Volume 5 Issue 1: January – February 2019

BELITUNG NURSING JOURNAL

https://belitungraya.org/BRP/index.php/bnj/index

Online ISSN: 2477-4073

Volume 5 Issue 1
https://doi.org/10.33546/bnj.v5i1

Belitung Nursing Journal (BNJ) is a refereed international publication that provides a venue for nursing scholarship with an Asian focus and perspectives from the region. We aim to highlight research on nursing science, nursing management and policy, and nursing education and practice in the Asia-Pacific region and among Asian communities around the world to a wide international audience.

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BELITUNG NURSING JOURNAL

Volume 5 Issue 1: January – February 2019

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BNJ is an official publication of Department of Publication of Belitung Raya Foundation in Belitung Indonesia, jointly with Indonesian National Nurses Association of Belitung Indonesia (PPNI Belitung) and Prodi D3 Keperawatan Belitung Poltekkes Kemenkes RI Pangkal Pinang.

Belitung Raya Foundation is a non-profit organization which focuses on education, health, information technology, and social and empowerment of the community. Belitung Raya Foundation is established since 2015 with official license of establishment from the Ministry of Justice and Human Rights of Republic of Indonesia (MENKUMHAM RI) with No: AHU-0009599.AH.01.12.Year 2015 and Notarial Deed No: 12 on 06 July 2015 by SRI ARIYAWATI, SH.,M.KN.

BNJ has been accredited by the Ministry of Science, Research, Technology and Higher Education of Indonesia (RISTEKDIKTI RI) with No: 10/3/KPT/2019, valid until 2024 (SINTA grade 3).

BNJ is indexed in Ovid EMCare (Elsevier), DOAJ, SINTA, Google Scholar, Garuda, ROAD, JournalTOCs, and WorldCat.

First published by Department of Publication of Belitung Raya Foundation
Manggar Belitung Timur Propinsi Bangka Belitung, Indonesia
Email: editorbnj@gmail.com | belitungrayafoundation@gmail.com

Volume 5 issue 1: January – February 2019
Library of Congress Cataloging-in-Publication Data
Belitung Nursing Journal Volume 5 Issue 1
E-ISSN 2477-4073
P-ISSN 2528-181X

Editor's Note: This issue has been corrected and updated with minor changes on 14 June 2020 according to BNJ Policy

EDITORIAL TEAM

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DOI: https://doi.org/10.33546/bnj.v5i1

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BNJ BELITUNG NURSING JOURNAL

EDITORIAL

VIEWPOINT: NURSES PREPARATION IN THE ERA OF THE FOURTH INDUSTRIAL REVOLUTION

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Article Info:
Received: 10 February 2019
Accepted: 10 February 2019

DOI:
https://doi.org/10.33546/bnj.744

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KEYWORDS
Industry 4.0 revolution; nursing; disruption; technology

ISSN: 2477-4073

We are now experiencing an era of the fourth industrial revolution characterized by a fusion of disruptive technologies like cyber-physical systems, cloud technology, cognitive computing, robotic process, artificial intelligence, and the Internet of Things, which impact every health care industry in both developing and developed countries, from being manpower-intensive to being technology-centric. The example of health care delivery model driven by technology changes today can be seen from our customers who often use online consultations to healthcare professionals to get the treatment (Milton, 2018). In some countries, for example, Japan has been developing various types of humanoid nursing robots for delivering nursing care (Tanioka et al., 2017), which poses a challenge for nurses around the world, and changes how we work, live and play. In addition, this era is considered as a threat for unskilled workers or new graduates who are at a high risk of being left unemployed. Therefore, we need to be able to prepare ourselves to establish the impacts on nursing practice and patient outcomes. This editorial is to highlight some points for nurse preparation in the fourth industrial revolution.

Nurse's preparation for Industry 4.0

Disruptive innovation

Disruption is not a new idea, which is also considered as the nature of capitalism with technology progress and evolution. Disruptive innovation means a process of translating an idea or invention that creates a new market by applying a different set of values, which ultimately and unexpectedly overtakes an existing market (Pitts, 2012). This reflects that we may not be able to reject the reality by not following the technological expansion, as the yesterday's solution may not be applicable for health challenges today. Nurses need to be aware that technology is a main driver for disruptive innovation in nursing education and practice, which therefore they firstly need to understand what a digital life look like now, compared to what it looked like before. In nursing education, the change is seen from paper-based to online-based education, which includes the innovation of E-learning, long distance learning, mobile platforms, virtual learning, social media, video conferencing, and other methods. In nursing practice, the technology development may include telenursing, triple care by remotely connecting with clients via camera, digital and bluetooth stethoscope, chip monitor, and other methods. However, the premise of disruptive innovation is not about the technology itself, but it is about the application of technology (a new product) in a simple and convenient way, or creating a new environment for using the product that never exists (Sensmeier, 2012).

The concept of disruptive innovation is promising although the consequences will not be positive, but it may improve collaboration and establish nurse professional impact on care, as the main idea of disruptive innovation is to keep the patients at the center of the systems of care among health professionals

supported by smart technology, and to focus on individual patient's needs, rather than focusing on complex disorders and urgent health crises (Sensmeier, 2012). However, to support that disruptive innovation, nurses should have good attitudes and high skills in technology, which is considered as a challenge for those who are not familiar to with informatics system. Therefore, to attend the informatics system training and development is necessary to use or apply a nee technology intelligently.

Understanding nursing philosophy

In response to the industry 4.0, nurses must be grounded in their discipline. Understanding philosophy in nursing is needed, which nurses step back from what they do to see what nursing is all about and to think critically about others' opinion on the matter (Kikuchi & Simmons, 1996). Nursing has *caring* as its core in a way practicing of loving-kindness and equanimity, authentic presence with deep belief of others, cultivation of individual's own spiritual practice toward wholeness of mind/body/spirit, being the caring healing environment and being open to unexpected life events (Watson, 2010). *Caring* is dependent on where we are (time, space, culture), one's level of development (e.g. training, experience, education), and the situation (e.g. disaster, high pressure or relaxed situation, etc.), including consideration of patient's (subjective) perspective and nurse (objective) perspective (Gunawan, 2016). Therefore, although we are surrounded by technology and robotics in this disruptive era, nurses with human caring with personal soft skills will not be replaced at all. Nurse educators should emphasize *caring* in any parts of the subjects in nursing curriculum, and nurse leaders should continually promote *caring, caring* relationship and *caring* moment in nursing practice.

To sum up, to accelerate pace of change in the today's era, nurses need to find innovative approaches to create a new product or a new environment, and bring together all different perspectives to integrate evidence into care delivery and decision making to serve nursing and patients well, supported by an advanced technology and a strong foundation in nursing philosophy.

Declaration of Conflicting Interest

None declared.

Funding

None.

Authorship Contribution

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Cite this article as: Aungsuroch, Y., Gunawan, J. (2019). Viewpoint: Nurses preparation in the era of the fourth industrial revolution. *Belitung Nursing Journal, 5*(1), 1-2. https://doi.org/10.33546/bnj.744

Uligraff, D, K. (2019). *Belitung Nursing Journal. 5(1): 3-5*
https://belitungraya.org/BRP/index.php/bnj/index

BNJ BELITUNG NURSING JOURNAL

REVIEW ARTICLE

UTILIZING POETRY TO ENHANCE STUDENT NURSES' REFLECTIVE SKILLS: A LITERATURE REVIEW

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Article Info:
Received: 10 October 2018
Revised: 8 November 2018
Accepted: 5 December 2018

DOI:
https://doi.org/10.33546/bnj.631

Abstract

The notion of reflective practice has been considered important in healthcare professionals' practice. In nursing, particularly in developed countries such as the United Kingdom, Canada, Australia, it has been set as a required competence for registration. Some action has been taken to support the achievement of competent and reflective practitioners, including embedding reflection in the nursing pre-registration education curriculum. In the past twenty years, there has been focus on using art-based initiatives to help student nurses to reflect on their clinical experience. Amongst the art forms, poetry has been used as a reflective tool. Many studies found that poetry could be helpful for developing students' reflective skills. This literature review was conducted to identify the feasibility and promising benefit of using poetry to increase student nurses' reflective skills. A comprehensive search of the literature and integrative review were undertaken for reviewing and discussing the evidence-based literature that supports the using of poetry as a reflective tool. A critical and narrative approach was undertaken for 16 relevant literature related to the importance of reflection in practice, the promising potential to enhance students' reflective skills during academic education, and how poetry might promote students' reflective skills. The literature review showed that using poetry in education have been carried out, and have yielded positive results. It is promising to note that the development of reflective practice, as required to be an attribute of a registered nurse, could be stimulated and achieved by the employment of poetry as a reflective tool in clinical education. The literature review also demostrated that using poetry as a reflective tool in nursing education is both feasible and worthwhile. Therefore, it is proven that using poetry as a means of reflection in an education setting is beneficial and valuable.

KEYWORDS
poetry; reflective skills; nursing education

ISSN: 2477-4073

INTRODUCTION

Education has been considered as an important activity for humankind. It aims to unleash and promote an individual's potential (Dewey, 1970a, 1970b; Quay & Seaman, 2013; Wringe, 1988) as well as bring about and preserve society (Wringe, 1988). As the time passed by, there was a shifting belief that education was not merely based in, and was identical with, classrooms and books as traditionally perceived, but that education was a progressive process which involved any event by any means to achieve its aims (Dewey, 1970b; Quay & Seaman, 2013). Therefore, someone needs to reflect on, evaluate, and gain ability to recreate his/her experience, in order to grow. Dewey (1970) divided experience into two types: primary and secondary. The former refers to the starting and end point of inquiry, whereas the latter refers to the inquiry itself,the process of knowledge-yielding which is critical and reflective (Dewey, 1970a). Therefore, reflection should be an indispensable condition for experiential learning and education in general.

