is not reduced, the patients will not have the desire, fear, or delay to check HIV status.

Global HIV/AIDS control refers to three things known as three zero, namely reducing the number of new HIV cases as low as possible, reducing AIDS mortality and reducing the level of stigma and discrimination (MOH, 2014a, 2015). One of the programs implemented by the Ministry of Health of Indonesia based on WHO recommendations to increase the scope of HIV counseling is through counseling and testing conducted by health workers / personnel trained to handle HIV/AIDS patients through both Voluntary Counseling and Testing (VCT) and Provider-Initiated Testing and Counseling (PITC) (MOH, 2014a, 2014b; WHO, 2009).
HIV/AIDS between VCT and PITC officers.

This was a descriptive comparative study to explore the stigma and discrimination between the two officer groups. Study D

METHODS

Setting
This research was conducted in Makassar City, Parepare City and Sidenreng Rappang Regency, South Sulawesi Province Indonesia.

Sample
There were 139 samples were selected using a convenience sampling technique, which consisted of 66 VCT counseling officers and 73 PITC officers. The inclusion criteria in this study were health workers (doctors, nurses or midwives) who had VCT and PITC training, being a part of continuous comprehensive services, and willing to be a respondent. Exclusion criteria were health workers who had been trained in VCT and PITC but were not active in their implementation for at least one year, the officers who were not from the health profession, for example (NGOs), and the officers who were not presented at the time of the study.

Instrument
Data were collected using a questionnaire to measure HIV-related stigma among health staff adopted from the Health Policy Project in Thailand (Health Policy Project, 2013) based on the recommendation of UNAIDS and WHO. Validity and reliability tests have been carried out with the results of Cronbach’s alpha value of 0.707. The questionnaire has been translated into Indonesian language. This questionnaire is to measure stigma and discrimination. Based on the operational definition, stigma is negative connotation or labeling which can cause discrimination against PLWHA. The process that produces a stigma includes the actual stigma if there is a person or community that takes concrete actions both verbal and non-verbal causing others to be distinguished and excluded, and the potential or perceived stigma if the stigma does not occur yet, but there is a sign or feeling of discomfort so that people tend not to access health services. Internal stigma or self-stigmatization is that someone judges himself as “not entitled” and “disliked by society” (MOH, 2012). The scale used is numerical with objective criteria using the median value. A good value if it is less or equal to the

VCT and PITC Counseling Officers towards people living with HIV/AIDS as well as to compare the perception related stigma and discrimination between the two officer groups.

However, as there is a lack of information about stigma and discrimination among health care officers, therefore this study aims to explore the stigma and discrimination between VCT and PITC Counseling Officers towards people living with HIV/AIDS as well as to compare the perception related stigma and discrimination between the two officer groups.

Methods

Study Design
This was a descriptive comparative study to compare the stigma towards people living with HIV/AIDS between VCT and PITC officers.

program was initially implemented in Makassar City and Parepare since 2005 for VCT and 2010 for PITC and expanded its implementation after the rule of law through the Health Minister Regulation of the Republic of Indonesia in 2013.

VCT is the main model of HIV testing services at the patient’s initiative to seek HIV screening services performed before the test, after the test, and during HIV treatment by a trained counselor (MOH, 2013; WHO, 2009). VCT counseling aims to prevent HIV transmission through assessing risk factors, reducing risk factors, changing risk behavior, improving the quality of life of patients and further counseling for PLWHA (MOH, 2014a). PITC is a counseling approach that aims to discover HIV diagnosis, early treatment and comprehensive care for PLWHA (Kennedy et al., 2013; Roura, Watson-Jones, Kahawita, Ferguson, & Ross, 2013; Topp et al., 2012).

However, as there is a lack of information about stigma and discrimination among health care officers, therefore this study aims to explore the stigma and discrimination between VCT and PITC Counseling Officers towards people living with HIV/AIDS as well as to compare the perception related stigma and discrimination between the two officer groups.
median value. The highest score is 14 and the lowest score is 1.

**Ethical Consideration**
This research has been approved by the Research Ethics Committee of Faculty of Medicine of Hasanuddin University with number approval 427/ H4.8.5.31/PP36-Kometik/2018. The study permission was also obtained from Regional Development Planning Board in Makassar City, Parepare City and Sidenreng Rappang Regency, South Sulawesi Province as well as from the Community Health Centers for data collection. Before the research was conducted, the researchers explained the purpose of the research and asked for approval from the respondents by signing an informed consent.

**Data Collection**
Data were collected by the researchers assisted by three research assistants with a minimum education of Bachelor degree in nursing and also worked as a counselor in the study settings. Prior to data collection, the research assistants were trained about objective and procedures of data collection. Data collection used single blind, which the researchers did not know the respondents’ data to get accurate information and prevent answers that were not in accordance with the respondents’ condition. This is because the researchers were the facilitators of VCT and PITC counseling training.

**Data Analysis**
Data were analyzed using univariate (frequency distribution) and bivariate (Mann Whitney test) analysis. Mann Whitney test was used to examine the difference in mean rank (ordinal data) from two different independent groups and if the data distribution is not normal (Dharma, 2011).

**RESULTS**
Table 1 shows that the majority of respondents was female (119%) and married (88.5%). Most of the respondents were nurses (38.8%) and midwives (33%), followed by physicians (15.1%). Majority of respondents had bachelor degree in nursing and Ners profession (33.8%) and Diploma III. Bachelor degree and Master degree in this study refer to the degree in all majors. It also shows that PITC group have joined the training about stigma and discrimination (63%) more than VCT group (45.5%).

<table>
<thead>
<tr>
<th>Characteristics of respondents</th>
<th>VCT</th>
<th>PITC</th>
<th>Total</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
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<tr>
<td>Male</td>
<td>15</td>
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<tr>
<td>Female</td>
<td>51</td>
<td>77.3</td>
<td>68</td>
<td>93.2</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>100</td>
<td>73</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>38.55</td>
<td>34.67</td>
<td>36.51</td>
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<tr>
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Training of stigma & discrimination

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<td>100</td>
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</table>

*Chi Square Test

Table 2 shows that there was a statistically significant difference in stigma between the group of VCT and PITC on people living with HIV/AIDS, which the mean of stigma in the PITC group (73.07) was higher than the mean value in the VCT group (66.61).

Table 2 Difference of stigma between VCT and PITC groups on PLWHA using Mann-Whitney

<table>
<thead>
<tr>
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<th>Median (min-max)</th>
<th>Mean (CI95%)</th>
<th>p-value</th>
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<td>VCT</td>
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<td>PITC</td>
<td>1 (1-4)</td>
<td>73.07 (1.06-1.35)</td>
<td></td>
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</table>

DISCUSSION

Findings of this study revealed there was a significant difference in mean value of stigma between VCT and PITC counseling officers towards PLWHA. The mean of stigma in the PITC group was higher than the mean value in the VCT. This result supports the previous study that majority of patients prefer VCT (66.1%) which is initiated by patients themselves compared with PITC initiated by health workers (11.6%) and independent testing (22.3%) (Van Dyk, 2013). This occurs with the reason that VCT approach prioritizes patient autonomy, no human rights violations, and keeps confidentiality of the testing results (Van Dyk, 2013). In addition, the VCT approach increases the scope of case discovery and reduces the level of HIV/AIDS stigma (Mall, Middelkoop, Mark, Wood, & Bekker, 2013). This is in line with a previous study (Misir, 2013) stated that counseling through the VCT approach is significantly correlated with a decrease in stigma.

However, the result of our study is also in contrast with another study (Ogbo et al., 2017) indicated that the PITC strategy is very acceptable and feasible, and increases the number of patients tested for HIV by 5% compared to VCT. It is also said that the utilization of HIV testing increases after PITC compared to VCT, therefore PITC must be expanded and evaluated rigorously (Kennedy et al., 2013).

On the other hand, another study (Silvestri et al., 2011) indicated that there was no significant difference VCT and PITC approaches in finding new cases. However, the others said that both VCT and PITC counseling approaches show the results of good counseling practices including the process of patient approval, confidentiality aspects, counseling processes, and referrals for follow-up care, so that both can be used to increase the coverage of HIV/AIDS cases (Wanyenze et al., 2013). But this is certainly supported by trained counseling officers in both VCT and PITC by not stigmatizing...
Based on the results of this study, the evaluation of the PITC implementation curriculum and training for health workers are necessary. A study stated that stigma reduction training programs carried out for health workers in Bangladesh showed a substantial decrease in stigma among health workers in men who have sex with men, young people who are active sexual or involved in immoral behavior (Geibel et al., 2017). Therefore, stigma reduction training materials can be included in the PITC training curriculum. Additionally, monitoring and supervision from professional counselors is needed to evaluate the performance of PITC officers related to stigma and discrimination.

CONCLUSION

There is a significant difference in stigma between VCT and PITC officers towards PLWHA. It is suggested that training curriculum in PITC should be evaluated and supervision in both VCT and PITC groups should be implemented regularly to reduce the stigma in PLWHA.

Declaration of Conflicting Interest
None declared.

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Authors Contribution
All authors equally contributed in this study.

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MOH. (2014c). Regulation of Minister of Health of the Republic of Indonesia No 87 in 2014 on guideline...
counseling officers

MORTALITY OF HIV/AIDS-INFECTED PEOPLE WITH ANTIRETROVIRAL THERAPY: A GENDER ANALYSIS

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Abstract
Background: Mortality in people living with HIV/AIDS is one of measures to the success of its treatment. Study related to their deaths seen from gender is still very limited.

Objective: The aim of this study was to determine the incidence rate of mortality between men and women living with HIV/AIDS and receiving antiretroviral therapy.

Methods: This was a retrospective study using secondary data of HIV/AIDS-infected patients in Buleleng District Hospital in the period of 2006-2015. This research used survival analysis, Kaplan-meier, incident rate comparison and logistic regression with STATA SE 12.

Results: A total of 1204 HIV/AIDS-infected patients’ data was included. The incidence of total mortality rates was 27.7 per 1000 person-years. Based on gender, the mortality in men (35 per 1000 person-years) was higher than women (14 per 1000 person-years) with the incidence rate ratio (IRR) of 2.39 (p 0.01). Fifty percent of cases of mortality occurred at 0.15 years of observation. The median time of mortality in men was 0.14 years (1.7 months) and in women was 0.15 years (1.8 months). The poor clinical condition was seen from a body weight <50 kg, which increased the risk of death with aOR 3.85 (p 0.01 CI 2.40-6.16). Nevirapine increased the risk of mortality (aOR 2.18; p 0.01; CI 1.18-4.03). and CD4 cell counts of ≤ 200 cells / mm3 reduced the risk of death by 69% (AOR 0.31; p 0.01; CI 0.18-0.53).

Conclusion: The incidence of mortality in men was greater than it in women, which is caused by poor clinical conditions. It is better to evaluate the success of antiretroviral therapy by considering the needs of patients according to their gender. Further research is needed in regard to adherence of treatment and loss to follow-up events.

Keywords: HIV/AIDS; gender; mortality; antiretroviral therapy

INTRODUCTION

HIV / AIDS epidemic is still a global issue that needs special attention. Various programs are developed to achieve the goal of reducing the risk of transmission. The four pillars of HIV/AIDS prevention in Indonesia that lead to a paradigm zero new infection, zero AIDS-related death and zero discrimination include prevention, care, support and treatment, mitigation of impacts, and preparation of a conducive environment (MOH, 2010, 2011a). Indicators to measure the success of antiretroviral (ARV) therapy programs in people living with HIV are the mortality rate and loss to follow-up (LTFU) rate. Both measures are very influential in the
continuity of therapy. Bali was the seventh highest province in Indonesia for the mortality of people living with HIV/AIDS (PLHA) in ARV therapy. Although it is still below the national mortality percentage (18.04%), but still far from the target of zero AIDS-related death (ASEAN Nations, 2011).

Common clinical conditions associated with the incidence of mortality in PLHA are weight, CD4 cell count, clinical stage and functional status. Thus, ARV therapy requires adherence to therapy so that patient compliance must always be monitored and evaluated regularly at each visit. Failure of ARV therapy is often caused by non-adherence patients taking ARV (Lamb, El-Sadr, Geng, & Nash, 2012; MOH, 2011a; WHO, 2013). And gender is one of the variables that greatly determines the pattern of adherence in ARV therapy. Risk of mortality in men tends to be higher (RR 1.19, aSHR 1.7) compared to women (Hawkins et al., 2011; Mugisha et al., 2014). Men have different adherence than women, and they still have worse treatment. While women have a greater position in matters related to depression, stress, stigmatization, and social roles related to gender (Applebaum, Richardson, Brady, Brief, & Keane, 2009). In addition, social and cultural stigma is more likely with men and related to the prevention, awareness, and treatment of diseases (Mitra & Sarkar, 2011). However, the results of gender studies related to ARV therapy are still inconsistent. Studies on gender analysis in the case of mortality in PLHA with ARV therapy in Indonesia, especially in Bali Province are still limited. The aim of this study was to describe the incidence rates of mortality based on gender analysis.

**METHODS**

**Study design**

This was a retrospective study with secondary data of HIV/AIDS-infected patients receiving ARV therapy at the District General Hospital of Buleleng District from 2006 to 2015. This research was conducted at Edelweis VCT Polyclinic of Buleleng District Hospital from January to August 2017.

**Sample**

A total sample of 1204 people were retrieved from the medical records based on the inclusion criteria. Surveys via telephone and home visits were made for special patients with lost to follow-up (LTFU) accompanied by field officers from NGOs. The sample research selection procedure is illustrated in Figure 1 below:

**Ethical consideration**

The study permission was obtained from Buleleng District Hospital. And the ethical clearance was approved by the Ethics Commission of the Faculty of Medicine, Udayana University/Sanglah Hospital Denpasar with approval number: 2611/UN.14.2/KEP/2017.

**Data analysis**

STATA SE 12 version was used for data analysis. Univariate analysis was used to
obtain the incidence rate of death rate per 100 people according to a year and adjusted odds ratio, in addition to the median time of mortality until the end of the observation year. Bivariate analysis with p-value and survival rate was used to see the significance of the differences between the respective groups. The value of the crude Odds Ratio (cOR), p specific, and p of OR crude from each independent variable to mortality were performed using logistic regression with a 95% confidence level. The Parm test was used when the nominal independent variable was for three or more categories, and we used a test for the trends when the ordinal data or intervals were in two or more categories. Logistic Regression with backward model was used for multivariate analysis. The insignificant variables were removed from the model until the final model was obtained.

RESULTS

The results of the study from 1204 data on PLHA patients who met the inclusion criteria showed that the percentage of death cases was 9.30%. The proportion of mortality in men was 79.46% and females were 20.54%. The incidence rates of death

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nucleoside reverse transcriptase inhibitors (NRTIs)
non-nucleoside reverse transcriptase (NNRTI)
were 13.1 per 1000 person-years with a median time of death at 0.15 years (1.8 months) of observation. This condition shows that, out of 112 deaths in PLHA receiving ARV therapy, 50% of deaths occurred in 5.25 years after therapy. The incidence rates of mortality in men were 35 per 1000 person-years while in women were 14 per 1000 person-years.

It can be seen from Table 1 that the mortality in men is higher than it in women in each sociodemographic variable, which was 81.48% of death in terms of age <40 years, 87.65% from the present of support, and 86.42% from distance to the service center (more than 5 km). Before treatment policy in 2011, the mortality was 53.09%, which was also higher seen from the clinical conditions, such as from body weight ≤ 50 kg (72.2%), CD4 ≥ 200 cell / mm$^3$ (92%), bed rest functional status (57.14%), stage 3 and 4 (94.4%), zidovudine therapy (76.92%) and nevirapine therapy (79.49%). Table 2 shows that the incidence rates of mortality in men were 35 per 1000 person-years, which is higher than women with 14 per 1000 person-years (See also Figure 2).

Table 2 Comparison of Incidents Rate Based on Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Rate Per 1000 Person years</th>
<th>Incidence rate ratio (IRR)</th>
<th>p-value</th>
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</thead>
<tbody>
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<td>Female</td>
<td>14</td>
<td>2.39</td>
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<tr>
<td>Male</td>
<td>35</td>
<td></td>
<td></td>
</tr>
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</table>

Table 3 Bivariate and Multivariate Analysis of Gender Differences in the Death of PLHIV with ARV Therapy

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<th>Multivariate</th>
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<tr>
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<td>1.00 (ref)</td>
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</tr>
<tr>
<td>≤ 50 kg</td>
<td>3.97</td>
<td>2.37-6.67</td>
</tr>
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<td>CD4 count</td>
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<tr>
<td>≥ 200 cell / mm$^3$</td>
<td>1.00 (ref)</td>
<td></td>
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<tr>
<td>&lt;200 cell / mm$^3$</td>
<td>0.35</td>
<td>0.19-0.66</td>
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<td>Bed rest</td>
<td>1.00 (ref)</td>
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</tr>
<tr>
<td>Ambulatory</td>
<td>0.96</td>
<td>0.34-2.69</td>
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<td>0.35-3.04</td>
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<td>Stadium 3 &amp; 4</td>
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<td>0.55-1.83</td>
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<tr>
<td>Policy</td>
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<tr>
<td>Policy before 2011</td>
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</tr>
<tr>
<td>Policy after 2011</td>
<td>0.69</td>
<td>0.32-1.50</td>
</tr>
<tr>
<td>NRTI tetofovir, fdc</td>
<td>1.00 (ref)</td>
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</tr>
<tr>
<td>stavudin</td>
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<td>0.01-1.47</td>
</tr>
<tr>
<td>zidovudin / duviral</td>
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<td>0.19-1.48</td>
</tr>
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</tr>
<tr>
<td>Distance to service center</td>
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<tr>
<td>&gt; 5 km</td>
<td>1.28</td>
<td>0.57-2.92</td>
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</table>
Bivariate analysis seen from Table 3 indicates that only three variables fit with the model. The results show that the absence of adherence support and distance to the service center (>5 km) increased the risk of death, but were not statistically significant. While weight < 50 kg (cOR 3.97; p= 0.01) and nevirapine therapy users (cOR 3.67; p= 0.01) were two variables that increased the risk of death and were statistically significant. And CD4 counts > 200 cells / mm³ (cOR 0.35; p=0.01) decreased the risk of death and was statistically significant.

The results of multivariate analysis in Table 3 also showed that three variables related to death. Weight <50 kg was 3.85 times increasing death (Adj OR 3.85 95% CI 2.40-6.16 p=0.01). ARV Therapy in NNRTI and Nevirapine were 2.18 times increasing death (Adj OR 2.18 95% CI 1.18-4.03 p=0.01). CD4 with level < 200 cell / mm³ decreased death until 64 % (Adj OR 0.31 95% CI 0.18-0.53 p=0.01).

DISCUSSION

The incidence rates of mortality in men were 35 per 1000 person-years while in women were 14 per 1000 person-years. This result is in line with several studies, which found that the incidence of mortality rates in men was higher than in women (Hawkins et al., 2011; Taylor-Smith, Tweya, Harries, Schoutene, & Jahn, 2010; Weigel et al., 2012). Non-adherence to treatment contributes to death by up to 50% (Brinkhof, Pujades-Rodriguez, & Egger, 2009; Wubshet, Berhane, Worku, & Kebede, 2013). The incidence rate ratio (IRR) was 2.39 (p 0.01), which showed that the risk of mortality in men was 2.39 times that of women.

The success of ARV therapy requires adherence to therapy for HIV/AIDS patients, so the adherence of a patient must be monitored and evaluated regularly at each visit. Failure of ARV therapy is often caused by non-adherence to patients taking ARV (Lamb et al., 2012; MOH, 2011a; WHO, 2013). ARV therapy requires maximum adherence.

Men have a tendency to behave worse in adherence to treatment. They tend to come to health services with poor clinical conditions so that the risk of death is greater (Brinkhof et al., 2009; Brinkhof et al., 2010; Gabillard et al., 2013; Weigel et al., 2012; Wilkinson, Skordis-Worrall, Ajose, & Ford, 2015).

Multivariate analysis with backward model shows three characteristics that have been statistically significant to increase the risk of death. Weight less than 50 kg increases the
risk of death by 3.85 times. Body weight was the clinical indicator of the quality of life of PLHA. Body weight is a reference commonly used to assess nutritional status. People with HIV who start therapy weighing less than 45 kg are more at risk of death. Weight loss > 10% is a common symptom experienced when infected with HIV (Dalal et al., 2008). On the contrary, every one kilogram increased in body weight reduced the risk of death in PLHA who experienced LTFU by 6% (HR 0.94; p = 0.035 (CI 0.89-0.99) (Kusuma Dewi & Widiarta, 2018).

ARV regimen consisted of nucleoside reverse transcriptase inhibitors (NRTIs) and non-nucleoside reverse transcriptase (NNRTI). Nevirapine (NVP) increases the risk of death by 2.18 times. The antiretroviral regimen related to drug characteristics and side effects and the easy of access to ARVs impact on the compliance of PLHA (Ford et al., 2013; MOH, 2011b). NVP has a greater level of toxicity in the general population, where the toxic effects reach 1.5 times (OR 1.5, 95% CI 0.9-2.3) (Ford et al., 2013). Nevirapine also increases the risk of death in PLHA who experienced LTFU by 3.92 (Kusuma Dewi & Widiarta, 2018). Severe side effects certainly contributed to the case of the death of PLHA. When starting therapy with a higher CD4 in 350 cell / mm$^3$ can reduce the effect of toxicity on PLHAs (Clouse et al., 2013; MOH, 2011a). The rate of CD4 becomes a benchmark for the health status of PLHAs and immunological failure indicators in ARV therapy. CD4 examination completes clinical examinations that can guide in determining the time to start treatment prophylaxis against opportunistic infections (OI) and ARV therapy before the disease continues to worsen. CD4 levels ≤ 200 cells / mm$^3$ reduced the risk of death by 69% with aOR 0.31 (p 0.01 CI 0.18-0.53). This condition is inversely proportional to research, which states that a low CD4 cell count can increase the risk of death (Clouse et al., 2013; Gabillard et al., 2013).

The limitation in this study is that there are still gaps in CD4 variables that cannot yet be explained in detail so that further research is needed to link the CD4 count with the risk of death by looking at the magnitude of the effect. Qualitative research is also needed to look at the treatment and loss-to-follow-up by gender-based.

**CONCLUSION**

The incidence of mortality in men was 2.39 times greater than women and poor clinical conditions tend to worsen the health condition of PLHA so the risk of death was even greater. The incidence rate of death rates in men was 35 per 1000 PY while in women14 per 1000 PY. Poor clinical conditions with a body weight below 50 kg increase the risk of death by 3.85 times. The level of nevirapine (NVP) NNRTI toxicity increases the risk of death by 2.18 times. CD4 cell counts less than 200 cells / mm$^3$ reduce the risk of death by 69%. It is better to evaluate the success of ARV therapy considering the study and differences in needs between women and men. Further research needs to be carried out on the adherence of treatment and loss to follow-up (LTFU) gender-based events.

**Declaration of Conflicting Interest**

None declared.

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**Author Contribution**

All authors equally contributed in this study.

**References**


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THE CORRELATION BETWEEN FAMILY SUPPORT AND RELAPSE IN SCHIZOPHRENIA AT THE PSYCHIATRIC HOSPITAL

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Abstract
Background: Schizophrenia is a severe mental illness with the majority of patients’ experiences relapses. Family support is not a new topic, but still considered as an important factor to prevent the relapse. However, little is known about the correlation between family support and relapse in schizophrenia patients in North Sumatra, Indonesia.
Objective: This study aims to examine the relationship between family support and relapse in schizophrenia.
Methods: This was a correlational cross-sectional study conducted from January to May 2015 at the psychiatric hospital in Medan North Sumatra Indonesia. There were 90 samples selected using purposive sampling. Chi-square test was used to analyze the data.
Results: Findings of this study reveals that there was statistically significant relationship between family informational support (p=0.00), appraisal support (p=0.00), instrumental support (p=0.00), and emotional support (p=0.00) with relapse in schizophrenia.
Conclusion: There is a significant correlation between family support (informational support, appraisal, instrumental and emotional support) and relapse in schizophrenia. Therefore, it is recommended that health care professional should continuously promote the important of family support and increase their knowledge regarding the type of supports needed for patients with schizophrenia.

Keywords: schizophrenia; family support; relapse

INTRODUCTION

Schizophrenia is a severe mental disorder, which has long-term effect on mental health of an individual. People with schizophrenia often difficult in processing information, having interpersonal relationships, and having additional mental health problems such as anxiety disorders, major depressive illness, or substance-use disorders (Stuart & Sundeen, 2007). The compliance to the schizophrenia medications is poor, as only approximately 50% of the prescribed medication is consumed although a compromised compliance has extensive clinical and economic consequences (Skarsholm, Stoevring, & Nielsen, 2014). In the past two decades, a growing body of research has called attention to the association between childhood adversity and psychotic disorders, particularly schizophrenia, and patients with psychotic disorders that have high rates of self-reported childhood abuse and neglect, ranging from 30% to over 75% (Rajkumar, 2015). Mortality in schizophrenia is high, especially due to suicides. Several early predictors of outcomes...
have also been found. Individuals with schizophrenia have alterations in brain morphometric and neurocognition, and our late studies have found that the use of high life time doses of anti-psychotics associated with these changes (Jääskeläinen et al., 2015).

Over the past 50 years, as evidenced by the closure of mental hospitals and advent of community-based care, there has been transition of care for schizophrenia patients from formal hospital-based healthcare systems to outpatient and community services. The financial burden (in terms of direct and indirect costs) of community-dwelling patients with schizophrenia is high with estimated annual costs in the US of $23 billion (Gater et al., 2014). If ten percent of the population experiences mental health problems, then we must pay attention. It is estimated that there are about 450 million people worldwide experience mental health disorders. The prevalence of patients with schizophrenia is about 0.2% to 2%, while the incidences or new cases that appear every year are about 0.01%. There are more than 80% of patients with schizophrenia in Indonesia is not handled optimally by either the family or the medical team (Yosep & Sutini, 2014).

Based on the data in the United States, each year there is about 300,000 schizophrenia experiencing episodes of acute. The prevalence of schizophrenia is higher than Alzheimer’s disease, multiple sclerosis, the client with diabetes taking insulin, and muscle disease (muscular dystrophy), and 20% - 50% of schizophrenia patients attempted suicide, and 10 % of them death to suicide, and death rate of the schizophrenia is 8 times higher than the death rate of the population in general (Yosep & Sutini, 2014). According to the results of the household health survey in Indonesia, it is estimated as many as 264 of the 1,000 members of the households suffering from mental health disorders. And the incidence of Schizophrenia in Indonesia reached 0.46%, and those who are experiencing psychotic severe disorders are about 2% in Jakarta, 1.9% in Aceh, and 1.6% in West Sumatra. It is about 50% - 53% of patients having schizophrenia relapse, which is one of the challenges that has been facing by health care professionals in Indonesia (A. I. Setiadi, 2006) such as mental disorder rate occurrence in Central Java in 2008 reached 3768 patients, and increased to 3914 in 2010 (Setiadi, 2008).

Relapse in schizophrenia is broadly recognized as the reemergence of the worsening of psychotic symptoms. More specifically, certain criteria are used to define relapse; they include aggravation of positive or negative symptoms, hospital admission in the past 6 months, and more intensive case management and/or a change in medication. According to Kazadi study finding that Co-morbid depressed mood, poor adherence owing to lack of insight, medication side-effects and lack of family support were the factors most likely to increase the risk of relapse in patients with schizophrenia. Risk of relapse may be reduced when the treating psychiatrist identifies and addresses these factors (Kazadi, Moosa, & Jeenah, 2008).

However, as lack of the studies focusing on schizophrenia relapse in North Sumatra Indonesia, therefore this study aims to identify the correlation between family support and schizophrenia relapse. Despite so many factors affect to healing schizophrenia, this study only emphasize on family support as family is the key factor in healing patients with schizophrenia.

METHODS

Study design
This was a correlational cross-sectional study that was conducted from January to May 2015 at the Psychiatric Hospital of Prof. Dr. Muhammad Ildrem in Medan North Sumatra Indonesia.

Sample
There were 90 samples selected using purposive sampling. The inclusion criteria were all family members who have a family member with schizophrenia in both inpatient
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and outpatient, able to communicate well, conscious and willing to be respondents.

Instrument

The instruments to measure family support and schizophrenia relapse were adopted from the previous research (Nursia, 2011). Schizophrenia relapse was measured by observing how many times of relapse during the last two years. While family support questionnaire consists of twenty statements using Likert scale: always, often, rarely and never, with total scores of 80. The dimension of the instrument includes informational support, appraisal, instrumental and emotional support. The score from respondents is converted into two-interval scale, namely good and less support. Good support if the score is >50 and less support if the score is <50.

Ethical consideration

Ethical approval of this research was obtained from The Commission of Conduct Health Study, Faculty of Nursing, North Sumatra University with approval number: 1292/IV/SP/2015. Each participant signed informed consent prior to data collection.

Data analysis

Chi-square test was used for data analysis.

RESULTS

Characteristics of respondents in the Table 1 showed that the majority of respondents aged 40-49 years (47.8%), followed by the age group of 30-39 years (37.8%), which was considered as young and productive group. Most of respondents were having senior high school background (46.7%) and bachelor level background (36.7%). And majority of them were self-employed. There was a slightly difference between male (53.3%) and female (46.7%) participants who experienced relapse in schizophrenia in this study.

Table 1 Characteristic of respondents (N=90)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 – 39</td>
<td>34</td>
<td>37.8</td>
</tr>
<tr>
<td>40 – 49</td>
<td>43</td>
<td>47.8</td>
</tr>
<tr>
<td>50 – 59</td>
<td>11</td>
<td>12.2</td>
</tr>
<tr>
<td>60 – 69</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48</td>
<td>53.3</td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>46.7</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>Junior high school</td>
<td>14</td>
<td>15.6</td>
</tr>
<tr>
<td>Senior high school</td>
<td>42</td>
<td>46.7</td>
</tr>
<tr>
<td>Bachelor</td>
<td>33</td>
<td>36.7</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>24</td>
<td>26.7</td>
</tr>
<tr>
<td>Self-employee</td>
<td>34</td>
<td>37.8</td>
</tr>
<tr>
<td>Private-employee</td>
<td>28</td>
<td>31.1</td>
</tr>
<tr>
<td>Civil servant</td>
<td>4</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Table 2 shows that more than 50% of family members have good family support, which consist of informational support (60%), appraisal support (58%), instrumental support (58%), and emotional support (66%). It also shows that the schizophrenia patients who have less supports from family members tends to have more relapses then those who have good family supports. There were 31% of patients relapse with less informational support, 27% of patients with less appraisal support, 12% of patients with less instrumental
support, and 26% of patients relapse with less emotional support.

Table 2 Frequency distribution of family support and relapse in schizophrenia (N=90)

<table>
<thead>
<tr>
<th>Family Support</th>
<th>Category</th>
<th>Relapse</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F %</td>
<td>No</td>
<td>Relapse</td>
<td>F %</td>
</tr>
<tr>
<td>Informational support</td>
<td>Good</td>
<td>8</td>
<td>9</td>
<td>46</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>28</td>
<td>31</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36</td>
<td>40</td>
<td>54</td>
<td>60</td>
</tr>
<tr>
<td>Appraisal support</td>
<td>Good</td>
<td>12</td>
<td>13</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>24</td>
<td>27</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36</td>
<td>40</td>
<td>54</td>
<td>60</td>
</tr>
<tr>
<td>Instrumental support</td>
<td>Good</td>
<td>43</td>
<td>48</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>11</td>
<td>12</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>54</td>
<td>60</td>
<td>36</td>
<td>40</td>
</tr>
<tr>
<td>Emotional support</td>
<td>Good</td>
<td>13</td>
<td>14</td>
<td>46</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>23</td>
<td>26</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36</td>
<td>40</td>
<td>54</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 3 shows that there was a statistically significant relationship between informational support (p=0.00), appraisal support (p=0.00), instrumental support (p=0.00), and emotional support (p=0.00) with relapse in schizophrenia in the Psychiatric Hospital of Prof. Dr. Muhammad Ildrem in Medan North Sumatra Indonesia. This result showed the strong evidence that family support is very important for those who are experiencing schizophrenia to prevent relapse.

Table 3 The correlation between family support and relapse in schizophrenia using Chi-square (N=90)

<table>
<thead>
<tr>
<th>Family Support</th>
<th>Relapse</th>
<th></th>
<th></th>
<th>No relapse</th>
<th></th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F %</td>
<td>No</td>
<td></td>
<td>F %</td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td>Informational support</td>
<td>Good</td>
<td>54</td>
<td>60</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>36</td>
<td>40</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td>Appraisal support</td>
<td>Good</td>
<td>52</td>
<td>58</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>38</td>
<td>42</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td>Instrumental support</td>
<td>Good</td>
<td>52</td>
<td>58</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>38</td>
<td>42</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td>Emotional support</td>
<td>Good</td>
<td>59</td>
<td>66</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>31</td>
<td>34</td>
<td></td>
<td></td>
<td>.00</td>
</tr>
</tbody>
</table>

DISCUSSION

Findings of this study revealed that there was a significant correlation between family support and relapse in schizophrenia patients. In this study, family support is divided into informational support, appraisal, instrumental and emotional support. This finding is in line
with previous studies showing that there were significant correlation between family support (informational, appraisal, instrumental and emotional) and social functions of patients with schizophrenia (Hartanto, 2014; Sefrina, 2016); but this result is in contrast with (Nursia, 2011) found that there is no significant relations between family support with repeated treatments of patients with mental disorders (p=0.217).

The result of this study is in contrast with previous study (Nursia, 2011) stated that there is no significant relationship between informational support with repeated treatments of patients with mental disorders. It is probably due to this study is specifically focusing on schizophrenia, instead of measuring the whole patients with repeated treatments in the hospital. However, according to literature (Friedman, 2008), family should always provide information about the benefit of medicine and give advice to patients to take the medicine regularly. Informational support may include giving advice, instructions, and explanations of how a person behave and act when in the stress situation and solve the problems.

Appraisal support is also correlated with relapse in schizophrenia patients in this study. Appraisal support means that the families involves the patients in day activities and always give positive reward or feedback in every activity to increase a sense of confidence and feel valued by the family. In contrast, no appraisal support will reduce patient’s confidence, feel devalued and useless and the risk of relapses increased (Friedman, 2008).

Family support in relation to instrumental support refers to the real direct support such as providing facilities, money, foods and daily needs, which is not only about physical needs, but also about the time spending with them. Patients will be more motivated because the family always provides assistance both morally and materially. The majority of the families are just paying attention to the time for the next treatment of visit to the hospitals as a routine, with less attention to the real needs of the patients. As there is a significant correlation between instrumental support and relapse, thus this kind of support should be informed to the family member.

The other important support in this study is emotional support, which has a significant relationship with relapse. Emotional support by family members may include expressions of empathy, such as listening, being open, trust towards what is complained of, understanding, expressing the affection and attention. Emotional support will make the patients feel valuable, comfortable, safe, peaceful, secure and loved (Friedman, 2008).

This study provides the insight of knowledge that family support is very important in the healing of the patient. Current practice guidelines for the treatment of patients with schizophrenia suggest a combination of antipsychotic medication plus individual and family interventions. Having a family available and supportive (regardless of the interpersonal issues between patient and family) improves outcome mediated by improving long-term adherence (Glick, Stekoll, & Hays, 2011). Thus, the need for family support and responsiveness in maintaining mental well-being should not be underestimated. There is a constant and deep longing for relatedness throughout life, which involves continuous, mutual balancing between the tension of giving and receiving (Lyberg, Holm, Lassenius, Berggren, & Severinsson, 2013).

**CONCLUSION**

Based on the results of the study, it can be concluded that there is significant correlation between family support (informational support, appraisal, instrumental and emotional support) and relapse in schizophrenia. Therefore, it is recommended that health care professional should continuously promote the important of family support and increase their knowledge regarding the type of supports needed for patients with schizophrenia.
Declaration of Conflicting Interest
None declared.

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Author Contribution
This is the original study of the corresponding author.

References

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THE EFFECT OF BODY REPOSITIONING ON HEMODYNAMIC STATUS IN PATIENTS WITH VASOPRESSOR THERAPY IN INTENSIVE CARE UNIT

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Abstract

Background: Repositioning the patients every 2 hours were often not implemented during patient care. One of the causes perceived by nurses as contraindications to repositioning in critical patients is the use of vasoactive agents. This condition increases the risk of decubitus, decreased orthostatic stability and muscle atrophy.

Objective: The purpose of this study was to identify the effect of body reposition on hemodynamic patients receiving vasopressor therapy in Intensive Care Unit (ICU).

Methods: The research method used Quasi Experiment with non-equivalent control group design. The subjects were ICU patients who received vasopressor therapy. The respondents recruited using consecutive sampling technique for a four-month period and obtained 34 respondents, which was divided into control and intervention group. Data analysis used paired t-test to analyze the difference in the same group and unpaired t-test to test the difference between two groups.

Results: Pre-post hemodynamic differences in the intervention group when patients were repositioned from supine to the right lateral and right lateral to left lateral showed p> 0.05. The hemodynamic difference between the control and the intervention group also had p> 0.05. The results showed there were no significant difference.

Conclusions: In general, there is no effect of body repositioning on hemodynamic status. Critical nurses can perform body repositioning activities every two hours including in patients with vasopressor therapy to prevent complications of immobilization, still considering contraindication condition.

Keywords: hemodynamic; ICU; repositioning; vasopressor

INTRODUCTION

Repositioning patients every 2 hours is a standard that must be implemented during patient care, but in practice these standards were often not implemented (Tayyib, Lewis, & Cover, 2013). The use of vasoactive agents that include inotropes and vasopressors in critical patients were often one of the reasons nurses did not provide lateral positions because nurses perceived these positions compromise the patient's hemodynamic status (Brindle et al., 2013). A study conducted in intubated patients found that patients who received vasopressor therapy tended to be rarely given a lateral position than a supine
position compared to patients who were not receiving vasopressor therapy (Schallom et al., 2005). Nurses perceived the use of vasoactive agents is a contraindication for tilting, whereas in accordance with its objectives, vasoactive agents play a role in increasing mean arterial pressure (MAP) through vasoconstriction of systemic blood vessels and increasing cardiac output through inotropic and chronotropic combinations to stabilize patients' hemodynamics and can allow the patient to continue the repositioning activities (Brindle et al., 2013; Djogovic et al., 2015).

Based on the mechanism of human body homeostasis, repositioning the patient's body every 2 hours can maintain hemodynamic stability. A study on gravity and aerospace flight discovered that astronauts in space within a certain time period (not exposed to gravity) experienced a decline in hemodynamic parameters and orthostatic intolerance within the first few days on Earth (Convertino, 2005). The absence of gravity lowers the vestibular and baroreflex responses that function in the hemodynamic equilibrium mechanism of gravity. The same concept can explain the conditions in immobilized patients. Patients who are in the same position for a long period will experience orthostatic intolerance (intolerance to movement associated with gravity). The activity of repositioning the patient's body every 2 hours is useful in training the vestibular and baroreflex responses so that the patient's hemodynamic status becomes more stable (Brindle et al., 2013; Vollman, 2012; Yap, 2018). However, little literature explains this condition, so that further research needs to be held.