By means of reflection, a learner could become reflective as he/she starts to be able to identify the problem or a new thing, relates it with a context or situation(s), and tries to formulate an

idea, by reconstituting and testing possible ideas (hypothesis) for solving the problems. Therefore, in reflecting, the individual may need to think and inquire throughout the process by exploring and using existing materials, or even constructing new ones to resolve the problem within its context. For this reason, reflection is neither merely a descriptive nor explanatory process, but a transformative process. This nature of reflection must be in accordance with the ultimate aim of education, which has been mentioned above. Therefore, reflection would be a key to the success of experiential learning (Moon, 2004; Quay & Seaman, 2013).

Reflection has also been considered and used in both nursing practice and education (Clarke, James, & Kelly, 1996; Clouder, 2000; Duffy, 2009; Gustafsson & Fagerberg, 2004; Hargreaves, 2004; James & Clarke, 1994; Johns, 1995; Lindahl, Dagborn, & Nilsson, 2009; McBrien, 2007). In nursing, the use of 'reflection' is strongly related to the term 'reflective practice' and often the two terms/concepts are used interchangeably in the nursing literature (McBrien, 2007). Reflective practice is considered as an important process in nursing; it is considered as a compulsory competence in order to be a registered nurse in several countries; for instance Australia, Canada, the United States (US), and the United Kingdom (UK) (Burton, 2000; Epp, 2008; Nelson & Purkis, 2004). In the UK the ability to reflect is stated clearly in the Code for Nurses (Nursing and Midwifery Council, 2015) and Standards for Pre-registration Nursing Education (Nursing and Midwifery Council, 2010), showing how the UK's Nursing and Midwifery Council (NMC) considers reflection to be part of a registered nurses independent competence. In the Code, reflection is stated in the preamble of the domain '*Practice Effectively*', whereas it is consistently stated in the domains of '*Professional Values*', '*Nursing Practice and Decision Making*', and '*Leadership, Management, and Team Working*' for all fields of pre-registration nursing education. These examples, therefore, may indicate that reflection, or being a reflective practitioner, has not only been considered as important in practice, but also should be developed even when nurses are still students (Burton, 2000; Lindahl et al., 2009).

Poetry has been considered and developed as a pedagogical tool in professional education, possibly because its nature seems relevant to humanities, which are placed at the core of social science (Coleman & Willis, 2015; Hahessy, 2016; Jack, 2015; Raingruber, 2009). Poetry may be considered positively because of its capacity to achieve and foster several aspects, which are apparently essential to the humanities. Several recent studies have investigated the benefits of using poetry in professional education: enhance learners' emotional intelligence towards themselves, colleagues, and patients; enhance learners' professional communication; be an effective educational approach to reveal the relevance of studies to humanities; enhance memory and broadening learner's paradigm and experience of education and its approach; increase understanding of subject; and reduce learners' stress, anxiety, and depression (Clancy & Jack, 2016; Foster & Freeman, 2008; Jack, 2015; Mohammadian et al., 2011; Wright, 2006). All these benefits of using poetry in education seem in accordance with the advantages of doing reflection, which has been discussed above. Therefore, poetry might be used effectively to help students in developing their reflective abilities.

METHODS

The literature review is a set of resources, comprises textbooks, academic articles, legal documents, which have been collected and reviewed to gain a more in-depth and comprehensive understanding of the research topic (Merriam, 2009). For this reason, a set of references, which refer to the most up-to-date and salient materials, are not merely read and summarized, but importantly are analyzed and criticized (Parahoo, 2014).Through reviewing the literature, the existing research evidence about using poetry in nursing education will be presented. The review will establish a rationale for the importance of exploring poetry's capacity to improve student nurses' reflective skills; therefore, it will contribute to justify the proposed study, which will be elaborated in the following chapter. Inclusion criteria of this study were related to the importance of reflective skills in professional education settings, focused on the utilization of poetry in education settings, published between 2006 – 2016, written in English. Exclusion criteria were literature which discussed about reflective skills but not in education settings, using poetry not in professional education settings, and non-published work.

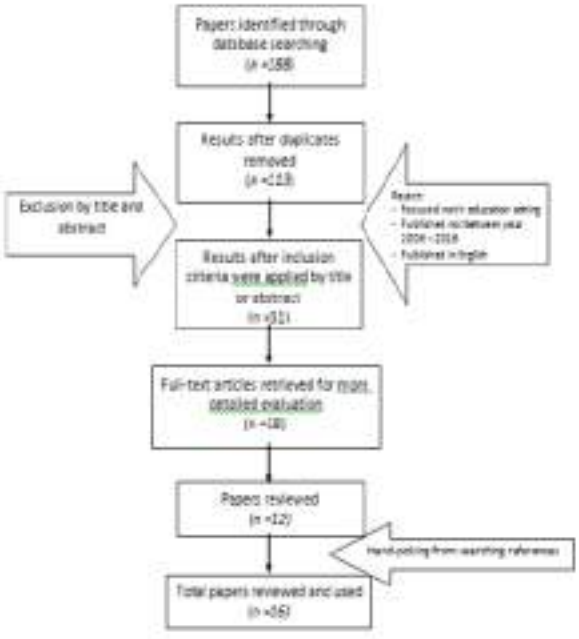

FIGURE 1 Search strategy

This review was conducted in 2016 and reviewed by the author. The author analysed the reviewed studies and extracted to assess whether: (1) enhancing student nurses' reflective skills must be important and feasible to be achieved during academic education and (2) utilizing poetry as reflective tool could be implemented and beneficial for enhancing student nurses' reflective skills. These procedures allowed the author to

synthesis the idea that using poetry as a reflective tool in nursing education is both feasible and worthwhile. A summary of data extraction is illustrated in **Figure 1**. Several search strategies have been undertaken to attain the robust body of literature for supporting this study. The main search strategies were using the electronic databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, Science Direct, MAG Online Library, COCHRANE Lib, EBSCO, PubMed, and PsychINFO. The following single or combined terms were used to retrieve salient papers: "reflection" or "reflective practice" or "reflective thinking", "art-based pedagogy" or "art-based reflection", "poem" or "poet" or "poetry", "poetry in education" or "poetry in nursing" or "poetry in nursing education". Combining two or three terms by using "AND" was also done in order to get more specific and related literature. Moreover, hand searches through reference lists were also undertaken to include relevant articles in the review. A search of key terms was also performed to find other valuable publications through Google Scholar, DiscoverEd (The University of Edinburgh library search engine), and The Knowledge Network NHS Scotland. A total of hundreds articles were identified at this stage. These results were specified as studies, which had been published in English and within the last ten years. Ultimately, a total of sixteen articles will be reviewed and used in this study.

ANALYTICAL FINDINGS

The importance of reflection in education

Many benefits would be gained by using reflection in nursing practice. Reflection could enhance patient-centered care (Coleman & Willis, 2015), stimulate critical thinking (Burton, 2000; Cotton, 2001; Epp, 2008; Jasper, 1999; Lindahl et al., 2009) and critical doing (Burton, 2000), influence nurses' ability to make professional judgment and clinical decision making (Epp, 2008; James & Clarke, 1994; McBrien, 2007; Tashiro, Shimpuku, Naruse, Maftuhah, & Matsutani, 2013), develop self-awareness (Coleman & Willis, 2015; Cotton, 2001; Hargreaves, 2004; Jasper, 1999; Rees, 2012; Tashiro et al., 2013), transform new perspectives (Hargreaves, 2004; Tashiro et al., 2013), enhance the effectiveness of practice (Burrows, 1995; Rees, 2012), stimulate students to bridge the gap between nursing theory and practice (Burton, 2000; Cotton, 2001; Duffy, 2009; Tashiro et al., 2013), encourage students to think about integrating them and changing practice (Epp, 2008; James & Clarke, 1994), enhance long-life learning in nursing education (Burton, 2000; Coleman & Willis, 2015; Duffy, 2009), and develop writing skill for the written reflection (Jasper, 1999). Considering the benefits which might be gained by developing students' reflective ability, it is not surprising that reflection has been considered as an important competence for nurses and student nurses.

For more than twenty years, reflection has been immensely popular as a pedagogical tool in nursing education (Bradbury-Jones, Coleman, Davies, Ellison, & Leigh, 2010). Many guided models of reflective writing have been developed and used in implementing reflection in education, for instances John's guided model of reflection (Coward, 2011; O'Connor, 2008), Driscoll's model (Macdonald, 2015), Gibbs cycle (O'Connor, 2008), Peshkin approach to reflection (Bradbury-Jones et al., 2010), Value-Based Reflective Practice (VBRP) (Paterson & Chapman, 2013; Rankin, 2013), or narrative journaling in a specific format which is developed by institution (Burrows, 1995; Epp, 2008; Hargreaves, 2004). However, there have been several critiques about using a model or guided format in reflecting, which mostly emphasized that it may restrict the breadth of reflection; an outcome that could inhibit students to think critically (Burrows, 1995; Coleman & Willis, 2015; Coward, 2011; Epp, 2008). Other negative outcomes resulting from using the same model for years in nursing education include 'reflection fatigue' (Burton, 2000; Coward, 2011; Macdonald, 2015), a condition in which students become apathetic to reflection, and misunderstanding of reflection's purpose (Coleman & Willis, 2015; Coward, 2011). Consequently, the roots of reflection might disappear (Coward, 2011) and the ultimate aim of reflection might not be achieved. For this reason, the development of innovative strategies for reflecting, particularly in education, is paramount (Epp, 2008). In recent years, using art-based pedagogies has been considered and developed as a means to bring back the nature and aim of reflection (Casey, 2009; Hahessy, 2016; Jack, 2015; Macdonald, 2015).