Patients with prolonged bed rest will have an increased risk of muscle atrophy. Literature found that bed rest and immobilization leads to a decrease in muscle mass that may affect the musculoskeletal, cardiovascular, and respiratory systems (Koukourikos, Tsaloglidou, & Kourkouta, 2014). Muscle weakness in critically ill patients is one of the most common problems seen in ICU patients that characterized by bilateral and symmetrical muscle weakness. The percentage of ICU patients with multi-organ failure experienced a loss of muscle mass up to 100%. Muscle atrophy occurs in 80% of patients who use mechanical ventilation for more than 7 days. While in patients who used mechanical ventilation for 4 days, the incidence of loss of muscle mass decreased by 50% and in patients who used mechanical ventilation for 3 days, incidence decreased to 33% (Koukourikos et al., 2014). Prevention of muscle atrophy should be one of the main goals of ICU patient care, as it can reduce the incidence of the disease, length of stay, and improve the quality of life of the patient.

Patients who get vasopressor therapy but are not repositioned have a higher risk of injury. Study revealed in a literature review that the use of norepinephrine drugs was a significant risk factor for the incidence of pressure ulcer in ICU (De Laat et al., 2007). This was explained by previous study, which also showed the result of a significant relationship between the incidences of pressure injuries with the use of vasopressor agents. The hypotension conditions combined with the use of a persistent vasopressor agent serve as a warning sign that the patient has decreased perfusion to the skin for a long time thus increasing the risk of injury (Cox & Roche, 2015).

However, the safety of repositioning the body in critical patients using vasopressor against hemodynamics therapy remains unclear, research on this is also rarely done. It is related to ICU patient characteristics include severe disease severity, ventilator use, and physical mobilization limitations that cause hemodynamic imbalance. So, it is necessary to ensure the safe of body repositioning to the hemodynamic status in ICU patients receiving vasopressor agent therapy.

**METHODS**

*Study design and sample*

The research design was Quasi Experiment with non-equivalent control group design. The
population was all ICU patients at a referral hospital in Bandung, West Java, Indonesia who received vasopressor therapy with an average of 15 patients each month. The sample was determined using purposive sampling technique who had these following inclusion criteria: patients received vasopressor agent therapy; patients received a dose of a relatively stable vasopressor agent; patients’ MAP between 60 - 110 mmHg; patients’ heart rate more than 60 times/min and less than 130 times/min; patients’ oxygen saturation more than 93%; patients had not pelvic fracture and spinal cord injury; and patients did not have high intra cranial pressure. The study also had dropout criteria, they were: patients’ heart rate increased by more than 20 times/minute and did not recover after the first 10 minutes since the patients were tilted; patients’ MAP increased more than 110 mmHg or decreased less than 60 mmHg which did not recover after the first 10 minute since patients were tilted; desaturation occur and did not recover after the first 10 minute since the patients were tilted.

A total of 34 sample were selected and divided into control and intervention groups, with the calculation of the number of samples used the unpaired analytic descriptive formula, with a 95% confidence level, 80% test strength, standard deviation based on previous study (Anchala, 2016), and a significant mean difference in the control and intervention groups was determined one. Based on the calculation, the number of respondents was 17 for each group.

In the intervention group, the patient was repositioned every 2 hours. It was beginning with the supine position, then lateral right, left lateral, and returned to the supine position. Heart rate, MAP, and SpO2 data were taken 10 minutes after the patient was repositioned. In the control group there was no intervention only hemodynamic parameters were observed as long as the nurses performed nursing actions in accordance with routine care. Researchers observed and recorded heart rate, MAP, and SpO2 in the control group at the same time as recording hemodynamic parameters in the intervention group for one work shift (8 hours). Figure 1 illustrates the collecting data procedure.

**Instruments and data analysis**

Data to obtain the characteristics of respondents were collected using instrument consists of diagnosis, level of awareness, age, vasopressor agent, and vasopressor dose while heart rate, MAP and oxygen saturation collected using noninvasive hemodynamic monitor. Blood pressure was obtained based on the results of measurements of noninvasive hemodynamic monitoring and validated through daily calibration of the monitor. Heart rate was obtained through ECG that appears in noninvasive hemodynamic monitors and validated through manual calculations by counting the radial artery pulses, and oxygen saturation was obtained using pulse oximetry.

Characteristics respondents were analyzed using frequency distribution, whereas hemodynamic data consisting of heart rate, MAP and saturation were analyzed using mean and median for data that were not normally distributed. In the bivariate analysis, the data were analyzed to see the difference in pre-posttest in each group, and then a different test was carried out between two different groups. Paired t-test was used to analyze hemodynamic differences in each group while the unpaired t test was used to see hemodynamic differences in the two groups.

**Ethical consideration**

Ethical clearance for data collection had been obtained from the Research Ethics Committee of the Health Research Committee Faculty of Medicine Universitas Padjadjaran No. 512/UN6.C10/PN/2017. Informed consent was given and obtained from the respondent's relatives, and all agreed.
RESULTS

Respondents in this study were 34 and divided into control group and intervention group each group consisted of 17 respondents. Based on Table 1, it is shown that more than half of respondents are over 65 years old, and have a level of awareness that varies from comatose, apathetic (apatis), somnolent, and soporo coma. More than 70% of respondents are using ventilator and all respondents used epinephrine as a vasopressor agent with a very large majority of respondents received a dose of ≤ 10.1 mcg/kg/min norepinephrine in the control and intervention groups.

Based on the result which is shown in the Table 2 and Table 3, heart rate, MAP, and SpO2 between supine position (pre) and right lateral position (post) do not give significant changes (p> 0.05). Whereas in Table 4, HR between the left lateral position (pre) and supine position (post) shows significant changes (p=0.047; p<0.05), however, this significant change does not give meaning to the patient's clinical changes.
### Table 1 Respondents’ characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Group n (%)</th>
<th>Intervention Group n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumonia</td>
<td>1 (5.8)</td>
<td>8 (47)</td>
</tr>
<tr>
<td>COPD</td>
<td>2 (11.7)</td>
<td>1 (5.8)</td>
</tr>
<tr>
<td>CKD on HD</td>
<td>4 (23.5)</td>
<td>2 (11.7)</td>
</tr>
<tr>
<td>Post Explore Laparotomy</td>
<td>3 (17.6)</td>
<td>2 (11.7)</td>
</tr>
<tr>
<td>Cancer</td>
<td>2 (11.7)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>1 (5.8)</td>
<td>1 (5.8)</td>
</tr>
<tr>
<td>Anemia</td>
<td>1 (5.8)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Dehydration</td>
<td>1 (5.8)</td>
<td>2 (11.7)</td>
</tr>
<tr>
<td>Coronary Arterial Disease</td>
<td>1 (5.8)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Infarction stroke</td>
<td>1 (5.8)</td>
<td>1 (5.8)</td>
</tr>
<tr>
<td>Level of Awareness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compos Mentis</td>
<td>4 (23.5)</td>
<td>5 (29.4)</td>
</tr>
<tr>
<td>Apathetic (Apatis)</td>
<td>5 (29.4)</td>
<td>5 (29.4)</td>
</tr>
<tr>
<td>Somnolent</td>
<td>4 (23.5)</td>
<td>4 (23.5)</td>
</tr>
<tr>
<td>Soporo Coma (Stupor)</td>
<td>4 (23.5)</td>
<td>3 (17.6)</td>
</tr>
<tr>
<td>Using a ventilator</td>
<td>14 (82.3)</td>
<td>13 (73.4)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤65 years</td>
<td>8 (47)</td>
<td>6 (35.2)</td>
</tr>
<tr>
<td>&gt;65 years</td>
<td>9 (52.9)</td>
<td>11 (64.7)</td>
</tr>
<tr>
<td>Vasopressor Agent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norepinephrine</td>
<td>17 (100)</td>
<td>17 (100)</td>
</tr>
<tr>
<td>Vasopressor dose (mcg/kgweight/mnt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 0.1</td>
<td>12 (70.5)</td>
<td>13 (76.4)</td>
</tr>
<tr>
<td>&gt; 0.1</td>
<td>5 (29.4)</td>
<td>4 (23.5)</td>
</tr>
</tbody>
</table>

### Table 2 Comparison of mean of hemodynamic status (heart rate, MAP, SpO2) between supine (pre) and right lateral (post)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Supine (pre)</th>
<th>Right Lateral (post)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR (x/min)</td>
<td>98.12 ± 13.43</td>
<td>97.12 ± 14.87</td>
<td>0.367</td>
</tr>
<tr>
<td>MAP (mmHg)</td>
<td>76.71 ± 10.67</td>
<td>79.94 ± 12.40</td>
<td>0.567</td>
</tr>
<tr>
<td>SpO2 (%)</td>
<td>100 (97-100)</td>
<td>99 (97-100)</td>
<td>0.112</td>
</tr>
</tbody>
</table>

### Table 3 Comparison of mean of hemodynamic status (heart rate, MAP, SpO2) between right lateral (pre) and left lateral (post)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Right Lateral (pre)</th>
<th>Left Lateral (post)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR (x/min)</td>
<td>97.65 ± 14.74</td>
<td>97.29 ± 14.49</td>
<td>0.756</td>
</tr>
<tr>
<td>MAP (mmHg)</td>
<td>72 (60-101)</td>
<td>74 (10-110)</td>
<td>0.831</td>
</tr>
<tr>
<td>SpO2 (%)</td>
<td>100 (97-100)</td>
<td>100 (96-100)</td>
<td>0.739</td>
</tr>
</tbody>
</table>

### Table 4 Comparison of mean of hemodynamic status (heart rate, MAP, SpO2) between left lateral (pre) and supine (post)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Left Lateral (pre)</th>
<th>Supine (post)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR (x/min)</td>
<td>96.35 ± 15.00</td>
<td>94.53 ± 15.34</td>
<td>0.047</td>
</tr>
<tr>
<td>MAP (mmHg)</td>
<td>72 (60-108)</td>
<td>71 (61-102)</td>
<td>0.737</td>
</tr>
<tr>
<td>SpO2 (%)</td>
<td>100 (97-100)</td>
<td>100 (97-100)</td>
<td>0.480</td>
</tr>
</tbody>
</table>
Table 5 shows the data of mean of hemodynamic status (Heart Rate, MAP, SpO2) before and after 3 times reposition in intervention group. Based on the data HR, MAP and SpO2 between pre and post reposition in intervention group do not give significant changes (p>0.05).

Statistical test results in the Table 6 show that all noninvasive hemodynamic parameters have p> 0.05. This shows that there was no significant difference in the difference in changes in HR, MAP and SpO2 between the control group and the intervention group.

DISCUSSION

The results showed no significant changes in patients’ hemodynamic status (HR, MAP and SpO2) before and after repositioned to the right and left lateral positions. The same with patients’ HR, MAP and SpO2 before being repositioned and after following 3 changes in position every 2 hours-over a span of 8 hours-, did not experience significant changes. The same condition was shown by the hemodynamic difference between the intervention group and the control group. These results indicate the stability of the patients’ hemodynamic status during repositioning.

The stability of the hemodynamic status shown during the study was maintained by the coordination of the work of the cardiovascular and the nervous system. The use of ventilators by most respondents (control group = 83.3%; intervention group = 73.4%) and the level of awareness of the majority of respondents who are not fully conscious cause immobilization. Patients who experience immobilization had the potential to experience a decrease in coordination of interactions between the cardiovascular and the nervous system (Scanlon & Sanders, 2007). Immobilization also causes a decrease in the skeletal muscle pump mechanism, which is effective against deep veins in the legs. A decrease in skeletal activity can reduce leg muscle contractions, this can cause a decrease in the blood pump back to the heart by a vein, thereby reducing the amount of blood returning to the heart and potentially causing a decrease in blood pressure and orthostatic hypotension. However, during the research process, respondents did not experience significant changes in hemodynamic status, because all respondents received vasopressor therapy, which can increase systemic vascular pressure through vasoconstriction of systemic blood vessels and increasing cardiac output.
Norepinephrine is a group of vasopressors that act as the main endogenous neurotransmitters released by the adrenergic postganglionic nerve and are strong α1-adrenergic receptor agonists with moderate β-agonist activity. Norepinephrine has a fast working effect within 1-2 minutes by reaching the peak in less than 5 minutes. Norepinephrine is a powerful vasoconstrictor that increases systemic vascular resistance and is slightly inotropic causing increased cardiac contractility and working on baroreceptor stimulation, thus able to maintain hemodynamic stability (Overgaard & Dzavik, 2008). However, it was found that the hemodynamics of patients after repositioning were not immediately stable, it took 5 to 10 minutes for the patient's hemodynamics to return to their initial values. This showed that ICU patients with vasopressor therapy were relatively safe to be repositioned periodically. Vasopressor agent was actually able to maintain hemodynamic stability even though hemodynamic changes occurred; the changes were temporary. This study reinforced previous research, which stated that there was no change in SpO2 in ARDS patients who used mechanical ventilation, before and after being given the right lateral and left lateral positions (Vollman, 2012). Another study also stated that repositioning patients did not have a significant effect on cardiac index included MAP, right arterial pressure, pulmonary artery pressure edge, and pulmonary artery pressure in post CABG patients (De Laat et al., 2007).

Similar results were shown in patients receiving antihypertensive and or inotropic and vasoactive drug therapy. There was no significant cardiac index difference between the intervention group and the control group (p = 0.34). Patients with inotropic and or vasoactive therapy who were repositioned 4 hours after post-surgery tended to show a lower risk of cardiac index reduction compared to the control group (p = 0.13). During the study, there was no clinical cardiac index deviation, which could prevent the lateral position of the patient, even in patients using intra-aortic balloon pump.

Previous study with 20 ICU patients showed similar results where there were no differences in HR, SpO2, and MAP at various therapeutic positions including right lateral and left lateral positions. Anchala stated that scheduled therapeutic repositioning had an effect in maintaining stable hemodynamics and was also useful in preventing complications of immobilization. However, in his study it was not stated whether respondents used vasoactive drugs or not (Anchala, 2016).

Hemodynamic stability is supported by the consistency of vasopressor work. This is supported by the previous research (Oldenburg et al., 2001). The results of the study stated that conscious patients who were able to ambulate but experienced orthostatic hypotension due to primary autonomic failure were able to carry out sitting, standing, and walking activities after receiving norepinephrine drug therapy.

Based on the results of the study, there were different statistical test results. Statistical tests on HR when patients were repositioned from the left lateral position to the supine position showed significant differences (mean HR: 96.35 ± 15.00 to 94.53 ± 15.34; p = 0.047). This was different from the results of statistical tests on MAP and SpO2, which did not show significant changes (p = 0.737; p = 0.480; p> 0.05). HR changes can be caused because this parameter is the first cardiovascular system that responds when the sympathetic and parasympathetic nerves are activated when the patient is repositioned as a compensation mechanism. HR changes shown based on the study are not clinically meaningful and do not endanger the patient's hemodynamics, so that repositioning of the body can still be carried out.

There were differences in the results of the study, when repositioning is done with a higher degree of slope. This was shown by previous research (Aries et al., 2012) on 20 stable patients in the ICU who used invasive blood pressure measuring devices. Statistical tests showed a significant change in the mean MAP of 5 mmHg higher in the lateral position.
compared to the supine position (p <0.001), whereas between the right lateral position and the left lateral position there was no significant change, as well as the HR frequency and oxygen saturation which were relatively stable at all positions both supine and left lateral and right lateral position. This difference in results might be due to the respondents in the study being given a higher degree of slope (45°) during the lateral position, because this could affect changes in venous return and arterial pressure.

Additional result of this study found that, after repositioning, the patient's hemodynamic parameters were not immediately stable. To obtain hemodynamic stability after repositioning, adaptation time was needed. In this study the process of adaptation to hemodynamic change took 5 to 10 minutes to return or approach to the initial value. This was because, when the patient was repositioned especially when given a lateral position with a slope of 30°, there was gravity resistance, which causes an increase or decrease in arterial pressure. These pressure changes stimulated the nucleus tractus solitarius (NTS) in the brain stem causing the baroreceptors to respond and activate the sympathetic or parasympathetic nervous system and produced an increase or decrease in heart rate according to their need to maintain normal blood pressure (Carter & Ray, 2008). This mechanism is a temporary physiological mechanism, so that at the beginning of repositioning there is a temporary change in hemodynamic. The insignificant changes that are mostly shown in the results of this study can increase nurses' confidence in making a decision to choose to reposition the patient's every two hours considering the benefits to prevent various complications of immobilization.

This study supports the concept that patients in the ICU can generally be repositioned every 2 hours in accordance with the standards of nursing care (Brindle et al., 2013; Vollman, 2012). Vollman stated that the hemodynamics of patients with critical illness will be affected by changes in position, but most of the hemodynamic changes are transient. ICU nurses play an important role in carrying out the process of critical thinking and decision making so that the repositioning activities of the patient's every 2 hours can be done without endangering the patient (Vollman, 2012).

Limitation of the study

The limitation of this study was the diagnosis of the patient's disease was very varied with a small number of respondents and the simultaneous use of other drug therapies that might influence the hemodynamic status of patients was not considered in the study because research only focused on vasopressor use.

CONCLUSION

The results of the study statistically showed a significant change in HR when the patient was repositioned from the left lateral position to the supine position, but clinically the range of change was not significant. In general, there were no significant differences in hemodynamic status before and after the patient was repositioned. It can be concluded that there was no repositioning effect on hemodynamic status in ICU patients receiving vasopressor agent therapy.

Declaration of Conflicting Interest
None.

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Author contribution
All authors have contributed in the preparation of the manuscript. VOS provided article development, ideas, reviewed theories and literatures, analyzed and interpreted data. AN wrote the manuscript interpreted data, wrote and criticized the manuscript and made final approval of the manuscript.
References


PREVALENCE, PREVENTION, AND WOUND CARE OF PRESSURE INJURY IN STROKE PATIENTS IN THE NEUROLOGY WARD

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Abstract

Background: Stroke patient has a risk of experiencing pressure injury, which could affect patient’s life and quality of life; therefore, optimum pressure ulcer prevention should be done. Patients experiencing pressure ulcer should be given appropriate care, to prevent infection and worse conditions.

Objective: To identify the prevalence, prevention and treatment of pressure injury of stroke patients in the neurological ward.

Methods: This research was a quantitative descriptive research using Landelijke Prevalentiemeting Zorgproblemen instrument. The samples were collected using consecutive sampling method with inclusion criteria of stroke patients experiencing paraplegia, which obtained 30 respondents. Data were presented in frequency distribution format.

Results: The result showed that the prevalence of pressure injury was 3.3% of degree III and brought from home. Based on risk assessment, 43.3% of patients had a very high risk of getting pressure injury, and 56.7% had changed position, 100% had received nutritional support but 80% of patients had not received health education and 83.3% did not get a pillow on their heels, and 100% did not get pressure injury mattress, massage, moisturizing cream and oil. Treatment of pressure injury was using 0.9% NaCl liquid with hydrocolloid dressing.

Conclusion: It can be concluded that there are still some patients experiencing pressure injury and in terms of items of pressure injury prevention, which often done is malnutrition prevention, the least are the changes of position in using pillows, and in health education. The one that have never been done are the use of oil, moisturizing cream, massage and pressure air mattress. The injury treatment provided to the patient has been adequate. The suggestion that can be given is the preparation of standard operating procedure, leaflets and the provision of pressure air mattress.

Keywords: pressure injury; wound care; prevalence; prevention; stroke patient

INTRODUCTION

Pressure injury has many names such as pressure ulcer, bed sores, and pressure sore (Engels et al., 2016). National Pressure Ulcer Advisory Panel NPUAP defines pressure injury as a localized injury to the skin or tissue caused by the suppression of soft tissue between the protruding bone and the outer surface for a long period of time (NPUAP, 2016). Potter & Perry stated that pressure injury is a wound on the skin and / or underlying tissue, usually caused by a bony protrusion, as a result of pressure or combination of pressure with shear and / or friction forces. Respectively, it can be concluded that pressure injury is a wound on the skin or tissue caused by depressed tissue
by protruded bone for a long period of time (Potter & Perry, 2014).

Pressure injury becomes an important issue especially on patients with mobilization impaired. One of the conditions with a risk of experiencing impaired mobilization is stroke. Stroke is a condition that arises as a result of blood circulatory disorders in the brain that causes brain tissue death resulting in a person suffering paralysis or death (Batticaca, 2008). Motoric disorders in stroke patients occupy the largest number, i.e. 90.5%, which means that almost all patients experiencing motoric disorders (Misbach, 2011). These motoric disorders include hemiplegia, i.e. a weakness that occurs on one side of the body and the most severe is permanent paralysis which make it difficult for the patients to move freely, easily and regularly to meet their basic needs as a human being (Mubarak, Indrawati, & Susanto, 2015).