The importance of reflection in practice

Several current studies showed the importance of reflection, especially in practical-based professions (Chelliah & Arumugam, 2012; Hatlevik, 2012; Noormohammadi, 2014; Rees, 2012), including nursing. Reflection may be beneficial to improve learners' clinical skills (Chelliah & Arumugam, 2012), positively influence someone's self-efficacy and autonomy (Noormohammadi, 2014), bridge the gap between theory and practice in nursing education (Hatlevik, 2012), maintain and develop professional attributes (Rees, 2012), and manage their distressing emotional challenges and the labour of nursing work (Rees, 2012). In many countries, student nurses are prepared to be reflective practitioners who are able to demonstrate reflective thinking in their practice. Therefore, reflection has been introduced and used as part of the nursing curriculum (Coward, 2011). It might be beneficial for being a reflective practitioner in daily practice is undeniably difficult and reflective thinking itself is a difficult skill to develop and apply (Clegg, Tan, & Saeidi, 2002; Duffy, 2009). Therefore, the development of reflective thinking must not spontaneous but should be deliberately stimulated by and in the educational context (Mann, Gordon, & MacLeod, 2009). The development of reflective skill during academic education may be achieved through discovering the appropriate means to stimulate students' reflective skills, such as portfolio, reflective journal, and reflective assignment, and by then including that method into the curriculum.

Why Poetry?

One of the art-based approaches that have been used in several developed countries, with positive outcomes for reflection, is poetry (Casey, 2009; Foureur, Bush, Duke, & Walton, 2007; Hahessy, 2016; Holmes & Gregory, 1998; Wright, 2006).

Poetry itself has been used across education for several professions, including medicine, teaching, social work, and nursing (Jack, 2015). In nursing education, there have been several studies conducted to explore the use of poetry for nursing students. Poetry has been considered as a means to develop students' reflective ability, increase their capacity for compassion and empathy, and reduce their stress (Coleman & Willis, 2015; Foureur et al., 2007; Hahessy, 2016; Holmes & Gregory, 1998; Jack, 2015; Raingruber, 2009; Wright, 2006).

Poetry has been considered and developed as a pedagogical tool in professional education, possibly because its nature seems relevant to humanities, which are placed at the core of social science (Coleman & Willis, 2015; Hahessy, 2016; Jack, 2015; Raingruber, 2009). Poetry may be considered positively because of its capacity to achieve and foster several aspects, which are apparently essential to the humanities. Several recent studies have investigated the benefits of using poetry in professional education (Clancy & Jack, 2016; Foster & Freeman, 2008; Jack, 2015; Mohammadian et al., 2011; Wright, 2006). Several studies denoted that by using poetry in education, there are some benefits gained. Firstly, poetry could enhance learners' emotional intelligence towards themselves, colleagues, and patients (Clancy & Jack, 2016; Foster & Freeman, 2008; Jack, 2015). It also could enhance learners' professional communication (Clancy & Jack, 2016; Foster & Freeman, 2008) and it might be an effective educational approach to reveal the relevance of studies to humanities (Clancy & Jack, 2016; Foster & Freeman, 2008) because it may increase understanding of subject (Jack, 2015). Furthermore, it may enhance memory and broaden learner's paradigm and experience of education and its approach (Foster & Freeman, 2008). Lastly, it may reduce learners' stress, anxiety, and depression (Clancy & Jack, 2016; Jack, 2015; Mohammadian et al., 2011). All the benefits of using poetry in education seem in accordance with the advantages of doing reflection, which has been discussed above. Therefore, poetry could be used effectively to help students in developing their reflective abilities.

The employment of poetry in promoting reflective skills

There were several studies which specifically tried to investigate the employment of poetry for reflective purposes (Coleman & Willis, 2015; Schwind, Santa-Mina, Metersky, & Patterson, 2015; Speare & Henshall, 2014; Threlfall, 2013). By using poetry as a reflective tool, there were two dimensions of affirmation that students can obtain: a) affirmation of their values and beliefs and b) affirmation that their chosen profession is worthwhile (Speare & Henshall, 2014). The students might pay more attention about the linkage between theory and practice whilst they were engaging in the poetry reading activity.

In particular to nursing, poetry is not a new concept (Coleman & Willis, 2015) and has often been considered as a way to achieve the aesthetic part of Carper's Fundamental Patterns of Knowing in Nursing, which are also known as 'the art of nursing' (Coleman & Willis, 2015; Holmes & Gregory, 1998; Jack, 2015). The aesthetic pattern could be defined as the acquisition of knowledge which is gained from subjective experience (Carper, 1978). This model indicates that the subjective experience is the input, the knowledge is the output, and the aesthetic pattern is the means, or in-between process, to acquire the output. Therefore, using aesthetics/an art form (such as poetry) as a means to gain knowledge from experience, might be relevant to the nursing profession and its educators. Students may have a greater sense of patients' feelings and perspectives; the students also felt less restricted and more able to express their feelings. Therefore, using poetry for reflection could be a vehicle to bring the students back from the skeptical paradigm of reflection, to its fundamental purpose (Coleman & Willis, 2015). Furthermore, by using creative activities, such as poetry, students could learn about care and how to care, the importance of caring, and the challenges in providing care (Schwind et al., 2015).

CONCLUSION

From the start of this millennium, studies about the use of poetry in education have been carried out, and have yielded positive results. From the literature review, it is promising to note that the development of reflective practice, as required to be an attribute of a registered nurse, could be stimulated and achieved by the employment of poetry, as a reflective tool in clinical education. The literature review demonstrated that using poetry, as a reflective tool in nursing education, is both feasible and worthwhile. Some studies attempted to prove that using poetry as a means of reflection in an education setting is beneficial; however, it was noticed that most of the studies were conducted in developed countries. Concerning its potential as a professional development resource, it was considered valuable to bring the concept of using poetry as a reflective tool into a developing country setting.

Declaration of Conflicting Interest

None declared.

Acknowledgment

I am grateful to Dr Jennifer Tocher, who has supervised the accomplishment of this study and to Dr Sharon Levy who has helped me to sharpen the ideas in this paper. I also thank Dr Susanna Kean, who has supported me by sharing her expertise, knowledge, experience, and positivity to contribute to nursing through academic writing. This paper is based on and significantly expanded from author's dissertation at The University of Edinburgh.

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Cite this article as: Uligraff, D. K. (2019). Utilizing poetry to enhance student nurses' reflective skills: A literature review. *Belitung Nursing Journal, 5*(1), 3-8. https://doi.org/10.33546/bnj.631

Yuliandari, K. P. (2019). *Belitung Nursing Journal*. *5(1): 9-15*
https://belitungraya.org/BRP/index.php/bnj/index

BNJ BELITUNG NURSING JOURNAL

REVIEW ARTICLE

A LITERATURE REVIEW IN TRIAGE DECISION MAKING: SUPPORTING NOVICE NURSES IN DEVELOPING THEIR EXPERTISE

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Article Info:
Received: 10 October 2018
Revised: 8 November 2018
Accepted: 5 December 2018

DOI:
https://doi.org/10.33546/bnj.635

Abstract

Emergency nurses often find themselves doing triage under time pressure and with only limited information, while the accuracy and rapidity of triage assessment may well determine a patient's safety. A question may emerge as to whether novice nurses, who may have lack of experience and knowledge, could deal with such a demanding practice. In response to this, equipping novice nurses with important aspects in triage decision-making processes is pivotal. The aim of this literature review is to identify elements that could be utilised as supports for novice nurses in developing their expertise of making decision in triage. This study employed CINAHL, ScienceDirect, and PsycINFO to find relevant articles, using search terms "triage", "decision-making", "clinical decision-making", combined with "expert", and "novice". The publication dates of those articles ranged from 1990 to 2015. 1487 articles was found and sorted based on inclusion and exclusion criteria, resulting in seventeen articles that had been used in this study. Literature review suggests four important elements for developing novices' expertise in triage decision making: understanding the difference of novices' and experts' performance, critical analysis on theoretical approaches of clinical decision-making processes, defining factors that may influence nurses' triage decision making, and using appropriate learning strategies.

KEYWORDS
triage decision making; novices' decision making; experts' decision making

ISSN: 2477-4073

INTRODUCTION

Overcrowding in hospital emergency departments has been a challenge for nurses who are trying to provide a high quality of care for patients (Noon, 2014). To face this challenge, the sorting of patients is important (Marsden, 2008). The sorting of patients based on their acuity and the decision that prioritises one patient over another is defined as triage (Marsden, 2008), while the process of assessing patients to make a triage decision is called triage decision making.

Emergency nurses often find themselves doing triage under time preessure and with only limited information (Reay & Rankin, 2013). For example, nurses should determine patient's acuity in no more than twenty minutes and also make a justifiable referral in a short time, as there are likely to be many patients waiting to be seen and triaged. Therefore, identifying an effective clinical decision making process in triage is a considerable aspect in promoting patient safety. Since the accuracy and rapidity of triage assessment may well determine a patient's safety (Cioffi, 1998), a question may emerge as to whether novice nurses, who may have lack of experience and knowlegde, could deal with such a demanding practice.