A research found that the most medical diagnosis causes pressure injury is stroke, i.e. 53.7% (Mutia, Pamungkas, & Angraini, 2015). This is in line with another study which stated that about 50% of pressure injury patients are with medical diagnosis of stroke (Okatiranti, Sitorus, & Tsuawabeh, 2013). Therefore, it can be said that the incidence of pressure injury is more prevalent in patients with medical diagnosis of stroke.

Research showed that stroke patients experiencing pressure injury have significantly higher risk of being infected not only at the wounds, but also other infections such as urinary tract infections and pneumonia (Lee et al., 2016). Moreover, stroke patients with pressure injury increase mortality rate more than stroke patients without pressure injury. The study above showed that there is an increase in complications in stroke patients experiencing pressure injury.

To avoid the impact that will be generated, prevention should be implemented optimally. In addition, patients who have experienced should be given appropriate treatment to avoid infection or worsening pressure injury to a higher degree. There is no data showing how far the prevention and treatment of pressure injury has been given to stroke patients, so researchers feel it is important to examine the prevalence, prevention and treatment of pressure injury in stroke patients.

METHODS

Study design
This study used descriptive research with quantitative approach.

Setting
This research was conducted in Neurology Ward One of Central Public Hospital in Indonesia in September 2017 until March 2018.

Sample
The number of samples obtained was 30 patients by using consecutive sampling method. Inclusion criteria in this study were immobilized stroke patients with criteria: 1) experienced paraplegia, 2) who had been hospitalized for at least three days.

Instrument
The instrument that used in this research was LPZ (Landelijke Prevalentiemeting Zorgproblemen), the LPZ questionnaire was developed in 1997 by Halfens, Bours, Lubbers, Piersma and Buss (van Nie-Visser et al., 2013). The LPZ questionnaire was translated into Indonesian (Y Amir, 2015), the content validity index of the questionnaire ranged from 0.50 to 1.00. This instrument consists of several parts, the first part contains data on the characteristics of respondents, other information related to patient history, the second part contains pressure injury prevention measures consisting of Braden scale and the third part about pressure injury that has occurred in patients.

Ethical consideration
This study was approved by the ethical committee on health research RSUP Dr. Hasan Sadikin Bandung with IRB approval number LB.04.01/a05/ec/354/XII/2017.
Data analysis
The analysis in this study was conducted with univariate to explain thoroughly and deeply about prevalence, prevention and treatment of pressure injury to stroke patients. Data analysis was the univariate that carried out on each variable of research result. Generally, in this analysis only produces distribution and the percentage of each variable.

RESULTS
From Table 1, most of the respondents were female (53.3%), mostly aged more than 65 years (56.7%), a small proportion of respondents had a history of bed rest (3.3%), and all respondents had no history of experiencing pressure injury for the last five years (100%).

Table 1 Frequency Distribution of Respondent Characteristics of Stroke Patients in the Neurology Care Room (n=30)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Quantity</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>16</td>
</tr>
<tr>
<td>Age</td>
<td>55-65</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>&gt;65</td>
<td>17</td>
</tr>
<tr>
<td>Bed Rest History</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>29</td>
</tr>
<tr>
<td>Pressure Injury History last 5 years</td>
<td>Yes</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>100</td>
</tr>
</tbody>
</table>

From Table 2, a small percentage of respondents had a Pressure injury with category 3, long-suffering less than or equal to 2 weeks, started suffering at home, Location of pressure injury was on the Coccygeal bone (3.3%).

And based on Table 3, almost half of the respondents had a very high risk of being exposed to pressure injury (43.3%), most respondents got a change of position (56.7%), all respondents received nutritional support (100%), almost all respondents did not get health education (80%), almost all respondents did not use pillow under the heel (83.3%), all respondents did not use oil (100%), all respondents did not use moisturizing cream (100%), all respondents did not use massage (100%), and all respondents did not use anti-pressure injury mattress (100%).

Table 2 Frequency Distribution of Stroke Patient in the Neurology Ward (n=30)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Quantity</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Injury</td>
<td>Yes</td>
<td>1</td>
<td>3.3%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>29</td>
<td>97.7%</td>
</tr>
<tr>
<td>Category of Pressure Injury</td>
<td>Category 3</td>
<td>1</td>
<td>3.3%</td>
</tr>
<tr>
<td>Length of Pressure Injury</td>
<td>≤ 2 weeks</td>
<td>1</td>
<td>3.3%</td>
</tr>
<tr>
<td>Start Suffering</td>
<td>Home</td>
<td>1</td>
<td>3.3%</td>
</tr>
<tr>
<td>Pressure Injury Location</td>
<td>Coccygeal bone</td>
<td>1</td>
<td>3.3%</td>
</tr>
</tbody>
</table>
Table 3 Frequency Distribution of Pressure Injury Prevention in Neurology Ward (n = 30)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Quantity</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Assessment of Pressure Injury</td>
<td>Moderate</td>
<td>6</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>11</td>
<td>36.7%</td>
</tr>
<tr>
<td></td>
<td>Very High</td>
<td>13</td>
<td>43.3%</td>
</tr>
<tr>
<td>Position Changes</td>
<td>Yes</td>
<td>17</td>
<td>56.7%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>13</td>
<td>43.3%</td>
</tr>
<tr>
<td>Malnutrition Prevention</td>
<td>Yes</td>
<td>30</td>
<td>100%</td>
</tr>
<tr>
<td>Health Education</td>
<td>Yes</td>
<td>6</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>24</td>
<td>80%</td>
</tr>
<tr>
<td>Pillow</td>
<td>Yes</td>
<td>5</td>
<td>16.7%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>25</td>
<td>83.3%</td>
</tr>
<tr>
<td>Oil</td>
<td>No</td>
<td>30</td>
<td>100%</td>
</tr>
<tr>
<td>Moisturizing Cream</td>
<td>No</td>
<td>30</td>
<td>100%</td>
</tr>
<tr>
<td>Massage</td>
<td>No</td>
<td>30</td>
<td>100%</td>
</tr>
<tr>
<td>Pressure Air Mattress</td>
<td>None</td>
<td>30</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4 Frequency Distribution of Wound Care in Stroke Patients in Neurology Ward (n = 1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Quantity</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning the Wound</td>
<td>Normal saline or portable water</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Debridement</td>
<td>No</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Wound Dressing</td>
<td>Hydrocolloids</td>
<td>1</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on Table 4, all respondents who experienced pressure injury wound cleaned with normal saline, no debridement, wound dressing used Hydrocolloids (100%).

DISCUSSION

Pressure injury prevalence

Based on the result of the study found that there was one patient who experienced pressure injury. According to NPUAP (2016) pressure injury is divided into four levels of pressure injury degree I, pressure injury degree II, pressure injury degree III, and pressure injury degree IV. The result showed the patient was in degree III. Pressure injury degree III is a complete loss of tissue, where tissue damage or necrosis reaches subcutaneous or deeper. The wound looks like a deep hole. Muscles, tendons, ligaments and bones are not visible.

Based on the results of this study patient suffering from pressure injury less than two weeks, in line with research by Amir (2015) that half of the patients had got pressure injury ≤ 2 weeks. Two weeks period is recommended to evaluate the development of wound healing (Pullen & Anhold, 2012). The length of this period can be used for nurses to detect early complications and to evaluate whether the treatment plan is continued or changed. In addition, once the nurse has information about how long the patient has been suffering pressure injury, it aims to inform the patient and family about the estimated duration of treatment and monitor the healing process.

The results of the study showed that patient’s pressure injury has emerged at home. This might be related to a lack of family’s knowledge in treating stroke patients who are immobilized, especially regarding preventative measures of pressure injury. Stroke patients who experience mobility impairment would find it difficult to change their position independently. Therefore, family assistance or care is vital to avoid the occurrence of pressure injury in the patient. The results of this study
are consistent with what was stated by Tuffaha et al. who found that 89.4% preliminary pressure injury took place at home. Similar results were also found by Amir (2015), half of the pressure injury (60%) had occurred before admission to the hospital and was a severe pressure injury category III and IV (42.3%) (Tuffaha, Roberts, Chaboyer, Gordon, & Scuffham, 2016).

The patient's pressure injury was present in the coccyx bone region. This coccyx bone is an area susceptible to pressure injury because of pressure by the bone and added with the long-time pressure. Pressure injury can occur anywhere on the surface of the body if it is exposed to continuous pressure. In line with previous research which stated that the areas most at risk for exposure to pressure injury are the sacral area (30–49%), heel (19–36%), ischium (6–11%), malleolus (7–8%), elbows (5–9%), iliac (4%), knees (3–4%), and the rest usually occur in the chin, occipital, scapula, pretilib and spinous process (Nix, Bryant, & Nix, 2012). Similarly, Palese et al. found that pressure injury is the most common in the sacral area of 64.4% (Palese et al., 2015).

**Pressure injury prevention**

Prevention of Pressure injury is very important to carry out because if it has happened, it might lead to various disadvantages for the patient, patient’s family, nurses and hospital. The recommended prevention from NPUAP consists of risk assessment, skin care (moisturizing cream, oil and massage), position and reposition (2–3 hours without pressure injury mattress and 4–6 hours if using pressure injury mattress), preventing or treating malnutrition and dehydration, and education or health education (NPUAP, 2016).

Based on the risk assessment, respondents who were at very high-risk experienced Pressure injury (43.3%), high risk (37.7%) and moderate risk (20%). This risk assessment was measured by Braden Scale. According to Braden Scale, the actions to prevent Pressure injury in patients with a very high Braden Scale are repositioning or changing the patient's position regularly, supporting the patient to mobilize, protecting the patient’s heel in order to prevent to be exposed the bed directly, using surface support and set the patient's skin moisture, setting lateral position of 30’ by using a foam pillow, and using pressure air mattress.

The routine use of the Pressure injury risk assessment tool in the clinical care setting in stroke patients is considered necessary for a comprehensive Pressure injury prevention program. Planning preventive care according to Braden Scale may be more effective in some cases compared to other measures (Mohamed & Weheida, 2014). However, study showed that there were nurses’ perceived obstacles in the risk assessment of Pressure injury that was lack of training (Moore, Cowman, & Conroy, 2011; Tallier et al., 2017). Less trained nurses will have an impact on their knowledge as well as skills when conducting the risk assessment of Pressure injury to a patient.

On item changing position, the results showed that majority of respondents changed position. It is in accordance with previous research (Yufitriana Amir, Tan, Halfens, Lohrmann, & Schols, 2017) in some existing hospital in Indonesia, found that the most frequent preventive measure is repositioning. Changing the position can boost blood circulation and improving the regulation of the body's metabolism, restoring the physiological work of vital organs and also allowing the pressured skin to be exposed to the air (Simanjuntak & Sirait, 2013).

Changing position to the patient was not yet in accordance with the NPUAP recommendation in which changing position is suggested every 2-3 hours in patients without using pressure injury mattress and 4-6 hours in patients using pressure air mattress. In the neurology ward, there were no patients who used support surfaces that meant each patient who has risk should be changed position every 2-3 hours. The nurses’ difficulties to change position in the ward are related to the high workload of
nurses and the lack of nurses while changing the patient’s position requires assistance from another nurse. In addition, evenly, the patients in the neurology ward are those who need total care, the full help from the nurse, it will inflict on the longer time in carrying out the intervention. In line previous research (Qaddumi & Khawaldeh, 2014) which stated that patient repositioning becomes one of pressure injury preventions which is perceived difficult by nurses, it is related to the lacking number of nurses while patient repositioning needs assistance from another nurse. It causes pressure injury prevention in repositioning item becomes less than optimal.

In nutritional variable the results showed that all respondents got malnutrition or dehydration prevention measures in the form nutritional and fluids status assessment, being monitored and treated while the results were reported, then being provided nutritional therapy based on recommendations. In the neurology ward, the nurse must perform nutritional screening of the patient within no more than 12 hours after the patient takes into the inpatient ward. Study (Tuffaha et al., 2016) mentioned that good nutrition intake of patients could decrease the prevalence of pressure injury exposure in patients at high risk of pressure injury. Nutrition is one of the important supporting factors to maintain healthy skin condition of patients and avoid pressure injury.

The sub-variables of health education to prevent pressure injury in this study showed that only a small proportion of respondents received a health education. Health education criteria given to patients in this study was health education using media leaflet aid, while in the neurology ward, the health education was largely given without using the media. Therefore, the result of this study might indicate that health education provided has not been effectively done. Information and health education on patients and/or families should be provided on the continuous and comprehensive basis in order to initiate the family’s participation in pressure injury prevention. It occurred because of lack of time the nurses had to perform health education to patients due to the high workload, where one nurse handled the average of six patients with total and partial care conditions. Health education related pressure injury could be assisted by using leaflet media. Once the nurses do not have enough time to perform health education, they can give leaflet about how to prevent pressure injury to patient's family.

Research (Sulasstri, Effendy, & Haryani, 2016) showed that there was an impact of health education about pressure injury prevention on family knowledge and involvement in preventing pressure injury in bed rest patients. Nurses who have the role as educators should perform health education to patients or the families to increase prevention of pressure injury.

In the sub-variable pillow provision on the foot area found almost all respondents did not use a pillow at the bottom of the foot. One of pressure injury preventions are with the provision of pillows in areas that have the risk of Pressure injury, such as heel and elbow area with the aim to minimize friction and pressure on the heel region to the mattress directly, as study (Lahmann, Tannen, Dassen, & Kottner, 2011) noted in the research that found the strongest predictor that causes pressure injury degrees I to IV is friction.

In this study, all patients did not use the moisturizing cream to protect the skin. Skincare is an independent nursing intervention that aims to maintain skin health. Skincare here means to maintain skin hygiene and skin moisture by giving lotions or creams. As research (Lechner, Lahmann, Neumann, Blume-Peytavi, & Kottner, 2017) revealed that dry skin causes damage to the skin barrier function and results in decreased elasticity, therefore, it is important to keep the patient's skin moist, either by lotion or body oil.

In sub-variable of using oil to protect skin, all respondents did not use oil to prevent Pressure injury. Based on the research (Utomo, Dewi, & Abdurrasyid, 2014), Nigella Sativa Oil is effective to prevent the occurrence of pressure
injury in bed rest patients. There is also an olive oil formula that can be applied to help prevent the emergence of pressure injury in patients, this treatment is low-cost and can be considered as an alternative treatment (Lupiáñez-Pérez et al., 2013).

In the massage variable found all respondents did not get a massage for pressure injury prevention. The recommended massage technique to give to the patient is effleurage which is slow and rhythmic hand movement, the massage passes distal to proximal and parallel to the long axis of tissue with medium pressure, massage is contraindicated when the tissue is inflamed and when the patient is prone to bleeding (ecchymosis), has abnormalities in the circulatory system (phlebitis, severe atherosclerosis), and has abnormal sensations due to stroke, diabetes, and treatment (Duimel-Peeters, Halfens, Berger, & Snoeckx, 2005). Massage at risky areas is administered once or twice daily in 15 minutes long of a single message that effective in preventing the patient's pressure injury (Duimel-Peeters et al., 2005).

Basically, the use of pillows, oil and moisturizer are the interventions that can be done by the patient's family independently. The cause of insufficient use of pillow, oil and moisturizer in pressure injury prevention in patients can be caused by the lack of families’ knowledge about what family can do to prevent pressure injury. Since actually patients or families already had oil (such as eucalyptus oil) and moisturizing cream (like body lotion) but the family did not use it for pressure injury prevention in patients. The knowledge about the use of pillow, oil and skin moisturizer can be included in the pressure injury prevention leaflet that can later be used as a media of health education for patients and families.

The results of this study showed no single patient who used support surfaces. The neurology ward has two pressure air mattresses, but both mattresses were currently in disrepair and unusable. As referring to Braden Scale prevention guidelines, patients at very high risk of having a pressure injury should use pressure air mattresses, it means 34.3% of patients at high risk of exposure to pressure injury in this study should use pressure air mattresses. According to previous study (Mirwanti, Agustina, & Nuraeni, 2017), to support the nurses in carrying out pressure injury prevention optimally, thus the addition of tools or facilities related to pressure injury prevention is necessary.

According to a study, it was found that the use of alternating pressure air mattress (APAM) was superior to the use of viscoelastic foam mattress (VFM) in pressure injury prevention in elderly patients with a moderate risk of pressure injury. The study showed that the risk of occurrence of pressure injury 7.57 times larger in the VFM patient group compared to the APAM patient group (Sauvage et al., 2017).

Wound care

The management of the pressure injury and the success of treatment should pay attention to few things, firstly, reducing pressure, debridement, controlling infection and the appropriate wound care (Kirman & Geibel, 2018). Wound care or appropriate wound care can speed up pressure injury healing or lower degree of pressure injury, avoid infection and the severity or increasing degree of pressure injury, which will certainly harm patients, nurses and hospitals.

Patients who experienced pressure injury in this study was performed wound cleansing using NaCl solution. Wound cleansing was performed once a day by nurses on morning duty. Wound care performed on patients using sterile technique, the wound looked clean, red and no pus or exudate and no undermining. It is explained that cleaning pressure injury aims to help ease the disposal of dirt and bacteria, water or NaCl commonly used as a cleanser for most pressure injuries (Jordan, 2017). In line with the recommendation of NPUAP & EPUAP (National Pressure Ulcer Advisory Panel & European National Pressure Ulcer Advisory Panel, 2009) that if the patient's
wound has no infection and no suspected infection then the solution used to clean the wound is NaCl. In patients of this study did not perform debridement because the wound had no necrotic tissue.

Wound dressing used by patients in this study was Hydrocolloids. The wound dressing was changed once a day during the morning duty; replacement of bandages was done after the wound was cleaned by using NaCl. The wound dressing is a major component of pressure injury treatment. The wound dressing is used to keep the wound area moist to boost healing and to keep the surrounding skin clean of wound exudates. The choice of wound dressing varies and should be based on the wound condition such as the depth of the wound and the amount of exudate, the aim is achieving clean wound healing with granulation tissue (Pullen & Anhold, 2011).

In general, keeping pressure injury wound remains moist ideal for accelerating healing or wound closure, according to Hunter & Edwards (Hunter & Edwards, 2017) that Hydrocolloids effectively close the wound and retain moisture, promote healing and autolysis, therefore, Hydrocolloids is suitable for pressure injury degree III. It is in line with the recommendation of NPUAP & EPUAP (National Pressure Ulcer Advisory Panel & European National Pressure Ulcer Advisory Panel, 2009) in the Pressure Ulcer Treatment Quick Reference Guide that Hydrocolloids can be used to bandage degree III pressure Injuries with no infection.

CONCLUSION

The result of research and data processing obtained the prevalence of pressure injury amounted to one patient with degree III and was brought from home. Pressure injury preventions mostly performed were pressure injury risk assessment and nutritional support, the least performed preventions were changing position, the use of pillows and health education, and the ones that have never been done were the use of oils, moisturizing creams and pressure air mattresses. The wound treatment of pressure injury patients used NaCl liquid with hydrocolloid bandage.

The recommendations that researchers can provide to the hospital are supports for patients' needs to avoid pressure injury, such as preparing standard operating procedure on pressure injury prevention to facilitate nurses in maximizing intervention to prevent pressure injury, providing the supporting tools for the implementation of preventive action on pressure injury such as pressure air mattress. In addition, preparing leaflet about information on pressure injury prevention, which later becomes a means of conducting health education both to patients and families so that the family is expected to be involved in conducting pressure injury prevention. Suggestion for further research is a research related to pressure injury in community settings and factors related to family participation in preventive measures of pressure injury.

Declaration of Conflicting Interest

None.

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Author Contribution

All authors equally contributed in this study.

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contributing to their development in the OR. AORN Journal, 103(3), 271-281.


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IMPACT OF HEALTH EDUCATION INTERVENTION ON KNOWLEDGE OF CERVICAL CANCER PREVENTION AMONG WOMEN IN BAHOROK’S VILLAGE, NORTH SUMATRA INDONESIA

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Abstract
Background: Cervical cancer is the second cancer disease that attacks women in the world, and it ranked the first in developing countries. It is expected that woman’s knowledge about cervical cancer will prevent the incidence among them.
Objective: To examine the effect of health education on the knowledge level of women about cervical cancer prevention.
Methods: This was a pre-experimental study with one group pretest posttest at Bahorok’s Village, North Sumatra, Indonesia on April to May 2016. There were 36 samples selected using purposive sampling. Paired t-test was used for data analysis.
Results: There was a significant difference in the mean value of women knowledge levels (p=0.004), with the increase of the mean of knowledge before intervention (mean= 1.0) and knowledge after the intervention (mean= 2.14).
Conclusion: There was a significant effect of health education in increasing the level of women knowledge about prevention of cervical cancer. It is suggested that that health education should be done routinely to increase women knowledge in order to prevent cervical cancer.

Keywords: cervical cancer; health education; women; knowledge

INTRODUCTION

The cancer has surpassed heart disease as the top cause of death for Hispanics in the United States, it is even more critical to focus on early detection of cancer in this population (Gebrie, Belete, Lemlem, & Woreta, 2015). Cervical cancer is a malignant tumor growing inside the neck of the uterine/cervix of the lowest part from the uterine that it sticks on the branch the top of the vagina. Cervical cancer usually attacks old lady 35-55 years, which 90% from cervical cancer originating from an squamous that lines the cervix of and 10% the remaining one from the cell in attempting to balance their glands mucus on a tract of cervical region and inside the uterine (Handayani, Suharmiati, & Ayuningtyas, 2012; Priya, 2013). Cervical cancer is a highly prevalent cancer in women all over the world, which causes about 300,000 deaths each year, continues to be the leading cause of death among gynecological malignancies. Although the cervical cytology screening benefits a lot in the early diagnosis and treatments, cervical cancer outcomes vary significantly (Wan et al., 2014).
The problem of cervical cancer started from the presence of a viral infection HPV especially stems from poor behaviors, early sex, and having lots of sex partner. Based on the World Health Organization (WHO), 630 million women get infected cervical cancer and daily lives 600 women in the world ripped through them. Each year has 500,000 new cases of cervical cancer in the world (Soebachman, 2011). In developed countries, the incidence of cervical cancer is about 4% of all cancer incidences in women, while in developing countries, for example in South Asia and Southeast Asia reaches above 15 %. The numbers of the incidence of cervical cancer in Latin America and sub-Saharan Africa are the same with its numbers in Asia, estimated incidence of cervical cancer in the Philippines (age-standardized rate (ASR: 20.9 per 100,000), Thailand (ASR: 19.8) and Vietnam (the ASR: 20.2) (Emilia, Kusumanto, Hananda, & Freitag, 2010).

According to the data of Indonesia Cancer Foundation, the prevalence of woman with cervical cancer in Indonesia is considered to be high, every day found 40 - 45 new cases with the number of deaths of 20 - 25 people. The number of women at risk of cancer uterine is 48 million people. Therefore, Indonesia is considered as a country with the highest incident cervical cancer in the world, with the odds 66 % of mortality (Halimatusyaadiah, 2016).

METHODS

Study design
The design used in this study was a pre-experimental study with pretest-posttest without control group to determine the influence of health education on the level of women knowledge about prevention of cervical cancer. This research was conducted at Bahorok’s Village North Sumatra Indonesia during 2 months between April and May 2016.

Sample
The population is the whole object of study or the object under study (Notoatmodjo, 2014).

The population in this study was all women who lived in the Village of Bahorok Village as many as 120 people. There were thirty-six samples were selected by using the purposive sampling techniques. The inclusion criteria were the women lived at Bahorok Village aged 35–55 years, had good verbal communication, conscious, married, had been willing to be respondents and understood Indonesian language.

Intervention
Health education was done at the Office of the Principal of Bahorok Village. The health education was performed for 25 minutes by the researcher by explaining about cervical cancer definition, signs and symptoms, causes, risk factors, prevention and suggestion for early detection. The media used were pictures and brochure containing about that information.

Instrument
The questionnaire used in this study is designed by Nursanti to measure of the women’s knowledge about the prevention of cervical cancer. The validity and reliability test of the instrument have been examined by previous researchers in Indonesian language (Nursanti, 2014). The questionnaire is divided into parts, namely the identity of the respondents and question consisting of 20 statements using multiple-choice question with total scores (20). The scores of respondents are converted into the three category: good (16 – 20), enough (12 – 15) and less (≤11) (Notoatmodjo, 2014).

Ethical consideration
Ethical approval of this research was obtained from The Research Ethics Commission of Nursing Faculty of North Sumatra University, with approval number: 1291/II/SP/2016. Each participant signed informed consent prior to data collection.

Data analysis
To determine the influence of health education on the levels of knowledge among women, Paired t-test was used.
RESULTS

Before intervention, the majority of respondents had less knowledge (22.2%) and enough knowledge (77.78%) about cervical cancer prevention, and after given intervention there was an increase of knowledge to good category (91.7%) in each group of age (See Table 1).

Table 1 Frequency distribution of the knowledge level of woman about cervical cancer prevention before and after given health education of cervical cancer prevention based on age (N=36)

<table>
<thead>
<tr>
<th>Age</th>
<th>Knowledge (Before)</th>
<th>Total</th>
<th>Knowledge (After)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good f %</td>
<td>Enough f %</td>
<td>Less f</td>
<td></td>
</tr>
<tr>
<td>35-40</td>
<td>0 0</td>
<td>13 76.47</td>
<td>4 23.5</td>
<td>17 100</td>
</tr>
<tr>
<td>41-45</td>
<td>0 0</td>
<td>8 80</td>
<td>2 20</td>
<td>10 100</td>
</tr>
<tr>
<td>46-50</td>
<td>0 0</td>
<td>6 75</td>
<td>2 25</td>
<td>8 100</td>
</tr>
<tr>
<td>51-55</td>
<td>0 0</td>
<td>1 100</td>
<td>0 0</td>
<td>1 100</td>
</tr>
<tr>
<td>Total</td>
<td>0 0</td>
<td>28 77.78</td>
<td>8 22.2</td>
<td>36 100</td>
</tr>
</tbody>
</table>

Table 2 Frequency distribution of the knowledge level of woman about cervical cancer prevention before and after given health education of cervical cancer prevention based on educational level (N=36)

<table>
<thead>
<tr>
<th>Education</th>
<th>Knowledge (Before)</th>
<th>Total</th>
<th>Knowledge (After)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good f %</td>
<td>Enough f %</td>
<td>Less f</td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>0 0</td>
<td>1 100</td>
<td>0 0</td>
<td>1 100</td>
</tr>
<tr>
<td>Secondary</td>
<td>0 0</td>
<td>3 75</td>
<td>1 25</td>
<td>4 100</td>
</tr>
<tr>
<td>High</td>
<td>0 0</td>
<td>9 90</td>
<td>1 10</td>
<td>10 100</td>
</tr>
<tr>
<td>D3</td>
<td>0 0</td>
<td>13 72.2</td>
<td>5 27.7</td>
<td>18 100</td>
</tr>
<tr>
<td>Bachelor</td>
<td>0 0</td>
<td>2 66.6</td>
<td>1 33.3</td>
<td>3 100</td>
</tr>
<tr>
<td>Total</td>
<td>0 0</td>
<td>28 77.78</td>
<td>8 22.2</td>
<td>36 100</td>
</tr>
</tbody>
</table>

Based on table 2, of 36 participants, 28 (77.78%) had enough knowledge and 8 (22.22%) had less knowledge about cervical cervix prevention before intervention, while after given intervention the majority of participants (91.7%) had good knowledge about the prevention of cervical cervix.

Table 3 The influence of health education on the level of knowledge in women about cervical cancer prevention using Paired t-test (N=36)

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Mean</th>
<th>N</th>
<th>SD</th>
<th>DF</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>1.00</td>
<td>36</td>
<td>0.00</td>
<td>35</td>
<td>0.004</td>
</tr>
<tr>
<td>After</td>
<td>2.14</td>
<td>36</td>
<td>0.48</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that the mean level of knowledge of women on the prevention of cervical cancer before given the health education was 1.00, with standard deviation of 0.00, while after the health education the mean value of knowledge increased to 2.14, with standard deviation of 0.48. Paired t-test showed p value = 0.004, which indicated that there was a significant effect of health education on the level of knowledge of women about cervical cancer prevention.

DISCUSSION

The aim of this study was to examine the effect of the health education on the level of women knowledge about prevention of...
cervical cancer. Findings of this study revealed that there was a significant increase of knowledge level after intervention (p<0.05).

This study provides the insight of knowledge that health education using brochure is still effective to increase the knowledge of women in preventing cervical cancer, particularly in North Sumatra Indonesia, although we are living in the digital era today. In fact, it is not about the media we use, but how we actually deliver the information is the key.

In addition, seen from the age and education of the respondents, this study indicated that the use of media in health education increased each group of respondents as well as each educational group. This contradicts the previous study (Wawan & Dewi, 2010) stated that age is an important thing in influencing knowledge. The increasing age will also change the physical and psychological aspects of the person, which is in terms of the psychological aspects; the level of thinking of someone will be more mature and adult.

It is also in contrast with another study (Supardi, 2013) mentioned that the higher the education a person has, the more easily he/she receives information, and ultimately knowledge will be increased. On the contrary, if a person has a low level of education, it will inhibit the development of attitude of the person towards acceptance of the information and new values. In fact, in this study, there is no problem with the educational background of someone has, but it is about how they receive the information from the health education.

Findings of this study are in line with previous studies indicated that there was an increase of knowledge about the care of patients with asthma after health education (Winangsit, Maliya, & Sahuri Teguh, 2014), supported by another study stated that there was an increase of teacher's knowledge about cervical cancer screening after health education (R. E. Chinwe & U. R. Abigail, 2015). The age restriction on respondents at this research, seen from the incidence of cervical cancer, the majority happened to age 35 - 55 years and also the education of respondent is elementary – bachelor only. Some of the results of previous study (Ilter et al., 2010) stated that women after health education on the benefits of the HPV vaccine in Turkey, their level of knowledge was better, similar with another study (E. R. Chinwe & U. R. Abigail, 2015) on the influence of health education on knowledge, attitude and practice of cervical cancer screening among secondary school teachers in the State of Enugu, which revealed that there was a significant change in knowledge of the teachers. Thus, the presence of health education can transform one's knowledge into a better direction (Ashtarian, Mirzabeigi, Mahmoodi, & Khezeli, 2017).

Limitation of the study

As this study only involved one group pretest-posttest only, thus further study is needed to compare the effect of health education between experiment and control group to better understanding of the results of the impact of the health education applied in this study.

CONCLUSION

There was a significant impact of health education to increase of women knowledge about prevention of cervical cancer at Bahaorok Village. Therefore, it is suggested that health education using brochure can be used to increase women knowledge about prevention of cervical cancer, both in private and government hospitals.

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Declaration of Conflicting Interest
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Author Contribution
This is the original study of the corresponding author.
References


INCREASING SELF-EFFICACY TO REGULATE EXERCISE IN ADULT PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Abstract
Background: Self-efficacy has been described as a dominant factor associated with physical exercise in adult patients with type 2 diabetes mellitus, but to improve self-efficacy to regulate exercise of adult patients with type 2 diabetes mellitus is a challenge for health workers.

Objective: This study was to determine the effect of exercise consultation program on self-efficacy to regulate exercise in adult patients with type 2 diabetes mellitus.

Methods: A quasi-experimental study with two comparison groups was purposively designed for pre-test and post-test procedures. Sixty-one patients of type 2 diabetes mellitus were allocated into the experimental group (31 patients) and the control group (29 patients). While the experimental group received the exercise consultation for 12 weeks and routine care, the control group received routine care only. Comparative assessments on differences in self-efficacy to regulate exercise were examined both within and between groups using paired or unpaired t-test.

Results: After receiving exercise consultation program, self-efficacy to regulate exercise significantly increased within the experimental group (p < .05), but there was no significant change with in the control group. Between groups, there was a significant difference self-efficacy to regulate exercise in adult patients with type 2 diabetes mellitus (p < .05).

Conclusion: The exercise consultation program could increase self-efficacy to promote the physical exercise among adult patients with type 2 diabetes mellitus.

Keywords: transtheoretical model; self-efficacy; physical exercise; type 2 diabetes mellitus

INTRODUCTION

Physical exercise is one of essential diabetes management strategies for type 2 diabetes mellitus (T2DM) (Colberg et al., 2010; Sigal, Kenny, Wasserman, Castaneda-Sceppa, & White, 2006), but it is very difficult to maintain performing exercise in everyday ( Morrato, Hill, Wyatt, Ghushchyan, & Sullivan, 2007). Self-efficacy is strongest predictor of physical exercise (Plotnikoff, Trinh, Courneya, Karunamuni, & Sigal, 2011).
Webster, 2010; Plotnikoff et al., 2011). The exercise consultation has been developed on the basis of physical activity counseling guided by the TTM and cognitive behavioral approach (Dalle Grave, Calugi, Centis, El Ghoch, & Marchesini, 2010; Kirk et al., 2010). However, it has never been used in Indonesia. Using the exercise consultation for physical exercise with Diabetes Exercise based on TTM approach is first study in Indonesia. The majority of people with T2DM living in Medan (73%), North Sumatera, Indonesia did not participate in diabetes exercise (Sinaga & Hiswani, 2012). Regard to increase of patients with T2DM in Indonesia (Pramono et al., 2010; Wild, Roglic, Green, Sicree, & King, 2004) especially in Medan (Sinaga & Hiswani, 2012), North Sumatera province, the researchers were interested in improving the physical exercise behavior of Indonesians with T2DM through exercise consultation. Diabetes Exercise integrated in exercise consultation would promote changes in physical activity behaviors. This study was to examine the effect of exercise consultation program on changes of exercise behavior, self-efficacy and health outcome blood glucose and body mass index among people with T2DM. This knowledge would be better applying the exercise consultation program for improving exercise behavior and self-efficacy among people with T2DM at the Community Health Centre, in Medan, Indonesia.

METHODS

Study design
A quasi-experimental was utilized in this study, with pre-test and post-test comparison group design. The purpose of this study was to determine the effect of exercise consultation program on self-efficacy to regulate exercise adults’ patients of type 2 diabetes mellitus.

Sample and setting
All 66 participants were recruited from Darussalam Public Health Center with purposive sampling. Participants who were met the criteria inclusion were type 2 aged between 40 to 59 years, blood glucose level ranging from 140 to 250 mg/dl as per physical check-up at Public Health Center, were in the stages of preparation of Transtheoretical Model stage of change (e.g., they did not meeting current physical exercise guidelines, but intended to become more active). Diabetic with severe cardiovascular problems and other serious complications of diabetes (e.g. going blind, marked neuropathy, osteoporosis, or impending renal failure) were excluded. The participants were randomly assigned into two groups of the experimental group and the control group consisting of 33 subjects each. Six diabetic patients were withdrawal due to personal reasons from the study, two of the experimental group and three of the control group. Only 60 participants remained in the study, 31 of the experimental group completed the 12-week exercise consultation program adding to usual care and 29 participants received usual care.

Intervention
The exercise consultation program involving one-by-one discussion guideline (Kirk et al., 2010; Loughlan & Mutrie, 1996; Prochaska & Velicer, 1997) has been adopted for use in this study with certain modifications to meet the goals of motivating and enhancing confidence to change. Participants were able to take the important first step to ensure the plan for a programmed exercise, while the consulting practices have focused on promoting increase in physical exercise, as for example, Diabetes aerobic. The exercise consultative session adhered to the strategies of Part 1 and Part 2. For part 1, it starts with discussing or assessing the participant’s current physical exercise activity, followed by identifying benefits and hopes to obtain benefits from physical exercise, perceived social support and the mental barriers to exercise, then move onto making commitment to exercise. Finally, at the end of each exercise consultation, the principal researcher summarized of discussions and solutions to any foreseeable problems for individual participant. The logical solution of problem is 1) to discuss/explore the benefits of becoming more active in doing physical exercise, 2) to give clear advice how to begin a diabetes aerobic program, 3) to make...
recommendation to people with type 2 diabetes for physical exercise which includes frequency, duration and intensity of physical exercise.

For part 2, making demonstration of diabetes aerobic procedures stage by stage with the help of booklet/leaflet and VCD, the booklet/leaflet referred to diabetes aerobic 5 series developed by Indonesian Diabetes Association (Santoso, 2010), whose contents cover essential information about the postures and steps of Diabetes aerobic movements. Guidelines for doing Diabetes aerobic for type 2 diabetes started with warm-up (5 to 10 minutes), followed by core movement (20 minutes) and final cool-down (5 to 10 minutes). Participants with T2DM should do this Diabetes aerobic regularly making gradual progress. While the VCD referred to Diabetes aerobic 5 series” developed by Indonesian Diabetes Association (Santoso, 2010).

Instrument
Self-efficacy towards regular exercise was assessed by using the five items of the ESQ (Marcus, Selby, Niaura, & Rossi, 1992). The item response is identifying the level of confidence of carrying out certain behaviors with numerical rating from '0' (not applicable) to '10' (very confident). Internal consistency reliability was 0.82 and test-retest reliability was 0.90 (Ferguson, 1997). The sum score of self-efficacies of exercise varies from 0 to 50, the higher score implies a higher level of self-efficacy towards regular exercise.

Blood glucose refers to the level of glucose in the blood of the patients with T2DM. Blood glucose level was measured in the morning before breakfast (Fasting Blood Sugar or FBS) as well as being measured before and after the programmed intervention. All blood samples were taken from finger peripheral blood. Fasting implies that absolutely no food intake eight hours prior to BGT. Blood Glucose Tests were administered on patients using biochemical analyzer - Blood Glucose Test Meter One Touch BASIC Plus Life Scan 2000 (Manufactured by Standard Prodia Laboratory).

Ethical consideration
Prior to collecting data, the Ethic Review Committee for Research Involving Human Research Subject, Universitas Sari Mutiara Indonesia has approved the study and written informed consent was obtained from all participants.

Data analysis
Saphiro Wilk test was used to check the normal distribution of the self-efficacy and blog glucose, and the data were normal distributed. The mean differences of self-efficacy, blood glucose both pre- and post-intervention within the same group were examined using dependent t-test. The mean differences between the two groups were examined by using the independent t-test at significant level of .05.

RESULTS
The mean age of the participants was 54.45 years (SD= 5.29) for the experimental group and 54.46 years (SD= 4.42) for the control group. Majority of the participants were female in both groups. The average blood glucose levels were 207.52 mg/dl (SD=27.68) in the experimental group and 207.70 mg/dl (SD=15.31) in the control group. The participants in the experimental group (68%) and control group were in the preparation stage of change (60 %).

At the baseline, there was no significantly different mean score of self-efficacy between the two groups. In Table 1, the mean score of self-efficacy to regulate exercise, post-intervention of exercise consultation program, among the experimental and the control group was 38.13 (SD = 5.29) and 25.27 (SD = 6.74), respectively. Self-efficacy for those participated in the exercise consultation program was higher over those who did not participate. The independent t-test was significant difference for self-efficacy towards regulate exercise in the experimental group when compared to the control group (t= 8.305, p < .05).
Table 1 Comparison of mean score of Self-efficacy and blood glucose in subjects between the experimental (n=31) and control (n=29) groups using Independent t-test

<table>
<thead>
<tr>
<th></th>
<th>Experimental group</th>
<th>Control group</th>
<th>t</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre intervention</td>
<td>23.94 (5.72)</td>
<td>25.10 (5.75)</td>
<td>-0.792</td>
<td>0.431</td>
</tr>
<tr>
<td>Post intervention</td>
<td>38.13 (5.29)</td>
<td>25.27 (6.74)</td>
<td>8.305</td>
<td>0.000</td>
</tr>
<tr>
<td>Blood Glucose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre intervention</td>
<td>207.52 (27.68)</td>
<td>207.70 (15.31)</td>
<td>-9.74</td>
<td>0.338</td>
</tr>
<tr>
<td>Post intervention</td>
<td>23.20 (2.97)</td>
<td>24.92 (1.58)</td>
<td>10.199</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Mean scores of blood glucose levels (Table 1), post-intervention of exercise consultation was 171.94 (SD = 30.86) and 213.53 (42.73) for the experimental and the control group respectively. This result showed that blood glucose levels of participants participated in an exercise consultation program was lower than those who did not. The result of independent t-test obtained has also confirmed the significant differences of blood glucose levels between participants in the experimental group and those in the control group (t = 10.199, p < .05).