A novice is not only defined as a person who does not have experience, but it can also be a person who has years of experience in a particular area, yet become novice again when she/he encounters a completely different area and different level

of knowledge (Benner, 1984). In other words, the concept of novice is context specific. Identifying elements that may assist novice nurses in dealing with high demand areas of practice, such as acute or emergency care is imperative since the number of expert nurses may well decrease as they reach retirement age (Ebright et al., 2004). To support novices in learning triage decision making processes, the possible attempts are to equip them with important elements in triage decision making, so that they may critically look at that elements and find attempts to develop their expertise. The aim of this study was to identify and to discuss important elements that can be utilised as supports for novice nurses for developing their expertise in triage decision making.

DATA SOURCES

This was a literature review focused on triage decision making done by nurses. CINAHL, Science Direct, and PsycINFO had been utilised to find relevant articles around triage decision making. The article used in this study had to be published between 1990 – 2015, English language articles, articles from other discipline such as medicine and psychology that specifically discussed decision making, and articles that contain relevant theoretical framework for triage decision making or clinical decision making in general. The exclusion criteria applied in this study is article that discusses 'Triage' term in non-medical and/or non-nursing discipline.

1487 articles had been found using search terms "triage", "decision making", "clinical decision making", combined with "expert" and "novice". The duplicate were removed, and the articles had further been selected by reading them and sorting them based on the inclusion and exclusion criteria, resulting in seventeen articles that had been reviewed in this study. In addition, outdated literatures that provides relevant theoretical foundation had been used in this study. For example, article from Benner and Tanner (1987) that discusses about how expert and novice using intuition in clinical decision making.

FINDINGS

Most of the articles that met inclusion and exclusion criteria and had been used in this review are exploratory research, either quantitative and qualitative study. The rest are review articles from Noon Noon (2014), Smith et al. Smith et al. (2013), and theoretical critique (Standing, 2008). Four key findings of this review were: understanding novice and expert's performance, critical analysis on theoretical approaches of clinical decision making processes, defining factors that may influence nurses' triage decision making, and utilising appropriate triage learning strategies.

Clinical decision making by experts and novices: the differences

The difference between novices' and experts' or experienced nurses' performance in triage decision making is essentials to gain understanding the strength and weakness of both performance. Schubert et al. Schubert et al. (2013) argued that by learning the differences between novices and experts is necessary to develop effective instructional modalities that can help in speeding up the learning process of inexperienced physicians especially those who work in high complexity environments.

A qualitative exploration by Schubert et al. (2013) demonstrated that expet clinicians were identified as using macro cognition, in which they regard several factors such as new information, environment, and organisational factors embeded in the clinical decision making process. In contrast, novices may use micro cognition, which largely relies on objective data (Schubert et al., 2013).

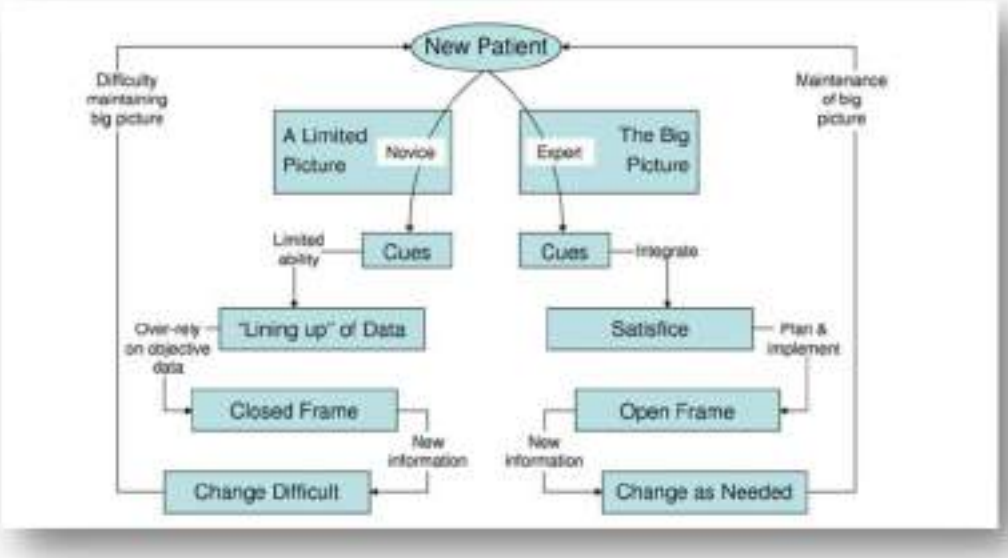

Figure 1 Novice-Expert Differences in Clinical Decision Making (Schubert et al., 2013)

Some researchers argue that experts can and do perform clinical decision making more effectively than novices. As novices have less years of experience in particular areas and may have not done sufficient preparation, they may be prone to make errors (Saintsing et al., 2011). Aligned with this argument, a study conducted by Martins et al. (2012) demonstrated that clinicians, who have less than ten year experience, seem to make more errors than those who have greater experience. It may be because more experienced nurses may have developed a heightened sense of awareness (Benner, 1984), and have collected more cues than novices (Hoffman et al., 2009). Furthermore, the experienced nurses seem to be more proactive in using these cues to perform clinical decision making skills (Hoffman et al., 2009). Therefore, experts' decision may be more accurate than novices'.

In addition, Cioffi (1998) demonstrated that experienced nurses were more definite and immediate in their decision regarding particular cases and defining clinical judgements although novices seem to collect more information. For example, if novices consentrate their minds in learning how to assess pain, they might collect more information about pain. However, they might not notice that the patient they are assessing is having abnormal pulse rhythm. Thus, may lead to losing the 'big picture' of patient's condition (Ebright et al., 2004) which, in turn, may reduce their clinical decision making accuracy. This is align with Cone's finding where expert nurses have higher mean scores on triage decision making ability than novices (Cone, 2000).

Critical analysis on theoretical approaches of clinical decision making processes

Triage was firstly performed by Baron dominique Jean Larre in 1840 (Fry & Burr, 2002), who prioritised medical needs of the military in Napoleonic War (Marsden, 2008). Since the late 1970 and early 1980 this strategy has been developing in hospital emergency departments worldwide (Fry & Burr, 2002). An overview of triage process is presented in **Table 1**.

Table 1 Triage Roles (Fry & Burr, 2002)

Triage Roles
1. Investigation of patient's condition (pysiological examination, gathering subjective data)
2. Code allocation (validating data, making judgement, determining severity, prioritize a patient over another)
3. Referral (to home/hospital/other health services)
4. Treatment (determining treatment based on patient's severity)
5. Non-patient tasks (communication, administration)

Triage is conducted via both structured and unstructured methods (Smith, 2013) since there are triage protocols and triage acuity scale that may help nurses in making triage decision. The triage protocols are present to aid prioritisation and rapid process of information and pattern recognition, which could be either minimally structured and unstructured (Marsden, 2008), whereas the triage acuity scales aid triage nurses to prioritise patient's acuity. The most well accepted triage acuity scales are Manchester Triage System, the Australasian Triage Scale, Canada Triage and Acuity Scale, and the emergency Severity Index Triage Scale (Marsden, 2008). It could be asked that how triage nurses implement those protocols/scales in triage decision making? When triaging, nurses generate assessment results and other factors into judgement and decision.

It is important that triage nurses should have the ability to determine whether they face a static or dynamic situation when generating their judgement into a decision (Noon, 2014). Nurses often face a dynamic situation while triaging (Noon, 2014); for example, a patient complaining dyspnea and chest pain may be more prioritized than a patient suffering abdominal pain and nausea. However, if the patient with chest pain had not presented, then the prioritization may be different (Noon, 2014). In such a dynamic situation, the type of judgement can be a dynamic judgement, where its goal is predicting the possible changes (Maule, 2001). Thus, Noon (2014) suggested that assessing theoretical arguments of clinical judgement and decision making which may be adopted in triage decision making is important. Several decision making theories has been assessed and presented as follows:

Hypothetico-deductive model

Göransson et al. (2008) conducted a study which demonstrated that registered nurses who work in emergency departments (n=16) adopt several thinking strategies which correspond with a hypothetico-deductive approach, which was defined by Elstein and Schwarz (2002). This approach is focused on information processing sequences (**Table 2**).

Table 2 Hyopthetico-deductive model (Elstein & Schwarz, 2002)

Hyopthetico-deductive model
1. Cue acquisition
2. Hypothesis generation, based on gathered data
3. Cue interpretation, choosing one alternative based on evidence

The hypothetico-deductive approach in triage decision making was found to be done by all participants, regardless of their years of experience in practice (Göransson et al., 2008). The participants did all the sequences presented in **Table 2**. However, this study was not conducted in an actual triage situation and using case-based scenarios instead. Therefore, the actual triage in emergency department where the situation is dynamic may not be depicted clearly by those scenarios. Paley (2006) argued that such an approach seems to be unrealistic to be implemented in real life decision making.

Dual system theory of clinical decision making

Croskerry (2009) assessed the dual process theory of clinical decision making, which has been identified as System 1 and System 2. System 1 represents intuitive decision making, which is fast and highly automatic, and the typical of decision done by experts (Croskerry & Nimmo, 2011). System 2 represents an analytical process which is slower but highly consistent (Croskerry & Nimmo, 2011) in which novices have been identified using this strategy (Benner & Tanner, 1987). Intuition is defined as "understanding without a rationale" (Benner & Tanner, 1987), whereas the analytical process involves deliberation and data analysis (Croskerry, 2009).