DISCUSSION

This study has been undertaken with the primary aim of assessing the effects of conducting exercise consultation program to influence self-efficacy to regulate exercise among patients of T2DM, by comparing two groups - one designated as the experimental group receiving exercise consultation program and the other designated as the control group receiving usual care. The exercise consultation might motivate subjects to become more physically active and increase self-efficacy and awareness of the benefits of physical exercise, thereby lowering mental barriers to exercise. Limited motivation and exercise knowledge could be barriers to taking up regular exercise among adults with T2DM (Korkiakangas, Alahuhta, & Laitinen, 2009). Therefore, the exercise consultation should aim to support and motivate patients taking up exercise, as well as helping patients to recognize their unhealthy behaviors. Enhancing patient’s motivation and educating patients about the benefit of exercise are the most successful strategies for patients to engage the exercise (Kirk et al., 2010). High levels of physical exercise have correlation with patients progressed their stage of change (Kirk et al., 2010), and it would be good if they could maintain their exercise behavior changes (Jackson et al., 2007; Kirk et al., 2010). It is clear that exercise consultation program increases the participant’s self-efficacy to exercise regularly.

Self-efficacy is an important factor of progressing individuals from the lower stages to upper stages through behavioral changes (Burbank & Riebe, 2001; Lenio, 2006) like the instance of individuals moving from the contemplation or preparation stages to the 'Action' stage. Individuals in the contemplation or preparation stages may struggle to change due to lack of exercise knowledge (Lenio, 2006) and lack of self-confidence in his or her ability to change. Individuals are able to move to the next stage of change whenever being comfortable with the selected exercise plan which is practical to follow. Therefore, for individuals in preparation stages their self-efficacies need to be enhanced. Previous study (Allen, Fain, Braun, & Chipkin, 2008) found that individuals with higher self-efficacies had shown more confidences in maintaining their physical activity program. In addition, self-efficacy has proven to be the strongest predictor for maintaining regular exercise behavior amongst adults of type 2 diabetes (Plotnikoff et al., 2011).

Controlling blood glucose level might be improved by doing diabetes aerobic for at least

30 minutes each session 3 times a week in a short period of 12 weeks. The findings in this study had shown that blood glucose levels became lowered amongst participants participated in regular diabetes exercise. These findings were consistent with several previous studies which highlighted that a 4-6 weeks of performing diabetes aerobic for 30 minutes each session 3 times a week had significantly reduced blood glucose levels (Indriyani, Supriyatno, & Santoso, 2010; Mawarti & Sricahyuniati, 2005; Unairawati & Soetjiatie, 2011; Utomo, Azam, & Ningrum, 2012). Physical exercise undertaken by patients of T2DM can lead to increased glucose utilization because of active muscles movement and lowered blood glucose levels (Colberg et al., 2010).

This study may have some limitations that some factors were not measured in this study. Individual physical environment that may be the barrier in attending diabetes exercise program and may influence the results was not measured such as distance between home and community health center. In addition, Emotions and mood may affect differences in diabetes control but it is not measured in this study. Secondly, decrease blood glucose levels after exercise was higher than the recommended by American Diabetes Association (ADA) guideline. The possible factors would be several caused by: 1) Amount of food intake and exercise intensity was not in balance. 2) Difference in individual’s metabolic rate. 3) Culture of eating behaviors such as kind of food in most common in person in Indonesia all are high carbohydrate. And 4) may be related to exercise intensity and duration of exercise. However, assessment of the food intake, individual’s metabolic rate, culture of eating behavior and exercise intensity of the participants was not performed in this study. In addition, participant’s emotions and mood may also affect diabetic controls, but these mental factors are outside the scope of this study. Records of participant’s personal preference on diet and their medication discipline were not included in this study either. These aforementioned factors could well be accountable for the differences in blood glucose levels. Other possible limitations related to variables were not measured including A1C, lipid, blood pressure, and quality of life as well as small sample size. For the future research, the exercise consultation program should be studied with longer follow-up period to measure these objectives and to evaluate the maintenance of physical exercise behavior change in a large sample size of patients of T2DM under different setting in Indonesia.

CONCLUSION

Exercise consultation program could improve self-efficacy to regulate exercise and health outcome on blood glucose in patients of T2DM. This program is a feasible to encourage sedentary people with type 2 diabetes to perform physical exercise. Health care providers consider using this program for life style modification to be better diabetes control and prevent diabetes complication.

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Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

References


FATIGUE AND WORK SATISFACTION OF EMERGENCY NURSES IN BANDUNG, WEST JAVA, INDONESIA

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Abstract
Background: Emergency nurses are required to always carry out their roles in a variety of situations and conditions. Nursing services in the emergency unit must be done quickly and accurately. Data showed that the number of patient visits in the Emergency Unit of Hasan Sadikin Hospital in August 2017 was 3,059 (73% of patients with category III) with an average visit of 99 people per day. This causes overcrowding in the emergency unit, which lead to fatigue and influence work satisfaction.
Aim: The aim of this study was to determine fatigue and job satisfaction of emergency nurses in Hasan Sadikin Hospital in Bandung, West Java, Indonesia.
Methods: This was a quantitative descriptive study, which involved 55 respondents. Fatigue was measured using Individual Strength Checklist Instrument of 20-self reported questionnaire (CIS20R), and job satisfaction was measured using McClorskey / Mueller Satisfaction Scale (MMSS).
Results: The mean value of work fatigue was 3.4 with the highest value at the sub variable of physical activity. In general, the mean value of nurse work satisfaction was 2.66.
Conclusion: Emergency nurses in the emergency unit of Hasan Sadikin hospital has high level of fatigue and low work satisfaction. The hospital management is suggested to provide better work schedule for better interaction among nurses, provide opportunities for all staff to be involved in research or other scientific work, and schedule family gatherings regularly to improve togetherness between staff and their families.

Keywords: emergency department; fatigue; job satisfaction; emergency nurses

INTRODUCTION

Emergency Department (ED) is a leading hospital service unit that provides first service to patients with death and disability, threats in an integrated manner and involves various levels of profession (Ministry of Health, 2009). The increase in various diseases including infectious diseases, acute degenerative diseases, traffic accidents, work accidents and disasters, as well as other events will have an impact on the increasing needs (demand) of hospital services, one of which is emergency room service (Paul, Reddy, & DeFlitch, 2010). The increase in ED services will have a negative impact if it is not anticipated properly. Study said that the phenomenon of overcrowding is caused by an
imbalance between supply and demand (Asplin et al., 2003). And factors that influence overcrowding in the ED are human factors, infrastructure, procedures and environment (Paul et al., 2010).

Overcrowding has an impact on the high workload, staff fatigue, patient anxiety, medical error, inefficiency, neglect of patient safety and stunted service (The College of Emergency Medicine 2014). Overcrowding in ED can also result in reduced efficiency and quality of care services (Forero, McCarthy, & Hillman, 2011). Overcrowding is directly proportional to the high workload and has an impact on performance degradation. Emergency nurses are required to always carry out their roles in a variety of situations and conditions that include professional patient rescue measures, especially handling emergency patients.

Nursing services in the ED must be done quickly and accurately. Nurses should have adequate experience and knowledge because they must be skilled in assessment and must be able to cope with complex and stressful situations so that it requires professional maturity to tolerate the stresses that occur in making decisions related to the acute condition of the patient and facing the patient's family (Elliott, Aitken, & Chaboyer, 2011). However, the condition of overcrowding in the ED makes the nurses do not have enough time to rest and leads to fatigue.

Fatigue is a condition of a nurse whose energy is depleted due to excessive saturation of the work itself, it occurs due to a lack of rest time from the nurse (Ritonga, 2016). Fatigue is also defined as a feeling of excessive stress, fatigue / exhaustion, and burnout quickly and continuously that occur in the work environment (Brown, 2016). Fatigue conditions can cause changes in performance and appearance, and also influence the process of interaction with family, colleagues and the environment. Continuous fatigue can cause high rates of morbidity and failure in work (Beurskens et al., 2000). Signs and symptoms of a person experiencing fatigue are divided into 3 categories (Hendy, 2016), namely: (1) mild symptoms include weakness (weakness), fatigue, and headache; (2) moderate symptoms include anxiety, loss of appetite, insomnia, and decreased work performance, and (3) severe symptoms include loss of patience, lack of concentration, and lack of empathy.

In addition to fatigue, overcrowding also has the potential to the working stress of emergency nurses. According to literature, one of the causes of work stress is excessive workload (Hariyono, Suryani, & Wulandari, 2012). Job stress also not only has a negative effect on physical and emotional health, but also affects the high turnover and increased absence of work (Brown, 2016). The working environment does not only affect stress, but decrease job satisfaction and increase turnover rates (Brown, 2016). In addition, study stated that there is a significant relationship between fatigue and job satisfaction with medication errors. The effects of work fatigue can have an impact on the quality of the nurse's service quality to the patient (Bolandianbafghi, Salimi, Rassouli, Faraji, & Sarebanhassanabadi, 2017).

Job satisfaction refers to how much someone likes his job (Brown, 2016). Job satisfaction involves psychological and multidimensional aspects such as cognitive, affective, and behavioral components (Brown, 2016). Nurse job satisfaction is one of the most important factors in determining an individual's intention to stay or leave a health care organization (Caricati et al., 2014).

Hasan Sadikin Hospital is a type A hospital, which is a referral center hospital in West Java and also as a teaching hospital with 3000 employees, 395 specialist doctors and subspecialists. The data showed that the number of patient visits in ED in August 2017 was 3,059 (73% of patients with category III) with an average visit of 99 people per day. This causes overcrowding in the ED. Emergency nurses at Hasan Sadikin hospital underwent various roles as patient nurses and as a receptor for nursing students. In addition, the patient's condition is crowded and internal
conflicts with other professions cause a high workload, stress, and have an impact on fatigue and job satisfaction.

As there is a lack of information regarding fatigue and job satisfaction level in ED, this study aimed to identify the fatigue and job satisfaction of emergency nurses at the Emergency Department of Hasan Sadikin Hospital Bandung.

METHODS

Study design
This was a quantitative descriptive study at Hasan Sadikin Hospital, Bandung from 13 April 2018 to 13 May 2018 with 55 emergency nurses selected using total sampling.

Instrument
The Individual Strength Checklist with 20 self-reported questionnaires (CIS20R) was used to measure fatigue, which consisted of four domains: (1) complaints of fatigue, (2) ability to concentrate at work, (3) work motivation, and (4) daily physical activities daily. The instrument used a Likert scale consisting of 20 questions with a score range of 1 – 7 (Schlesiger, 2015). The instrument has been translated into Indonesian language with validity value of ≥ 0.6319 and Cronbach's alpha reliability value of 0.950.

Nurse job satisfaction was measured using McCloskey/ Mueller Satisfaction Scale (MMSS) (Tourangeau, Hall, Doran, & Petch, 2006). The MMSS consists of eight domains: (1) Family / work balance, (2) Extrinsic award, (3) Scheduling satisfaction, (4) Professional opportunities, (5) Control/ responsibilities, (6) Praise/recognition, (7) Co-workers, and (8) Interaction. The instrument format uses a Likert scale consisting of 31 questions with a score range of 1 – 5. The instrument has been translated into Indonesian language with Cronbach's alpha reliability value of 0.969.

Statistical analysis
Data that have been entered into the frequency distribution table were tested for normality. Kolmogorov Smirnov test showed that the data were normally distributed, both for satisfaction variables (Z scores ≥ 1.357) and for fatigue variables (Z scores 1 1.110). Therefore, the analysis in categorizing fatigue and satisfaction used the mean value. For fatigue, the higher the mean value, the higher the level of fatigue, and the lower the mean value, the lower the level of fatigue. For satisfaction, the higher the mean value, the more satisfied respondents are, and the lower the mean value, the more dissatisfied the respondents are.

Ethical consideration
Ethical approval was obtained from the Hasan Sadikin Hospital (Reference No. LB.02.01/X.2.2.2/6795/2018) and the Faculty of Nursing, Universitas Padjadjaran Ethics Committee (No. 1030/ UN6.L1/ KM/ 2018). Informed consent has been done in each respondent to tell about the objective and procedure of the study.

RESULTS

Based on Table 1, it shows that more than half of respondents aged 36-45 years old, had a diploma education, had a service life of >10 years, and worked as civil servants. Majority of respondents were female, and almost all respondents were married.

Table 2 shows that the mean value of work fatigue was 3.4. The highest mean value in terms of the highest level of fatigue was in the sub variable of physical activity, followed by sub variables of concentration and subjective feeling of fatigue; while the lowest mean value was in the sub variable of motivation. While seen from the results of the mean per item statement in the domain in the Table 3, the highest mean values in the item statement were "I don't do a lot of things throughout the day" (5.22), "I can concentrate well" (5.1), and "I feel I can rest" (4.9).
Table 1 Distribution of Respondent Characteristics at ED Hasan Sadikin Hospital Bandung (n = 55)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>f</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
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<tr>
<td>26-35</td>
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<td>36-45</td>
<td>31</td>
<td>56.36</td>
</tr>
<tr>
<td>46-65</td>
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<td>1.82</td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
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</tr>
<tr>
<td>Female</td>
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</tr>
<tr>
<td>Education</td>
<td></td>
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</tr>
<tr>
<td>D III</td>
<td>36</td>
<td>65.45</td>
</tr>
<tr>
<td>S 1</td>
<td>18</td>
<td>32.73</td>
</tr>
<tr>
<td>S 2</td>
<td>1</td>
<td>1.82</td>
</tr>
<tr>
<td>Year of services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5 year</td>
<td>2</td>
<td>3.64</td>
</tr>
<tr>
<td>5-10 year</td>
<td>15</td>
<td>27.27</td>
</tr>
<tr>
<td>&gt;10 year</td>
<td>38</td>
<td>69.09</td>
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<tr>
<td>Marriage</td>
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<td></td>
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<tr>
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<td>49</td>
<td>89.09</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>10.91</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Civil servants</td>
<td>36</td>
<td>65.45</td>
</tr>
<tr>
<td>Non- civil servants</td>
<td>19</td>
<td>34.55</td>
</tr>
</tbody>
</table>

Table 2 Fatigue in Nurses in the Emergency Department of Hasan Sadikin Hospital Bandung (n = 55)

<table>
<thead>
<tr>
<th>Fatigue and its sub variables</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>3.4</td>
<td>0.79</td>
<td>1.7</td>
<td>5.15</td>
</tr>
<tr>
<td>Physical activity</td>
<td>4.34</td>
<td>1.22</td>
<td>1.33</td>
<td>7</td>
</tr>
<tr>
<td>Concentration</td>
<td>3.65</td>
<td>0.98</td>
<td>1.4</td>
<td>6.2</td>
</tr>
<tr>
<td>Subjective feeling of fatigue</td>
<td>3.12</td>
<td>0.74</td>
<td>1.75</td>
<td>5</td>
</tr>
<tr>
<td>Motivation</td>
<td>2.91</td>
<td>0.84</td>
<td>1.25</td>
<td>4.5</td>
</tr>
</tbody>
</table>

On the other hand, Table 4 shows that, in general, the mean value on nurse job satisfaction (score range 1-5) was 2.66. The lowest mean value in terms of having a low level of satisfaction was in the family / work balance, followed by sub variables of extrinsic rewards, scheduling satisfaction, professional opportunities, control / responsibility, reinforcement, and team. The highest mean value was interaction, in the sense that respondents feel satisfied in sub variable interactions.

The results of the mean per item statement of job satisfaction in Table 5 show that the lowest mean value was "weekend holidays every month" (1.75), "childcare facilities" (1.75), and "holidays" (1.75). And the highest mean value of job satisfaction seen from statement items were "nurse colleagues (in working relationships)" (3.47), "recognition of your work from colleagues" (3.29), and "opportunities for social contact at work" (3.24).

Researchers in this study also conducted cross tabulations between the number of respondents with satisfaction and fatigue (see Table 6). The results show that the highest numbers of respondents are those with low level of fatigue and satisfaction, while the lowest were respondents who had low level of fatigue but were dissatisfied.
### Table 3 Fatigue in Nurses Based on Mean Statement Items (n = 55)

<table>
<thead>
<tr>
<th>Item</th>
<th>Statement</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity</td>
<td>I don't do a lot of things throughout the day</td>
<td>5.22</td>
</tr>
<tr>
<td></td>
<td>I do enough things in a day</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I have low output at work</td>
<td>3.8</td>
</tr>
<tr>
<td>Concentration</td>
<td>I can concentrate well</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Thinking requires effort</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>I have problems concentrating</td>
<td>3.47</td>
</tr>
<tr>
<td></td>
<td>When I do something, I can concentrate quite well</td>
<td>3.45</td>
</tr>
<tr>
<td></td>
<td>My mind easily becomes not concentrated</td>
<td>2.5</td>
</tr>
<tr>
<td>Subjective feeling of fatigue</td>
<td>I can concentrate well</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Thinking requires effort</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>I have problems concentrating</td>
<td>3.47</td>
</tr>
<tr>
<td></td>
<td>When I do something, I can concentrate quite well</td>
<td>3.45</td>
</tr>
<tr>
<td></td>
<td>My mind easily becomes not concentrated</td>
<td>2.5</td>
</tr>
<tr>
<td>Motivation</td>
<td>I feel very active</td>
<td>2.98</td>
</tr>
<tr>
<td></td>
<td>I feel there is no desire to do anything</td>
<td>2.93</td>
</tr>
<tr>
<td></td>
<td>I feel like doing all kinds of work well</td>
<td>2.87</td>
</tr>
<tr>
<td></td>
<td>I am full of plans</td>
<td>2.87</td>
</tr>
</tbody>
</table>

### Table 4 Nurse Job Satisfaction (n = 55)

<table>
<thead>
<tr>
<th>Job satisfaction</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job satisfaction</td>
<td>2.66</td>
<td>0.58</td>
<td>1.38</td>
<td>3.77</td>
</tr>
<tr>
<td>Family / work balance</td>
<td>2.14</td>
<td>0.68</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>Extrinsic award</td>
<td>2.35</td>
<td>0.95</td>
<td>1</td>
<td>4.33</td>
</tr>
<tr>
<td>Scheduling satisfaction</td>
<td>2.37</td>
<td>0.67</td>
<td>1</td>
<td>3.75</td>
</tr>
<tr>
<td>Professional opportunities</td>
<td>2.68</td>
<td>0.70</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Control/ responsibilities</td>
<td>2.85</td>
<td>0.83</td>
<td>1</td>
<td>4.25</td>
</tr>
<tr>
<td>Praise/recognition</td>
<td>3.00</td>
<td>0.83</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>Co-workers</td>
<td>3.10</td>
<td>0.68</td>
<td>1</td>
<td>4.33</td>
</tr>
<tr>
<td>Interaction</td>
<td>3.11</td>
<td>0.77</td>
<td>1</td>
<td>4.5</td>
</tr>
</tbody>
</table>