The use of triage protocols and scale may assist decision-making in System 2. Most errors identified as cognitive biases (Croskerry, 2006), occurs in System 1 as the consequences of the human tendency to have prejudice (Croskerry, 2009). Intuition has also been reported to be adopted by triage nurses despite utilizing triage protocols and physiologic data (Ek & Svedlund, 2015; Wolf, 2010). As triage should be implemented in a very short time, expert nurses may benefit from using intuition, since they may have recognized what would happen to patients, even if they had not exhibited signs and symptoms causing concern (Benner, 1984).

But what if novices followed their intuition? Some researchers argue it could be harmful if done by novices since they may lacking in experience and knowledge (Croskerry, 2006) and may not have sufficient knowledge to weigh the cues being presented (Thompson & Dowding, 2002). Therefore, the relevance of System 2 could not be disregarded, since it provides analytical deliberation towards a decision, therefore it may help to reduce errors (Croskerry, 2006). However, using analytical way in every triage process may be time consuming, while triage should be done in a very limited time (Reay & Rankin, 2015). Therefore, it is important to note that nurses should be aware of when exactly they could adopt intuitive and analytic decision-making. Croskerry (2013a) suggests that habitual reflection and analysis towards clinicians' decision making may help experts to gain insight and analyze their decision. It may also encourage novices to learn decision-making process in triage.

The cognitive continuum theory

Triage may be done in a poorly structured task, with low control over the variables such as signs, symptoms, time, and professional capability (Noon, 2014). On the other hand, evidence-based practice has been adopted in triage decision-making, such as the utilization of triage protocols and triage acuity scale. Therefore, the cognitive continuum and its revision by Standing (2008) may contribute to nurses' understanding towards triage decision making.

This theory looks at decision situation with range from poorly structured tasks to highly structured tasks, included further cognitive process between these two (see **Figure 2**). For example, a reflective judgment may be done by nurses in order to gain insight over their previous experiences and decisions, so that they could analyze what may be wrong or right and prepare for better practice (Standing, 2008). Moreover, a system aided judgment may represent the use of the triage protocols in gathering data to be generated to judgment and triage decision (Noon, 2014).

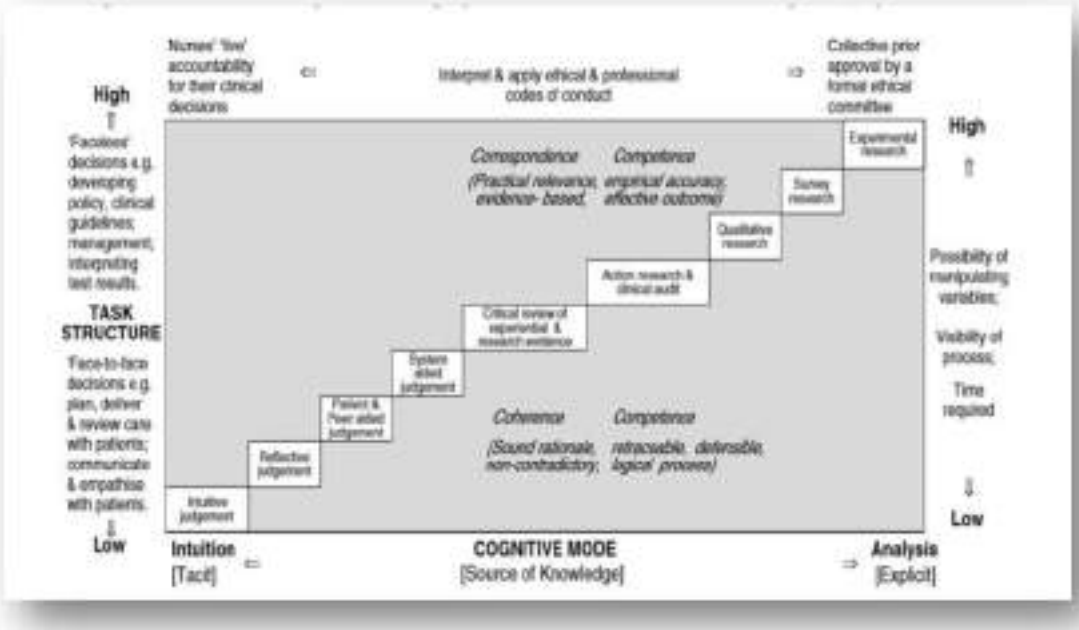

Figure 2 Standing's revised continuum theory (Standing, 2008)

Gerdtz and Bucknall (1999) suggested that the adaptation of research evidence in triage decision making is imperative since triage nurses often have to make autonomous decisions. As an example of autonomous decision, triage nurses work in separate room, determine patient's acuity by themselves, and have autonomy to make referral. Such responsibilities require triage nurses to adopt relevance evidence from nursing research in order to make them accountable (Gerdtz & Bucknall, 1999).

Factors that may influence nurses' triage decision-making

There are several factors that may influence nurses' triage decision-making as follow:

Knowledge and experience

Croskerry (2009) suggested that "all decisions are made in some sort of context", therefore clinicians' decision making may be influenced by such contextual factors. Gerdtz and Bucknall (2001) found several factors which significantly influenced the time-length of triage. These factors were categorized into: patient, nurse, and environmental factors. Looking specifically in nurses' factors, this study found that nurses used minimal objective data to determine level of urgency because physical assessment may increase time-length of triage (Gerdtz & Bucknall, 2001). A similar finding has previously been revealed by Salk et al. (1998) who found that nurses tended to use visual cues rather than vital signs during triaging. It seems that despite using triage assessment, nurses rely on their previous experience in assessing patients in order to reduce triage time-length.

Gerdtz and Bucknall (2001) demonstrated that nurses, who have more or longer experience need less time in assessing a patient than do nurses who have less experience in an emergency department; however, this result was not statistically significant (t=0.67, p=0.23). This result is similar with a previous study (Walsh, 1991) which demonstrated that years in practice had an insignificant influence on nurses' prioritization. Moreover, experienced nurses may vary in assigning standardized triage protocols (Fields et al., 2009), which could indicate that years in practice may have an inconsistent influence in nurses' triage accuracy (Dallaire et al., 2012; Parenti et al., 2006). Cioffi (1999) emphasized that relying solely on previous experience may lead to devaluing objective data and other explicit evidence.

Considine et al. (2007) suggested factual knowledge, which is identified as knowledge generated from fact, has greater impact on triage decision making than a nurse's years in practice. It means that nurses, who gain the whole picture of patient's actual condition, may perform more effective triage decision. However, the terms of factual knowledge and knowledge derived from experience are interlinked (Considine et al., 2007). It could be suggested that both knowledge and experience have an important role in clinical decision-making (Cioffi, 1999).

In addition, individual knowledge and experience embodied in personal capacity has been regarded as one of the most important components in triage decision making, since an advanced protocol may be meaningless if the individual does not have sufficient capacity to implement it (Andersson et al., 2006).

Environment, communication, and ethics

The other factor that has been identified as having influence on triage decisson-making is the work environment (Andersson et al., 2006; Gerdtz & Bucknall, 2001; Standing, 2008). For example, nurses regard the high workload in an emergency department as a factor that may negatively influence their triage accuracy. Moreover, time pressure was also reported to be negatively affecting nurses' decision performance (Ebright et al., 2004; Thompson et al., 2005).

Align with this, Wolf (2013) suggests a framework where integration between personal capacity, ethical consideration, and environment may influence nurses' triage decisions. Based on this framework, it seems that triage is not as simple as sorting patients based on their acuity, but it does involve those factors in decision-making process. As an example of interaction between these factors, nurses may lack confidence in their actions because they are concerned about being judged by patient or other nurses (Cioffi, 1998). This may lead them to make a safe decision, although it may not match with their clinical judgment (Ek & Svedlund, 2015).

Moreover, when nurses have to decide which patients might need immediate treatment in the emergency department, they need to communicate with patients or their family to gather subjective data. They must also be fully aware of the number of beds available and how many health personnel they can call upon. Therefore, communication between triage nurses and other staff in a hospital's emergency department should be established effectively (Epstein, 2013).

Utilizing appropriate learning strategies

Several strategies have been recommended by researchers in order to enhance clinical decision-making ability in nursing students and novices. Ebright et al. (2004) assessed that time pressure may negatively influence the quality of novices' decision making, since they might feel that they have no time to think of all they have to do. Therefore, experienced nurses need to educate novices in such situations, by mentoring or escorting novices when making a decision (Ebright et al., 2004). It is suggested that supervised practice by expert triage nurses may enhance novices' confidence and competence in triage decision making (Innes et al., 2011). Whenever possible, having a reflective session after the decision has been made is advantageous, in order to prevent biases and to justify and clarify the decision (Croskerry, 2013b; Schubert et al., 2013). It may also equip novices with a viable skill set for assessing and recognizing patient's conditions by reflecting upon their action (Bakalis & Watson, 2005), based upon the assumption that the expert nurses' abilities in triage decision making could be transferrable to novice recipients.

Other learning strategies suggested from the review is simulation (Cioffi, 1998; Schubert et al., 2013). Simulation may provide a 'real world' picture of triage. A study conducted

by Smith et al. (2013) indicated that the use of simulation could promote senior nursing students' confidence in performing triage decision making. However, the number of participants in this study was small (n=14) so that it could not be generalized. Wolf (2015) argued that observation towards actual triage decision making is more effective rather than adopting case studies. It can also be argued that simulation may be costly and cannot completely depict real triage practice in a dynamic emergency department.