### Table 5 Nurse Job Satisfaction based on statement mean items (n = 55)

<table>
<thead>
<tr>
<th>Item</th>
<th>Statement</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family / work balance</td>
<td>Holidays on weekends every month</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>Childcare facilities</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>Compensation for work on weekends</td>
<td>1.89</td>
</tr>
<tr>
<td></td>
<td>Flexibility in scheduling weekend breaks</td>
<td>2.04</td>
</tr>
<tr>
<td></td>
<td>Maternity leave time</td>
<td>3.27</td>
</tr>
<tr>
<td>Extrinsic award</td>
<td>Holidays (Holiday program from the hospital)</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>Salary (income received in 1 month)</td>
<td>2.58</td>
</tr>
<tr>
<td></td>
<td>Other benefits (insurance, retirement)</td>
<td>2.71</td>
</tr>
<tr>
<td>Scheduling satisfaction</td>
<td>Opportunity to work part time (elsewhere)</td>
<td>2.02</td>
</tr>
<tr>
<td></td>
<td>Opportunities to work in a day without a break</td>
<td>2.35</td>
</tr>
<tr>
<td></td>
<td>Flexibility in scheduling your working hours</td>
<td>2.45</td>
</tr>
<tr>
<td></td>
<td>Number of hours you work</td>
<td>2.65</td>
</tr>
</tbody>
</table>
Professional opportunities

<table>
<thead>
<tr>
<th>Professional opportunities</th>
<th>2.68</th>
</tr>
</thead>
<tbody>
<tr>
<td>23 Opportunities for career development</td>
<td></td>
</tr>
<tr>
<td>21 The opportunity to become a department and institutional committee</td>
<td>2.51</td>
</tr>
<tr>
<td>28 Opportunity to write and publish</td>
<td>2.51</td>
</tr>
<tr>
<td>27 Opportunity to participate in nursing research</td>
<td>2.76</td>
</tr>
<tr>
<td>26 Amount of encouragement and positive feedback</td>
<td>2.87</td>
</tr>
<tr>
<td>16 Submission of treatment methods used in your unit (e.g. functional, team, primary)</td>
<td>2.96</td>
</tr>
</tbody>
</table>

Control / responsibility

<table>
<thead>
<tr>
<th>Control / responsibility</th>
<th>2.85</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 Your participation in decision making</td>
<td>2.55</td>
</tr>
<tr>
<td>22 Control what happens at your workplace</td>
<td>2.62</td>
</tr>
<tr>
<td>29 The amount of your responsibility (at work)</td>
<td>3.11</td>
</tr>
<tr>
<td>30 Your control over working conditions</td>
<td>3.13</td>
</tr>
</tbody>
</table>

Praise / recognition

<table>
<thead>
<tr>
<th>Praise / recognition</th>
<th>3.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Recognition of your work from your supervisor</td>
<td>2.71</td>
</tr>
<tr>
<td>25 Recognition of your work from colleagues</td>
<td>3.29</td>
</tr>
</tbody>
</table>

Co-workers

<table>
<thead>
<tr>
<th>Co-workers</th>
<th>3.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 The doctor who works with you</td>
<td>2.78</td>
</tr>
<tr>
<td>13 Directly supervise of your supervisor</td>
<td>3.05</td>
</tr>
<tr>
<td>14 Nurse colleagues (in working relationships)</td>
<td>3.47</td>
</tr>
</tbody>
</table>

Interaction

<table>
<thead>
<tr>
<th>Interaction</th>
<th>3.11</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Opportunity to interact with nursing education institutions</td>
<td>2.82</td>
</tr>
<tr>
<td>19 The opportunity to interact professionally with other disciplines</td>
<td>3.15</td>
</tr>
<tr>
<td>18 The opportunity for social contact with colleagues after work</td>
<td>3.24</td>
</tr>
<tr>
<td>17 Opportunity for social contact at work</td>
<td>3.25</td>
</tr>
</tbody>
</table>

Table 6 Cross Tabulation Distribution of Fatigue and Job Satisfaction of Emergency Nurses (n = 55)

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>%</th>
<th>Low</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfied</td>
<td>13</td>
<td>46.4</td>
<td>17</td>
<td>63</td>
<td>30</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>15</td>
<td>53.6</td>
<td>10</td>
<td>37</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
<td>27</td>
<td>100</td>
<td>55</td>
</tr>
</tbody>
</table>

DISCUSSION

Fatigue

Based on the results of the study, the highest mean value in terms of the highest level of fatigue was in the sub variable of physical activity, followed by sub variables of concentration and subjective feeling of fatigue; and the lowest was in the sub variable of motivation. Nurses who experience fatigue can experience problems such as low activity and poor concentration and motivation. Fatigue in this study is the perception of fatigue or the subjective recognition of the respondent. But when viewed from changes in low physical activity, then subjective fatigue proves objectively that respondents experience fatigue.

Fatigue in this study may be the result of workload in related to overcrowding in the Emergency Department of Hasan Sadikin Hospital and nurses are not able to compensate with the situation. This certainly causes an imbalance between the workload and the work resistance. According to literature, causes of fatigue are heavy workloads, staff shortages, shift work, increased demands and expectations of patients, little time for professional development, decreased leadership, inadequate recovery time and personal factors (Canadian Nurses Association, 2012), occupational risk, work time, rest time, tension and stress level of work, and environmental factors (Pratiwi, Karimah, & Marpaung, 2017). However, when viewed from the results of the study, the difference in the number of nurses who experienced fatigue and those who did not
experience fatigue was small. Thus, further study is needed.

Another possibility that can affect fatigue is that the results of the study showed that the majority of respondents were female (72.73%), married (89.09%) and had a working period of >10 years (69.09%). We assumed that work fatigue may be related to the gender and marital status of the respondents. Married female respondents are influenced by their business at home. Besides working in the hospital, they are also required to do homework and take care of their families. This certainly affects the physical resilience of the female respondents, so that the energy used to work in the hospital is residual energy; or otherwise, after exhausting work in the hospital, they run out of energy to take care of their families. This is consistent with the results of previous study (Ismail, 2013) revealed that the quality of work life is influenced by life at home or household.

In addition, most respondents subjectively said that they have rested but still often feel tired quickly. Researchers argue that even though the respondent has rested, the quality of the rest as expected did not occur. This causes the process of the body's mechanism to be disrupted and the energy produced is not optimal. Another possible factor is shift work. Nurses who get shift work will experience biorhythmic changes in the body, especially nurses who often work at the night shift will experience higher fatigue compared to other nurses. This is because they experience sleep deprivation, which cause poor quality of rest.

Satisfaction
In general, nurses' job satisfaction in our study was in the satisfied category, especially in the sub variables of interaction, co-workers, praise / appreciation, control and responsibility. Interestingly, in the sub variable of interaction, one of the items is the opportunity for social contact at work and colleagues after work. In the co-worker sub variables, the item "Nurse colleagues (in working relationships)" becomes the item with the highest mean in the sense of the most satisfied item. This shows that although the condition of emergency department is too crowded, it does not mean the interaction and social contact with peers decreased. In fact, it makes them satisfied. Thus, better interaction and communication with peers increases nurse satisfaction. Previous study stated that job satisfaction has a relationship with satisfaction in communication (Vermeir et al., 2017). Good communication can improve interpersonal and collaborative communication at work as well as improve patient satisfaction with the services provided and ensure patient safety (Keller, Eggengerber, Belkowitz, Sarakseyeva, & Zito, 2013; O'Daniel & Rosenstein, 2008). Therefore, this condition must be maintained with continuity holding regular meetings both at work and outside the workplace.

The results of the study revealed that nurses were dissatisfied with family/work balance ("weekend holidays" and "childcare facilities"), extrinsic awards ("holiday"), and scheduling. This may be caused by conditions in the field, where scheduling and manpower are not met each other, especially for holidays in accordance with the wishes of the nurse. Weekend holidays can only be given in turns, and in some situations a holiday cannot be granted when an extraordinary event occurs in the emergency department. This is in line with previous research stated that job satisfaction has a significant relationship with scheduling (Ebrahim & Ebrahim, 2017).

In the family / work balance sub variable, flexibility in scheduling weekends is a matter that respondents complain about, so that most of their free time is spent at work. This is in accordance with study stated that after respondents were preoccupied with a high workload in the hospital, they were also required to take care of the household / family (Ismail, 2013). This is based on the number of married and female respondents.

The head nurses or related persons must be sensitive with “vacation”, between regular vacation every year or vacation when is needed. As stated by previous study that one can increase employee job satisfaction by
providing fun routine activities to employees (Brunges & Foley-Brinza, 2014). Provision of childcare facilities can be considered for service providers to make it easier for employees to leave their children. Performance awards in the form of holidays, recognition and welfare programs, one of which is childcare facilities can increase job satisfaction (Mohammad Noviar Jayanegara, 2017).

**Linkage of Satisfaction with Job Fatigue**
The results showed that the majority of respondents were more than 36 years old, female, had diploma education, had a working period of >10 years, married and had employment status as civil servants. We assume that what can affect job satisfaction when viewed from the characteristics of respondents is age and tenure. At the age range of >36 years, family economic needs are increasing along with the task of family development. If salary or wages obtained do not meet the needs, dissatisfaction will arise so that the nurse will try to find additional work (part-time) elsewhere. But this condition certainly must consider the factor of fatigue. If the condition of his/her body does not experience fatigue, of course the nurse can do part-time work elsewhere.

For nurses who have worked for more than 10 years, little or more will experience work saturation. Routines that are always carried out every day with all the hustle and bustle in it certainly create a feeling of saturation. This certainly has an effect on the emergence of dissatisfaction at work. Previous research stated that there was no significant relationship between age, working period and job satisfaction (Fritz, 2011). Another study stated that there is a relationship between age and marital status with job satisfaction, and there is no relationship between gender, tenure and level of education with job satisfaction (Setiawan, 2007). Factors related to fatigue are age, sex, years of work and workload. In addition there is also a relationship between fatigue and nutritional status (Perwitasari & Tualeka, 2014).

Other research results related to job satisfaction can be seen in each sub variable. Dissatisfaction is identified in the compensation for work on weekends (sub variable of family / work balance), holidays (sub variable of extrinsic rewards), opportunities for part-time work (sub variable of scheduling satisfaction), opportunities for career advancement (sub variable of professional opportunities), opportunities for writing and publish (sub variable of professional opportunities), control over working conditions (sub variable of control / responsibility), job recognition from peers (sub variable of recognition / praise), direct supervisors (sub variable of colleagues), and opportunities for social contact with work after work (sub variable of interaction).

In regard to working time, respondents often find it difficult to get scheduling arrangements as desired because schedules are made to follow a routine rhythm or change cycle, and thereby they are not able to adjust the holiday time, which increase boredom and stress. Study said that work routines are identical or considered as work culture, which is very closely related to work stress (Yuwono, 2014).

Dissatisfaction is also found in the opportunity to develop careers and opportunities to write and publish. This problem is related to the self-actualization of the respondents. According to some respondents, career development is a hope to be able to grow and get out of a saturating routine. While the opportunity to write and publish is the respondent's efforts to explore themselves or their abilities so that their actualization can be channeled. According to literature, there is a significant negative relationship between the need for self-actualization and work stress. This means that the higher the fulfillment of self-actualization, the lower the level of work stress (Rosiano, Hardijanji, & Yusuf, 2015).

In addition, in regards to responsibility / control and recognition, respondents stated that they were not given full control or responsibility for working conditions because they were only given to certain people. While
the recognition of the work of colleagues is also less satisfying because most nurses are oriented to their respective duties. This affects the self-care of the nurse / respondent, thus creating a work environment that is not conducive and has an impact on unhealthy social interaction. According to study, self-esteem is obtained from oneself and others. Individuals will feel high self-esteem if they often experience success. Conversely, individuals will feel low self-esteem if they often experience failure, are not loved, or are not accepted by the environment (Yusuf, Fitryasari, & Nihayati, 2015).

Dissatisfaction also occurs with co-workers, namely the direct supervisor. This relates to the style of leadership, policy, scheduling, style of communication from the boss that makes it uncomfortable for subordinates. This also relates to work stress from nurses / respondents. All of the above conditions are closely related to fatigue that occurs because the nurse experiences work stress. Study explained that fatigue is influenced by stress, trust in management, personal health, work / family conflict, burnout, and work commitment. Stress and work / family conflicts provide an important and significant picture of the emergence of fatigue from workers / staff. It is also concluded that psychosocial factors are good predictors of work-related fatigue (Rahman, Abdul-Mumin, & Naing, 2016).

CONCLUSIONS

It was concluded that the level of fatigue is in the high category, especially in the sub variables of physical activity, followed by concentration, subjective feeling of fatigue and motivation. While the level of job satisfaction of nurses is in the low category, particularly in the sub variable of family / work balance, followed by sub variables of extrinsic rewards, scheduling satisfaction, professional opportunities, control / responsibility, praise / recognition, and co-workers. And the highest satisfaction was in interaction sub variable. The hospital management is expected to rotate the work schedule for better interaction among nurses, provide opportunities for all staff to be involved in research or other scientific work, and schedule family gatherings regularly to improve togetherness between staff and their families.

Declaration of Conflicting Interest
None declared.

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Author Contribution
All authors contributed equally in this study.

References
Fritz. (2011). Hubungan usia, masa kerja dengan kepuasan kerja perawat di ruang rawat inap Rumah


EFFECT OF HEALTH EDUCATION USING VIDEO AND BROCHURE ON MATERNAL HEALTH LITERACY

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Abstract
Background: Fever is manifestation of acute disease on children and contributes to incidence of severe malnutrition and morbidity and the most common reason for parents to deliver children on hospital. Currently, parents still lack knowledge of determination and proper management of fever although intervention of health education has been widely practiced. One obstacle to widespread success of educational intervention is inadequacy of health literacy. Utilization of media with simple and completed information with picture can be developed in communities with low levels of health literacy.

Objective: To understanding the effect of health education using video and brochure on maternal health literacy in the working area of Saptosari Public Health Center, Gunungkidul Yogyakarta, Indonesia.

Methods: This was a quasi-experimental study with pretest and posttest nonequivalent control group design conducted on 15 – 27 May 2017. The questionnaire used was HLS-Asia Q which had been modified. Health education intervention was done using a five minute-duration video about fever management in children preceded by discussion about the content of the video. Cluster sampling technique was applied with mothers who have under five children as the respondent involving 45 respondents for intervention group and 42 respondents in control group. Data analysis used independent sample t-test.

Results: There was an increase in average maternal health literacy provided with video and brochure media compared to the maternal health literacy given with standard treatment. Intervention group mean difference value was 6.6444 ± 9.6086 and value of difference of control group mean equals to -2.4762 ± 12.0674 (p value <0.001).

Conclusion: Health education intervention using video has a higher impact in the development of maternal health literacy compared with the standard intervention using brochure.

Keywords: maternal health literacy; health education; fever management

INTRODUCTION

Fever is manifestation of acute disease on children and contributes to incidence of severe malnutrition and morbidity and the most common reason for parents to deliver children on hospital or other health services. Every year in United States, as many as 60 million children with fever visited to health services and about eight million entry to ED. Similarly in Indonesia, as many as 16,381 children under five, 74% of children with fever visited health facilities or health workers (Statistics Indonesia, National Population and Family Planning Board, Ministry of Health, & ICF International, 2012; Wallenstein et al., 2013). Currently, parents still lack knowledge of determination and proper management of
fever. A research done in RSUP Dr. Kariadi Semarang showed 52% respondents had low level of knowledge about fever and 50% had poor fever management (Riandita, Arkhaesi, & Hardian, 2012; Walsh & Edwards, 2006). Parents have misperceptions, misinformation and skills constraints about fever and management (Wallenstein et al., 2013). Parents have limited ability to perform safe care for children with fever at home and lack of knowledge about fever and limited ability to access child fever information and management (Broome, Dokken, Broome, Woodring, & Stegelman, 2003). Research stating that education increases knowledge of fever, reduces the number of visits to health services and decreases the inaccuracy of antipyretic dose (Broome et al., 2003). Although this education intervention is successful, parents’ fears of fever in their children still exist. One of the obstacles widespread the success of this educational intervention is the inability of health literacy in parent (Walsh & Edwards, 2006).

Health literacy is a term used to describe an ability to be involved with information and health service (World Health Organization, 2015). Based on U.S. Department of Health and Human Services, most of adult society (53%) had intermediate health literacy, 22% had basic health literacy, 14% had below basic literacy and only 12% was in proficient category (U.S. Department of Health and Human Services, 2008). In Indonesia, there has not been found any research related to mother health literacy about fever management, but in a research done in Sleman in DM type 2 patients, from 142 respondents there were 123 people (86.6%) had inadequate level of health literacy (Nurkhasanah, Guardian, & Madyaningrum, 2015).

People with inadequate health literacy will have 1.2 - 4 times negative health behavior that can affect children’s health. Moreover, children with acute and chronicles illness who have caregiver with inadequate health literacy will have twice chance bigger to visit health center. The inadequate health literacy in caregivers is related to the low level of preventive behavior and children health outcome (Sanders, Shaw, Guez, Baur, & Rudd, 2009). Based on Orem’s perspective, limited ability of mothers to read and understand written information affect mother’s ability in choosing proper action, decision making, and performing dependent care in fever management (Wilson, Baker, Nordstrom, & Legwand, 2008).

The use of media with simple information and picture media can be developed in communities with low levels of health literacy. Pictorial uses such as pictures, graphics and pictograms improve understanding of educational media. In a randomized control trials (RCTs) using an image-based educational program, 76.3% of respondents stated that the image medium is very useful and helps them to understand the information (Kripalani et al., 2007). The use of image and video education media is recommended for education programs for parents, caregivers and nurses related to fever management in children (Kripalani et al., 2007).

METHODS

Study design
This study was quasi experiment with pretest and posttest nonequivalent control group design, which was conducted in the working area of Saptosari Public Health Center, Gunungkidul, Yogyakarta on 15 – 27 May 2017.

Sample
Population of study were all mother who had under five children and had experienced fever in work area of Saptosari Public Health Center, Gunungkidul, Yogyakarta as many as 539 toddlers obtained from data visit with fever during 2016. The sampling technique in this study used cluster sampling, which the researcher randomly selected the area to be used as the intervention group and the control group. The number of samples in this study were 44 in each group according to inclusion and exclusion criteria. Inclusion criteria in this study were mothers who have children who
have experienced fever following a series of research from pretest, education and posttest as a whole and willing to be the respondent. Exclusion criteria in this study was the mother who works as a health worker and mother who has family members who work as health workers.

**Intervention**

Data collection of intervention group was done by giving pretest to know maternal health literacy preceded by giving health education using five minute-duration animated video media. The animated videos were displayed using the screen. After that, respondents were given a brochure and discussed fever management in children. Pretest and health education were provided by researcher and held at Saptosari Public Health. The treatment given to the control group was to use brochure. The posttest for both groups was done one week after education by visiting the respondents’ house.

**Instrument**

Questionnaire used in this study was HLS-Asia Q that had been modified by researchers (Sørensen et al., 2012). The validity and the reliability of the questionnaire were conducted by researcher with r value count by 0.310 – 0.696 and Cronbach’s alpha value were 0.932.

**Ethical consideration**

The ethics committee of the Faculty of Medicine, Gadjah Mada University approved the protocol of study in April, 2017 (KE/FK/04/3/EC/2017).

**Data analysis**

Independent sample t-test was used to determine the effect of health education with video and brochure to the maternal health literacy.