In addition, Spivak et al. (2011) suggested that leadership in work may contribute to developing novices' expertise; for example, the sharing of encouragement and support from nurse leaders to other nurses may help the latter to deal with the complex transition process from novice to expert.

CONCLUSION

It can be seen that triage decision-making in an emergency department may not be as simple as sorting patients based on their acuity. Triage has been performed in conditions of extreme time pressure, high workload, and also in dynamic and complex situations. Nurses also have to perform effective communication with other team members in emergency department, considering resources availability, and their own personal capability. It can be a challenge for both novices and experts in dealing with such demands.

Understanding the difference between novices and experts performance may help novices to learn from both their strength and weaknesses. Several theoretical approaches may be considered to aid nurses to understand and perhaps enhance their triage decision-making abilities. It is important to note that the application of those theories may depend on their context and cannot be applied universally. Factors that may influence nurses' decision-making ability have also been addressed in this review. Novices should develop their sense of awareness towards those factors. Finally, recommended learning strategies that can be used to improve novices' triage decision-making ability have also been presented in this study.

Declaration of Conflicting Interests

This article is the author's original work, is not under consideration for publication elsewhere, and has not received prior publication. Its abstract had been published in the 3rd Asian Congress in Nursing Education's Book of Abstract. The author listed on title page declares that she has no conflict of interest. This article was originally made when the author doing Master courses, funded by Indonesia Endowment Fund for Education. Its content has been developed afterwards without third parties' funding.

Acknowledgment

The author would like to thank Professor Tonks Fawcett from the University of Edinburgh for her insights, comments, and expertise that greatly improved the manuscript. She is also grateful to School of Nursing Universitas Gadjah Mada for providing supports and opportunities in making this publication happens.

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Cite this article as: Yulandari, K. P. (2019). A literature review in triage decision making: Supporting novice nurses in developing their expertise. *Belitung Nursing Journal, 5*(1): 9-15. https://doi.org/10.33546/bnj.635

Ridad, G. S. (2019). *Belitung Nursing Journal*. 5(1): 16-22
https://belitungraya.org/BRP/index.php/bnj/index

BNJ BELITUNG NURSING JOURNAL

ORIGINAL RESEARCH

BARRIERS TO ADHERENCE TO EXPANDED PROGRAM ON IMMUNIZATION AMONG PARENTS IN LANAO DEL NORTE, PHILIPPINES

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Article Info:
Received: 3 December 2018
Revised: 7 January 2019
Accepted: 2 February 2019

DOI:
https://doi.org/10.33546/bnj.695

Abstract

Background: The Expanded Program on Immunization (EPI) was developed to ensure access of infant and children to recommended vaccines. In the Philippines, nurses are deployed in the community to ensure that children in their assigned units are fully immunized before they reach 1 year old. However, despite the various immunization campaigns, many children still remain unprotected and at-risk to life-threatening vaccine-preventable diseases. Thus, identifying the barriers that have averted parents from adhering to complete and timely immunization is important, most especially to nurses who are the primary program implementers in the community.

Objective: This study chiefly aimed to determine the respondents' perceived barriers along the aspects of Personal, Geographical and Social Barriers, Beliefs and Myths on Immunization, and Knowledge and Awareness on EPI and their relationship to the respondents' level of adherence to immunization.

Methods: Descriptive correlational design was used to explore the perceived barriers to immunization and examine its relationship to the respondents' level of adherence. A researcher-constructed questionnaire was used after being pilot tested to gather data from 352 random respondents.

Results: Using frequency counts, percentages, and weighted arithmetic mean, the results showed that most of the respondents considered only geographical factors as barrier along with social factors. Moreover, it has been found out that respondents lacked knowledge and awareness on the benefits of immunization, the number of vaccines their child needs to receive, site and schedule, side-effects, and contraindications. However, with mean above 2.34 indicated that respondents were informed on the appropriate interventions for side-effects of vaccines, as well as their right to refuse vaccination. The respondents' over-all level of adherence was moderate.

Conclusion: The identified barriers geographical, social, personal, beliefs and myths on immunization and respondents' level of knowledge and awareness have influenced respondents' level of adherence to a moderate level only. Based on the results, health care providers, especially nurses, and other concerned program implementers need to consider and address these barriers when formulating or improving strategies to increase immunization compliance. Lastly, more intentional follow-up campaign drives in spreading information about Expanded Program on Immunization using media and other ways is needed.

KEYWORDS
barriers to immunization; expanded program on immunization; adherence to immunization

ISSN: 2477-4073

INTRODUCTION

Every infant is entitled to the best possible protection against diseases. Obviously, they cannot take proper precautions, so family caregivers and health professionals must be responsible for them (Klossner & Hatfield, 2006). As vulnerable group, infants and newborns need to be vaccinated at an early age since their immune system is not yet mature making them more susceptible to childhood diseases (Ashwill & James, 2008; Cuevas, 2007).

Immunization, according to the World Health Organization (2013), is the process by which vaccines are introduced into the body before infection sets in. Vaccines are one of the most successful and cost-effective public health interventions that the government's health system can provide to the poor and most vulnerable populations (World Health Organization, 2013). The Expanded Program on Immunization shortly known as EPI was developed to ensure the access of infants and children to the recommended vaccines. To ensure that all children in the Philippines are Fully Immunized Child (FIC), the Department of Health utilized several strategies such as the Reaching Every Barangay (REB) strategy adapted from WHO-UNICEF's Reaching Every District (RED) strategy, Supplemental Immunization Activity (SIA) to reduce the rate of missed children or drop outs from routine immunization, and lastly through strengthened disease surveillance. In addition, Republic Act No. 10152 mandated that infants and children under 5 years old should receive basic immunization (Department of Health of the Republic of the Philippines, 2011).

In the Philippines, nurses are deployed in rural and urban health units as key implementers of these strategies to ensure that children in their assigned areas are fully immunized. However, despite these efforts many children still remain unprotected and at-risk to life-threatening vaccine-preventable diseases. In fact, The United Nations International Children's Emergency Fund (2018) reported an alarmingly low and declining immunization coverage rates in the Philippines, from 89% in 2013 to 62% in 2015. The report revealed that increased incidence of rubella in 2011 and measles in 2014 were attributed to low immunization rates (United Nations International Children's Emergency Fund, 2018). In Lanao del Norte, a number of barangays have been noted to have low compliance to EPI (Bacolod City Health Office, 2013; Municipal Health Center of Kolambugan, 2013; Municipal Health Center of Linamon, 2013).

To improve adherence and expand EPI coverage is the utmost goal of the program, thus,s identifying the specific factors that have averted parents from adhering to complete and timely immunization or the obstacles to immunizations inherent in a locality is important. Hence, this study chiefly aimed to determine the respondents' perceived barriers along the aspects of Personal, Geographical and Social Barriers, Beliefs and Myths on Immunization, and Knowledge and Awareness on EPI and their relationship to the respondents' level of adherence to immunization. Understanding and highlighting these barriers will guide the health care providers, especially community or public health nurses as the key and primary program implementers, in formulating better strategies to increase immunization compliance.

METHODS

Study design

This study employed non-experimental research design, using descriptive quantitative design to describe the variables of the study. Correlational design was also used to examine the relationship between the respondents' perceived barriers and their level of adherence to immunization.

Setting

This research was conducted in three (3) selected municipalities in Lanao del Norte, specifically, Linamon, Bacolod and Kolambugan. The researcher selected the top barangays of the respective municipalities with low compliance to EPI. This research was conducted between September – November 2013.

Samples

The respondents of the study were parents residing in the selected municipalities of Lanao del Norte with low compliance to EPI. They have child/children aging one to three (1-3) years old. The respondent was either the mother or the father whoever is available during the data gathering process. There were a total of 2900 households or families with child/children aging one to three (1-3) years old from all the three (3) selected municipalities; 791 households from Linamon; 533 families from Bacolod; and 1576 from Kolambugan (Bacolod City Health Office, 2013; Municipal Health Center of Kolambugan, 2013; Municipal Health Center of Linamon, 2013). Slovin's formula was used to calculate the appropriate sample size of 352 total respondents from all the three (3) municipalities. Proportional stratified random sampling method was then used in selecting the final number of respondents per municipality. The researcher gathered 96 respondents from Linamon, 65 respondents from Bacolod and 191 respondents from Kolambugan. The feasibility of the barangays was also considered, like transportation means and safety.

Instruments

A researcher-constructed questionnaire, based on related literature and studies, was used and served as the main instrument of the study. The sets of questionnaires were written in Cebuano and English. A pilot study was conducted to a smaller scale of respondents (10 respondents) with a questionnaire consisting of three parts. The first part is the Parent's Demographic Profile; the second part is the Barriers which include five subsets: (1) Personal, (2) Geographical, (3) Social Barriers to Immunization, (4) Beliefs and Myths on Immunization, (5) Knowledge and Awareness on the Adherence to EPI; and the third or last part comprises the Adherence of Parents towards EPI. The Cronbach's alpha ranges from 0.80-0.85 which indicates good level of internal consistency. The Personal, Geographical and Social Barriers, Beliefs and Myths on Immunization, as well as Adherence to

EPI were determined using a 4-point Likert Scale (1- Never, 2- Sometimes, 3- Often, 4- Always). The respondents' Knowledge and Awareness on EPI were determined using a 3-point Likert Scale (1- Undecided/ No Idea at all, 2- Disagree, 3- Agree).