**RESULTS**

Characteristics of respondents were analyzed to describe characteristics of respondents including age, education, job, income, utilization of health insurance and information about previous fever. Both intervention group and control group had homogeneous characteristics with p> 0.05 that was on characteristic of age, education, income, utilization of health insurance and information about previous fever.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention n=45</td>
<td>Control n=42</td>
</tr>
<tr>
<td>Education Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>40 88.9%</td>
<td>36 85.7%</td>
</tr>
<tr>
<td>Medium</td>
<td>4  8.9%</td>
<td>6  14.3%</td>
</tr>
<tr>
<td>High</td>
<td>1  2.2%</td>
<td>0  0.0%</td>
</tr>
<tr>
<td>Working Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>31 68.9%</td>
<td>12 28.6%</td>
</tr>
<tr>
<td>Not Working</td>
<td>14 31.1%</td>
<td>30 71.4%</td>
</tr>
<tr>
<td>Income Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ minimum wage</td>
<td>17 37.8%</td>
<td>19 45.2%</td>
</tr>
<tr>
<td>&lt; minimum wage</td>
<td>28 62.2%</td>
<td>23 54.8%</td>
</tr>
<tr>
<td>Health Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPJS</td>
<td>24 53.2%</td>
<td>31 73.8%</td>
</tr>
<tr>
<td>Jamkesmas</td>
<td>10 22.4%</td>
<td>3  7.1%</td>
</tr>
<tr>
<td>No Health Insurance</td>
<td>11 24.4%</td>
<td>8  19.1%</td>
</tr>
<tr>
<td>Fever Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14 31.1%</td>
<td>17 40.5%</td>
</tr>
<tr>
<td>No</td>
<td>31 68.9%</td>
<td>25 59.5%</td>
</tr>
<tr>
<td>Age</td>
<td>(Mean ±SD)</td>
<td></td>
</tr>
<tr>
<td>28.93 ± 7.33</td>
<td>26.26 ± 5.01</td>
<td></td>
</tr>
</tbody>
</table>

There was one characteristic of different respondents in both groups such as job with p value = 0.001, which 68.9% of respondents in intervention group had job while in control group 71.4% respondents were not working. The respondents age was mostly in the early
adult category with the average age of respondents in the intervention group was 28.93 ± 7.33 and 26.26 ± 5.01 for control group. The respondents' education was the highest in basic education category, namely elementary school education and junior high school as much as 88.9% in intervention group and 85.7% in control group. Respondents' income was largely below the regional minimum wage of Gunungkidul District, 62.2% in intervention group and 54.8% in control group. BPJS health is the health insurance most followed by respondents, 53.2% in intervention group and 73.8% in control group. Health information about large-scale fever has never been obtained by respondents, in intervention groups 68.9% and 59.5% in control group (See Table 1).

**Table 2** Maternal Health Literacy Before and After Health Education in Working Area of Saptosari Health Center, Gunungkidul, Yogyakarta (n= 87)

<table>
<thead>
<tr>
<th>Group</th>
<th>Maternal Health Literacy Before Health Education (Mean ±SD)</th>
<th>Maternal Health Literacy After Health Education (Mean ±SD)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention (n=45)</td>
<td>113.378 ± 9.18</td>
<td>120.022 ± 8.38</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Control (n=42)</td>
<td>120.929 ± 7.70</td>
<td>118.452 ± 8.96</td>
<td>0.401*</td>
</tr>
</tbody>
</table>

*paired t-test

**Table 2** shows that the average maternal health literacy rate in the intervention group increased from 113.378 ± 9.18 to 120.022 ± 8.38 after providing health education using video media. Literacy of maternal deaths in the control group decreased after obtaining education with brochures i.e. 120.929 ± 7.70 to 118.452 ± 8.96.

**Table 3** Maternal Health Literacy Based On HLS-EU Category Before and After Health Education in Working Area of Saptosari Health Center, Gunungkidul, Yogyakarta (n=87)

<table>
<thead>
<tr>
<th>Maternal Health Literacy Before Health Education</th>
<th>Maternal Health Literacy After Health Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Health Literacy Before Health Education</td>
<td>Maternal Health Literacy After Health Education</td>
<td>Total</td>
</tr>
<tr>
<td>Inadequate n(%)</td>
<td>Problematic n(%)</td>
<td>Sufficient n(%)</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Intervention Group</td>
<td>20(44.44)</td>
<td>25(55.56)</td>
</tr>
<tr>
<td>Control Group</td>
<td>7(16.67)</td>
<td>35(83.33)</td>
</tr>
</tbody>
</table>

Maternal health literacy in both groups based on health literacy categories according to HLS-EU 2012 was largely in the problematic category, 55.56% in the intervention group and 83.33% in the control group (see **Table 3**).

**Table 4** Mean Difference of Maternal Health Literacy in Intervention and Control Group in Working Area of Saptosari Health Center, Gunungkidul, Yogyakarta (n=87)

<table>
<thead>
<tr>
<th>Difference of Posttest – Pretest</th>
<th>Mean ± SD</th>
<th>95% CI</th>
<th>p</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference of Intervention Group (n=45)</td>
<td>6.644 ± 9.6086</td>
<td>4.48 – 13.75</td>
<td>&lt; 0.001</td>
<td>0.836</td>
</tr>
<tr>
<td>Difference of Control Group (n=43)</td>
<td>-2.4762 ± 12.0674</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The independent sample t - test was used to examine whether the effect of health education with video media on maternal health literacy, and its results showed p <0.001, which means that health education with video media had a significant effect on maternal health literacy. And the value of d (Cohen) was 0.836, which indicated that health education using clinical
video media had a significant effect on maternal health literacy improvement (see Table 4).

**DISCUSSION**

Health education with audiovisual media significantly affects the improvement of health literacy about fever in mothers who have children under five in the working area of Saptosari Health Center, Gunungkidul, Yogyakarta. Mothers who get health education interventions with video media have an average increase in health literacy rates compared to those in the control group. This is also proven statistically proven by test results of independent sample t-test obtained p value <0.001 with value 95% CI equal to 4.48 – 13.75.

Simple health education design provides ease and clarity for nurses as educators in explaining child-care with fever. Videos can be provided with brochures that can be brought home by the mother. The provision of health education by using audio visual provides benefits for nurses in terms of time, energy and similarity in providing education (Alqudah, Johnson, Cowin, & George, 2014). This was also the case in this research, the researchers were saving time and effort as well as in the provision of education have similarities in the three days of educational implementation because the material was delivered in the form of audio visuals whose contents were always the same.

The use of colored and moving images was used to attract respondents. Mothers will be more interested in audio visual media because the media is more attractive, using simple language that comes with animations that support the explanation of the contents of the provided fever material as well as the information obtained will be more memorable by the respondents. Audio visual media can convey messages or information in a more concrete or concrete way than information conveyed through audio or visual media only. Audio visual media also has a creative aspect that enhances interest from respondents (Barani, Mazandarani, & Rezaie, 2010). The use of integrated audio and visual media will provide better learning stimuli so that more information can be absorbed. According to research data by Sovocom Company, USA which measures memory ability through various types of media, the highest level of memory ability acquired through video media (audio visual) is 50% (Chaeruman, 2007).

Animated video media is a great way to deliver complex health messages to people with low literacy rates. The results of the study indicated that education with animated video media could increase memory in the intervention group with the value of p = 0.02 (Meppelink, van Weert, Haven, & Smit, 2015). Research respondents were educated with animated video media considering information as good as high-literate respondents. The provision of educational media with this animated video can bridge the distance of information processing between people with low literacy levels and people with high literacy rates. Educating media by using animated video does not negatively affect participants with high levels of literacy, it can be concluded that information that is acceptable to low-literate people is also well received by people with high literacy.

Maternal health literacy in both groups before health education was largely in the problematic category. According to literature, inadequate and problematic categories included in limited health literacy (Sørensen et al., 2015), it can be concluded that overall research respondents are in the category of limited health literacy (100%). The limited level of literacy is likely to be caused by many factors among the respondents ‘educational level, most of which are basic education, the respondents’ income is less than the minimum regional wage of Gunungkidul District and the lack of health information.

The level of mother's education in both groups was largely within the basic education range of elementary school and junior high schools. Low respondents' education is associated with
low levels of literacy so it can affect the low health status (van der Heide et al., 2013). However, even though the level of education attained and the long education has been closely tied to one's health literacy, one's educational status does not necessarily reflect the level of health literacy (Kickbusch, 2001), it is also seen in this study, in which a single person with high education, but have health literacy in the problematic category. In addition to education factors, income factors are likely to be the cause of poor health literacy in respondents, economic circumstances that are less related to low health literacy (Ng & Omariba, 2011). Information about previously unhealthy fever that the respondent has never had is also likely to be a factor affecting the low level of maternal health literacy. Increasing public access to health information and their capacity in using them effectively is crucial in the issue of health literacy (Santosa, 2012). Good decisions about health issues require comprehensive health information accessible easily as per the individual needs and socio-culture.

CONCLUSION

There was a significant and higher improvement of maternal health literacy after given health education using audio-visual media than health literacy of mothers after health education using brochure. Thus, it is suggested that nurses should continuously give health education using audio-visual media to increase maternal literacy in their practice to prevent the diseases in mothers and their children.

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None declared.

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Author Contribution
All authors contributed equally in this study.

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Klinik Dokter Keluarga Fakultas Kedokteran Universitas Indonesia Kiara [Factors associated with health literacy of patients at Family Physician Clinic of Faculty of Medicine of Universitas Indonesia Kiara]. Jakarta: Universitas Indonesia.


CHALLENGES IN NURSING EDUCATION IN CAMBODIA: A PERSPECTIVE FROM A NURSE

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Keywords
nursing education; Cambodia; challenges

After passing the Khmer Rouge regime from 1975 to 1979, Cambodia starts to develop its own country with limited resources to compete with the other ASEAN countries. The Ministry of Health (MoH) of Cambodia has been pushing and encouraging nursing schools to produce more human resources for better health of community.

Historically, Cambodian nursing education started from the end of 10th centuries and the beginning of 11th centuries along with the leadership of the Queen INDRADEVY and Khmer’s pharaoh JAIYAVARMAN-VII during the Angkor era. In 1979, the primary nursing and midwifery course was firstly commenced. In 1980, the 3-year program (called as Diploma of Secondary Nurse) started and recognized as the highest nursing education at the national level (Cambodian Council of Nurses, 2007). Today, there are only five government schools of nursing are established: one in Phnom Penh called as Technical School for Medical Care (TSMC) under the umbrella of the University of Health Sciences (UHS), and the other four schools are Regional Training Center (RTC) located in four provinces, at Komport, Kompong Cham, Battambang and at Stung Treng under direct supervision of MoH, which have been operated in the entire country with a very limited facilities (International Council of Nurses, 2017).

The University of Health Sciences is well known as the oldest government university in Cambodia, which offers various programs in health sciences including nursing, medicine, dentistry and pharmacy under the support from MoH (University of Health Science, 2013). Led by the UHS’s Rector, Professor Saphonn Vonthanak, nursing program has more opportunities to expand international networking and provide more nursing programs such as: Associated Degree in Nursing (AND) for 3 years, Bachelor of Sciences in Nursing (BSN) as national program, and International Program for Bachelor Nursing (IPBN) for 4 years. In addition, the upgrading program is also established, which is called as Bridging Bachelor Nursing (BBN) for 2 years in
part-time curriculum (one week per month and 9 hours a day from Monday to Saturday), and Bachelor of Ophthalmic Nurse (BON) for full time with 1-year curriculum established in 2014. Both programs are eligible for those who hold ADN diploma certificate (University of Health Science & National Institute of Public Health, 2016). Specifically, the UHS has been nominated as the Technical Working Group (TWG) in order to develop the curriculum of Master of Sciences in Nursing to support further education to all nurses in Cambodia. The TWG will be working as well with the local and international stakeholders.

On the other hand, private universities are also established in Cambodia, such as the International University (IU), the University of Puthisastra (UP), the Chenla University (CU), the Norton University (NU), and the Health Sciences Institute of Royal Cambodian Armed Forces (HIS-RCAF) to produce more nurses with better quality in Cambodia. However, the successfulness of nursing education is not without its challenges. This article aims to provide some challenges in nursing education in Cambodia, according to my perspective as a nurse.

CHALLENGES IN CAMBODIAN NURSING EDUCATION

There are some challenges to improve the nursing education in Cambodia, namely:

Lack of faculty members with higher degree
There are limited faculties who have obtained master degree or doctoral degree in nursing filed. Currently, there is only one PhD in Nursing. Dr. Virya Koy, who has just graduated from Chulalongkorn University Thailand. There are 8 nurses who currently holding master degree from Thailand, Philippines, and about 2 nurses are still undergoing master nursing program in South Korea. However, not all graduates are majoring in nursing, but specifically in health professions education, public health, and nutrition. This may limit the knowledge or understanding regarding nursing and its underpinning philosophy. Although the Ministry of Health of Cambodia has been encouraging nurse educators to continue education since 2001 (Koy, 2016), but nurse intention to continue education remains low. It may be due to lack of promotion for nurses who hold higher degree to get higher position, lack of scholarship or educational supports from the government, and the absence of master nursing program in Cambodia, which force nurses to go out of the country leaving their family. However, the factors related to nurse intention to continue education should be further explored for more understanding.

Lack of facilities for clinical nursing practice
Most universities offering health sciences program have no own teaching hospital for practice while the number of students have increased every year. Thus, this should be prioritized. The teaching hospitals should be added in response to this issue to ensure the proper knowledge and skills of the future nurses.

Different types of nursing degrees
Cambodia is similar with the other ASEAN countries such as Indonesia and Lao PDR, which has different types of nursing background, such as associate degree in nursing (diploma) and bachelor of sciences in nursing (Aungsuroch & Gunawan, 2015). Practically, both levels do not have much difference in clinical practice. Thus, the job description should be further explored and identified. In addition, nurses who have bachelor level should be able to do at least descriptive nursing research and use evidence-based practice. However, according to my perspective, diploma nurses may fit with the current needs of Cambodia to provide the basic needs of people in rural area.
Limited of research studies in nursing
Bachelor of Sciences in Nursing (BSN) program has given an opportunity for students to do nursing research as one of the requirements for completing the study. However, most of research is using secondary data, instead of conducting original research from primary data. As the results, the research skills of the graduates are still limited to identify the research needs with appropriate issues in Cambodia with appropriate methods. Thus, this issue should be more emphasized for better nursing education, practices and research.

Lack of use of technology in nursing education
We are now living in the digital era, and it is therefore we should be able to utilize it, especially in nursing education. However, there is still lack of ability of faculty members to use that technology, and the poor Internet access as well as limited access to database, which is considered as the weakness of nursing education today in Cambodia.

In conclusion, by identifying the challenges related to nursing education, all nurses in Cambodia are invited to support each other, and analyze the strengths and weakness for providing better education in order to enhance the quality of nurses to provide better quality of care, patient safety and effective health services delivery in Cambodia.

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Author Contribution
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Dealing with patients’ death is a personal yet a challenging experience for nurses. In a setting like intensive care unit (ICU), the death might be a part of nurses’ daily basis where nurses witness many deaths of the patients. Witnessing repetitive death of the patients result to nurses’ physical and psychological distress including sleep disturbance, intention to leave the unit they work, feeling guilty and regret (Anderson, Kent, & Owens, 2015). These reactions related to professional stigma which occurs among nurses.

Professional stigma is a condition where nurses are able to accept the grief of patients and their families, but they cannot accept their own and their colleagues’ grief (Wisekal, 2015). This condition cause nurses to experience disenfranchised grief without their knowledge. Disenfranchised grief is defined as the condition of grief which is not acknowledged publicly, the mourners do not realize that they feel the grief until people around them recognize their change behavior as the result of their grief reaction (Doka, 1987). Some nurses reacted to patients’ death by hiding their feeling and grief inside and acted as nothing happens until their family recognize their changed behavior as their reaction of patients’ death. The grief that nurses feel may relate to their empathy for patients and families. Empathy is the capability of nurses to feel and understand others’ feeling. Nurses may feel the grief because they feel the loss and understand the loss felt by bereaved families (Carper, 2014).
However, it is also important to maintain professional nursing image in that situation. As a professional care provider, nurses should understand their own feeling, how to deal with their feeling, and what they are supposed to do in that situation. Nurses may feel the grief inside and have different reactions when their patients die but in the same time they should provide psychological and spiritual support for patients’ families. Being able to provide support for families in that situation is possible to do when nurses can recognize and effectively cope with their own grief.

Dealing with patients’ death does not always lead to negative consequences. Despite of various reactions concerning patients’ death, some others found meaning in dealing with the death of the patients. Previous study exploring the lived experience of grief among Muslim nurses in Indonesia revealed that nurses found the meaning of life and death through their grief experience (Betriana & Kongsuwan, 2018). In their study, under the thematic category of lived time ‘anticipating the future of own death’, the nurse participants admitted that their awareness of being good in life increased. Experiencing patients’ death becomes a moment to appreciate the life and prepare themselves for their future death and life after. Similarly, another study investigating front line end-of-life care among resident care aides found that the participants created meaning about life and death after dealing with patients’ death. In their study, the participants understand that death is a normal part of life that should be accepted and prepared (Funk et al., 2014).

Being a nurse and dealing with many deaths are not supposed to make nurses lower their empathy. Conversely, nurses experience the grief and more empathy. Nurses’ grief becomes a phenomenon effecting nurses across cultures, beliefs, and nations. Despite of the possible negative consequences caused by their grief, they found and created the meaning within their grief experience. They become understand the sense of life and death. The more they see the death, the more they learn about life.

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**Author Contribution**
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MANAGING SYMPTOM CLUSTER AMONG PATIENTS WITH CHOLANGIOCARCINOMA: A CALL FOR NURSES

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Keywords
symptom cluster; cholangiocarcinoma; nurses; management

Patients with cholangiocarcinoma (CCA) often suffer from multiple coexisting symptoms throughout the course of their illness and treatment. It is possible that one symptom could be the direct or indirect cause of another symptom which could be correlated to underlying physiological or psychological mechanism (Barsevick, Whitmer, Nail, Beck, & Dudley, 2006). Dodd, Miaskowski, and Paul (2001) defined symptom cluster as the co-occurrence of two or more correlated symptoms which may have a common etiology and might have synergistic effects on individual outcomes.

Approximately, 90% of patients with CCA have suffered from at least one symptom and sometimes many symptoms, and the symptoms that patients felt most distressing were abdominal pain, fatigue, and lack of appetite (Somjaivong, Thanasilp, Preechawong, & Sloan, 2011). Recent studies indicated that pain, fatigue, and sleep disturbance were associated symptoms and analyzed it as cluster (Kwekkeboom et al., 2018; Miaskowski et al., 2017). The major factors that influenced intensity of symptom cluster include the stage of CCA, side effects of treatment, and life transitions (Cai et al., 2016). Poor management of symptom clusters impacts on many negative results such as complicates patient care, increases hospitalization and resource utilization, impacts on individually quality of life, and contributes to heavy burden on family caregivers (Steel et al., 2016; Tiesi, Stuart, Yakoub, & Livingstone, 2016).

Moving toward the future of nursing care, the paradigm to manage the symptom experience has shifted from a single symptom to multiple symptoms or symptom clusters. In a clinical context, it is well established that symptoms co-occur but are treated independently. Nurses play a crucial role in managing of multiple coexisting symptoms and clinical judgment regarding possible etiologies of cancer symptom cluster in clinical practice. Nurse should emphasize on theoretical framework that explain the impact of experiencing multiple symptoms. Applying these theories, for example unpleasant symptom theory or symptom management model may enhance a foundation for the current trend...
to investigate the treatment of symptom cluster in nursing science and practice.

Caring for patients with CCA involves several challenges that call for a variety of nursing skills. First, nurse need to be able to assess characteristic, number, and mechanism of symptoms that co-occur in cluster. Using a valid and reliable assessment tool can help patients to verbalize and clarify their symptom experience into a more objective form, which may help nurse to organize nursing care plan and intervention. Second, nurses should consider the precipitating factors that trigger multiple symptoms occur concurrently which aim to fixing the root cause of the problem. Then nursing diagnosis should be created in order to response to the potential health conditions or needs. Third, nurse should set measurable and achievable short- and long-range health outcome such as reducing intensity of symptom cluster, increasing physical activity, and quality of life. Fourth, nurse should be able to select and implement an adequate intervention that aim to manage symptom cluster among this population. Finally, evaluation is recommended to test the effectiveness of the intervention for managing the symptom cluster among patients with CCA in a particular different cultures and oncology settings. Importantly, patients and relatives must be addressed with empathy and professionalism at all times of caring. It is hope that this article has contributed to a better understanding of managing symptom cluster in patients with CCA.

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This is the original work of the corresponding author.

References