Data analysis

Frequency counts and percentages were used to quantitatively describe the responses given by the respondents on the independent and dependent variables. The weighted arithmetic mean was used to determine the average value of the responses in each of the given questionnaire on the independent variables such as the barriers to adherence to immunization; and the dependent variable which is the adherence of parents to EPI. Pearson Product- Moment Correlation (Pearson r) was used to determine the degree or extent of correlation between respondent's perceived barriers: personal, geographical and social barriers, beliefs and myths on immunization, and knowledge and awareness on EPI towards their adherence to immunization. Lastly, T-test was used to determine if the Pearson's correlation is significant or not. The null hypothesis: there is no significant relationship between the identified barriers and their adherence to Expanded Program on Immunization (EPI) was tested at 0.05 level of significance.

Ethical consideration

The researcher ensured that ethical protocols were followed before and during the data gathering process. Data gathering started after the approval of College Research and Ethics Committee (CREC). Communication letters were given to each selected barangays and Municipal Health Office in the selected municipalities of Lanao del Norte. This study utilized respondents that were amenable to be part of the study after voluntarily signing the informed consent form given during orientation. The respondents were assured that the data collected will be treated with full confidentiality and that it cannot be disclosed elsewhere, except for the intended study and indeed will not be used against them.

RESULTS

Majority of the respondents (75.28%) were females or mothers. The male population was only 24.72%. All of them belonged to the reproductive age; most (46.31%) belonged to the age bracket of 21-30 years old while those parents who were 31-40 years old composed 36.93% of the total respondents' population.

Table 1 Respondents' Perception on Personal, Geographical, Social Barriers, Beliefs and Myths on Immunization as Barriers to their Adherence to EPI

Barriers to Adherence to EPI	Average Mean	Standard Deviation	Descriptive Rating
Personal Barriers	1.70	0.8625	Never
Geographical Barriers	2.07	0.9445	Sometimes
Social Barriers	1.81	0.8552	Sometimes
Beliefs and Myths on Immunization	1.68	0.9325	Never

Always 3.28-4.00 Often 2.52-3.27 Sometimes 1.76-2.51 Never 1.00-1.75

Table 1 above summarizes the barriers to respondents' adherence to EPI. Among all the identified barriers, only the geographical and social barriers were considered by the respondents as hindrance to their full adherence to EPI. Under the geographical barriers, respondents perceived the lack of security guards or any local authorities on health centers raises safety concerns. Some respondents were afraid of going anywhere far away from their home or to the rural health unit because of clan feuds. Other factors identified were distance of the health center from respondents' house, problems with transportation, and that health centers being non-operational or closed most of the times. Among all the social factors, the respondents perceived the unavailability or lack of vaccines, especially the Rotavirus vaccine, and lack of financial sources as barriers.

Although beliefs and myths on immunization was not perceived as a barrier by most of the respondents, few of them oftentimes believed that febrile child should not be immunized; a child may die due to immunization; and in what some elderly says that immunization is not effective since during their time it was not available yet they did not acquire life- threatening illnesses.

It is also important to take note that although the results revealed that majority never considered the issue of being guilty or ashamed going to the health center without money for donation as a personal barrier to their adherence, still few of the respondents were concerned on that aspect.

Table 2 shows that the respondents' lack knowledge and awareness on the benefits of immunization, number of vaccines, site and schedule, side-effects and contraindications of immunization is considered a barrier to their full adherence to EPI. On the other hand, they are informed and knowledgeable on the acceptability and interventions for the Side-effects of Immunization.

Table 2 Respondents' Knowledge and Awareness on EPI

Knowledge and Awareness on EPI	Average Mean	Standard Deviation	Descriptive Rating
Benefits of Immunization	2.01	0.9249	Disagree
Number of Vaccine, Site and Schedule of Immunization	2.20	0.8785	Disagree
Side-effects of Immunization	2.14	0.7633	Disagree
Contraindications of Immunization	1.92	0.7922	Disagree
Interventions for the Side-effects of Immunization	2.44	0.7680	Agree
Acceptability of Immunization	2.48	0.7820	Agree

Table 3 Summary of the Respondents' Level of Adherence to EPI

Indicators	Mean	Standard Deviation	Descriptive Rating
Geographical, Social and Personal Aspects	2.87	0.9286	Often
Knowledge and Awareness Aspects	2.85	1.0176	Often
Acceptability Aspects	2.80	0.9731	Often
Average	**2.84**	**0.9731**	**Often**

Always 3.28-4.00 Often/ Moderate 2.52-3.27 Sometimes/ Low 1.76-2.51 Never/ None 1.00-1.75

Table 3 portrays the respondents' level of adherence to EPI. The over-all mean of 2.84 means that the respondents' over-all level of adherence was moderate. This implies that most of the respondents' children have delayed or missed immunizations. Along the geographical, social, and personal aspects, most of the respondents' children were immunized in the health center regardless of completeness and timeliness and some often go to a private clinic or doctor for their children's immunization. Under the acceptability aspect, survey revealed that not all of the respondents were willing to have their children immunized and health workers respected their decision. However, there were also few respondents that reported health workers being forceful and too persuasive. On the knowledge and awareness aspects, most of the respondents always bring their children's immunization record during each visit, many respondents have gaps or delays in their children's immunization, had their children fully immunized only after more than 1 year of age, and only a few children were immunized with Rotavirus.

Table 4 Relationship between Geographical, Social, Personal Barriers, Beliefs and Myths to Respondents' Level of Adherence to EPI

Barriers		Adherence		
		Geographical, Social, and Personal aspects	Acceptability aspects	Knowledge and Awareness aspects
Geographical	r	0.12	0.12	0.12
	t-test	0.26	0.26	0.26
	interpretation	significant	significant	significant
Social	r	0.13	0.13	0.13
	t-test	2.45	2.45	2.45
	interpretation	significant	significant	significant
Personal	r	0.14	0.14	0.14
	t-test	2.65	2.65	2.65
	interpretation	significant	significant	significant
Beliefs and Myths	r	0.13	0.13	0.13
	t-test	2.45	2.45	2.45
	interpretation	significant	significant	significant

Level of Significance: 0.05 Critical Value: 1.98

As revealed on **Table 4**, the geographical, social, personal barriers, as well as the beliefs and myths were significantly related to respondents' level of adherence to EPI. This was because the r values ranged from very low to low correlation and; when tested at 0.05 level of significance, the t-test values obtained were greater than the critical value of 1.98. This implies that the extent or level of respondents' adherence to EPI

was affected by geographical, social, and personal barriers; as well as beliefs and myths of respondents on immunization.

As reflected on **Table 5**, the respondents' knowledge and awareness on EPI were significantly related to their level of adherence along the aspects of geographical, social, and personal; acceptability; and knowledge and awareness. Their lack of knowledge and awareness on EPI has influenced their level of adherence to a moderate level.

Table 5 Relationship between Respondents' Knowledge and Awareness on EPI to their Level of Adherence

Knowledge and Awareness on EPI	Adherence								
	Geographical, Social, and Personal aspects			Acceptability aspects			Knowledge and Awareness aspects		
	r	t-test	interpretation	r	t-test	interpretation	r	t-test	interpretation
Benefits	0.17	3.23	significant	0.12	2.26	significant	0.13	2.45	significant
Number of Vaccines	0.12	2.26	significant	0.12	2.26	significant	0.12	2.26	significant
Side-effects	0.12	2.26	significant	0.12	2.26	significant	0.12	2.26	significant
Contraindications	0.13	2.45	significant	0.13	2.45	significant	0.13	2.45	significant
Intervention	0.11	2.07	significant	0.11	2.07	significant	0.11	2.07	significant
Acceptability	0.11	2.07	significant	0.11	2.07	significant	0.11	2.07	significant

Level of Significance: 0.05 Critical Value: 1.98

DISCUSSION

In this study, only the geographical and social factors were perceived by the respondents as barriers to their full adherence to EPI. However, all the four barriers: Geographical, Social, Personal, as well as the beliefs and myths on immunization were significantly related to respondents' level of adherence to EPI. Under the geographical barriers, respondents perceived the lack of security guards or any local authorities on health centers raises safety concerns. Some respondents were afraid of going anywhere far away from their home or to the rural health unit because of clan feuds. In the complex web of violence in Mindanao, people were more concerned on the prevalence of clan feuds or "*rido*". In fact, Lanao del Norte is one of the top four provinces with the highest number of rido incidence (Torres, 2014). Another study affirms that lower levels of full age-appropriate immunization were found in children in whom the regular EPI schedule could likely not be followed due to specific war-related events impacting on the community. Such delays or misses in immunization represent an additional threat to children living in conflict areas (Senessie et al., 2007). Other factors identified were distance of the health center from respondents' house, problems with transportation, and that health centers being non-operational or closed most of the times; leaving the respondents no other choice than to go to the Municipal Health Center, which is kilometers away from them, if they wanted to have their children immunized. According to previous study, distance discourages future attendance (Schwarz et al., 2009).

Among the social factors, the respondents considered the lack of Rotavirus vaccine stock in the health center as the major factor that hampered them to avail complete immunization. Rotavirus vaccination was included in the routine immunization since 2012 in accordance to Republic Act 10152 to solve the problem of infants and toddlers dying from most severe episodes of rotavirus infection (Department of Health of the Republic of the Philippines, 2012; Palangchao, 2013).

Most of the respondents never believed on beliefs and myths on immunization. This positive response can be attributed to the efforts of the barangay health workers, especially the community health nurses, who have pursued on —house-to-house‖ visitations in promoting the EPI in conformity to PD 996 and Republic Act 10152 (Department of Health of the Republic of the Philippines, 2012). Although beliefs and myths on immunization were not perceived as a barrier by most of the respondents, yet few still have misconceptions as mentioned above. This necessitates health teaching reinforcement. Vaccine myths influence parents' behavior and perception that vaccines are unsafe. It erodes confidence, causing them to refuse to have their children vaccinated (Qidwai et al., 2007).

Under Personal barriers, few of the respondents were concerned on the practice of giving donations in the health center. The need to protect one's pride and dignity is also affected by criticism from neighbors for seeking free services and by the type of reception clients are given at a health care facility. The long waits, the impersonal and sometimes disrespectful treatment from insensitive staff, the patronizing attitude conveyed in many health education messages, can all lead clients to feel they have to pay an emotional price for health care (Coreil et al., 1994; Topuzoğlu et al., 2006).

The respondents' knowledge and awareness on immunization was also significantly related to their level of adherence. They are informed and knowledgeable on the acceptability and interventions for the Side-effects of Immunization. Health workers who educate parents on the side-effects and the corresponding suitable interventions would prevent panic, fear and confusion on the part of the parents and would promote independence (Centers for Disease Control and Prevention, 2013). The results of the study also indicate that respondents were aware of their right to refuse vaccination, however few reported that some health workers are being forceful and too persuasive. This implies the need of an in-depth study to explore this aspect of vaccination. Respecting a parent's decision with regards to immunization strengthens the bond of trust between provider and the parent (Gesmundo, 2010). However, strong objection of a parent against immunization perhaps indicate poor communication on the part of the health worker. Communication that is respectful, nonpatronizing, and nonconfrontational can help reassure parents and reduce vaccine hesitancy (Harrington, 2011).

Most of the respondents lack knowledge on the benefits of immunization, the number of vaccines, site and schedule, the side-effects, and contraindications of vaccines. This implies the need for exhaustive and clear education by health workers regarding immunization. Mothers who have less health education from caregivers are less likely to have fully immunized children (Tadesse et al., 2009). Bondy et al. recommends improvement of knowledge transfer to mothers to increase immunization coverage (Bondy et al., 2009). As primary source of information, nurses and other health workers need to know how to access appropriate, factual or research-based information when recommending various immunizations to parents (Ashville & James, 2008). Health workers frequently refuse to immunize children eligible to receive one or more immunizations, because of various fears and false beliefs -- that a sick child should not be vaccinated, that a child should not receive multiple vaccinations on the same visit, etc. This creates false contraindications causing delayed or missed immunization (World Health Organization, 2009).

CONCLUSION

The identified barriers geographical, social, personal, beliefs and myths on immunization, and level of knowledge and awareness have influenced respondents' level of adherence to a moderate level only. Based on the results, health care providers, especially the nurses who are the key implementers of EPI in the community, and other concerned program implementers need to consider and address these barriers when formulating or improving strategies to increase immunization compliance. Despite the current efforts and strategies employed by the Department of Health, these barriers still occur, which implies the need to review these programs as well as extensive monitoring and surveillance of under-immunized or non-immunized children especially in the far-flung or conflict-affected zones as well as non-operational health stations. This entails government support in terms of manpower and other resources, which needs to be looked into. An- in depth study is also recommended to determine the factors or reasons why some health workers were perceived as being too forceful and persuasive on vaccination. The results also imply community health nurses' commitment to continuing professional development through trainings and such in order to boost their confidence in giving health education and provide reliable information on EPI; as well as in dealing with parents' reluctance, myths and misconceptions on vaccination. Lastly, more intentional follow-up campaign drives in spreading information about Expanded Program on Immunization using media and other ways is needed.

Declaration of Conflicting Interest
None

Funding
Personally funded by the corresponding author.

Acknowledgment
The researcher gives back all the glory, praises and honor to the Almighty Father in Heaven. She would like to extend her deepest heartfelt gratitude to everyone who has in one way or another, contributed and extended their valuable assistance in the preparation and completion of the study; to her family, the faculty and staff of MSU-IIT College of Nursing and School of Graduate Studies in MSU-

Maravi, the barangay health workers of Linamon, Bacolod and Kolambugan. To Dr. Nur-Hannapha Derico, her adviser, who has provided her encouragement, guidance, and support from the very start 'til the very end. Lastly, to Dr Arlene A. Botones, for allocating portions of her precious time despite her busy schedule to entertain the author's concerns regarding the study, and for a very swift and efficient analysis and interpretation of this study's data that undeniably challenged and encouraged the researcher.

Author Contribution

This study is an original work of the corresponding author.

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Cite this article as: Ridad, G. S. (2019). Barriers to adherence to expanded program on immunization among parents in Lanao Del Norte, Philippines. *Belitung Nursing Journal, 5*(1): 16-22. https://doi.org/10.33546/bnj.695

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BNJ BELITUNG NURSING JOURNAL

ORIGINAL RESEARCH

THE RELATIONSHIP OF DEMOGRAPHIC AND ADMISSION EXAM SCORES WITH FIRST SEMESTER GRADE POINT AVERAGE IN TWO COHORTS OF FIRST YEAR NURSING STUDENTS

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Article Info:
Received: 10 October 2018
Revised: 9 November 2018
Accepted: 2 December 2018

DOI:
https://doi.org/10.33546/bnj.628

Abstract

Background: As nursing programs in Indonesia admit students, it is important that student factors are identified that provide information about necessary resources that are needed to support the student, both academically and psychosocially, to succeed in the nursing program.

Obejctive: The purpose of this study was to use regression analysis to analyze admission and academic data of two cohorts of nursing students to know what relationship that information has with first semester grade point average (GPA).

Methods: A descriptive correlation design was used. In a previous study with one cohort of nursing students, the researcher found that the variables accounted for only 28% of the variance. This research added the variable of age, increased the categories for region of origin from five to seven, increased the categories for type of high school from three to four, and analyzed the data from two cohorts. Data from 947 students were included for analysis. Mulivariate linear regression was used to analyze the variables of city of origin, attendance at pre-nursing course, gender, age, type of high school, and admission exam scores to determine the relationship, if any, between the first semester GPA of nursing students in a large university in an urban area of Indonesia.

Results: A significant relationship ($p<.05$) was found between experience factors, attribute factors, and academic metric factors and first semester GPA. For students admitted in 2016, the study variables accounted for 30% of the variance in GPA; for students admitted in 2017, the study variables accounted for 37% of the variance in GPA.

Conclusion: It is important that student factors are identified that provide information about succeeding in the nursing program, both academically and psychosocially. Additional research is needed to identify other admission factors and any factors in the first semester that may also have a relationship with GPA.

KEYWORDS
holistic admission model; GPA; nursing education

ISSN: 2477-4073

INTRODUCTION

There is a growing movement in healthcare education, including nursing, to have a holistic review admission process to develop a more diverse healthcare workforce (Scott & Zerwic, 2015). The goal of a diverse workforce in healthcare is to improve health, especially in underserved communities (Glazer et al., 2016). Holistic admission is a flexible, individualized way of assessing a potential student's capabilities to contribute value to a healthcare profession (American Association of Medical Colleges, 2013). Balanced consideration is given to examining factors of experience, attributes, and education metrics of the potential student (American Association of Medical Colleges, 2013). It is

important to ensure that students admitted will be able to complete the degree and provide safe quality patient care (Urban Universities for Health, 2014). To do so requires that faculty have the available resources that are necessary for the student's success (Glazer et al., 2016; Scott & Zerwic, 2015). It is important that nursing programs adequately prepare graduates to meet the demands for nursing, both in quantity and quality.

To facilitate student success in a nursing program, it is important that student factors are identified that provide information about necessary resources needed to support the student, both academically and psychosocially. In a previous study of one cohort of first year nursing students (Sommers & Park, 2017), the researcher noted that the study variables accounted for only 28% of the variance in grade point average (GPA). The researcher recommended that additional research be done with additional variables and with more than one cohort of first year nursing students. This current research added the variable of age, increased the categories in city of origin from five to seven, and increased the categories in type of high school from three to four. It also included two cohorts of first year nursing students.

The purpose of this study was to examine the association, if any, of experience factors (city of origin and attendance at pre-nursing course), attribute factors (gender and age), and academic metric factors (admission scores and type of high school) with the first semester GPA of first year nursing students from two cohorts of first year nursing students enrolled in a baccalaureate nursing program in Indonesia. The two cohorts were students admitted during August 2016 and those admitted during August 2017. First semester GPA was chosen as a determinant of success as it has been associated with successful completion of a nursing program (Newton & Moore, 2009). GPA is also a strong predictor of graduation (American Council on Education, 2016).

Theoretical framework

Scott and Zerwic (Scott & Zerwic, 2015) adapted the Association of American Medical Colleges (American Association of Medical Colleges, 2013) model of holistic admission for use in nursing. The model includes factors of experiences (i.e. experiences in life, communities, and healthcare; leadership opportunities; and culture/diversity), attributes (i.e. demographic characteristics, abilities, maturity, interests, and goals), and academic metrics (i.e. education background, GPA, standardized tests, and pre-admission test scores). Implementation of the model resulted in more diverse students being admitted.

As holistic admission is implemented in nursing programs, it will be important that academic success is monitored (Glazer et al., 2016). However, in nursing there is a lack of data on which factors of the student will best predict future success in nursing (Glazer et al., 2016). This study used a variation of the Scott and Zerwic (Scott & Zerwic, 2015) model of holistic admission for use in nursing as shown in **Figure 1**.

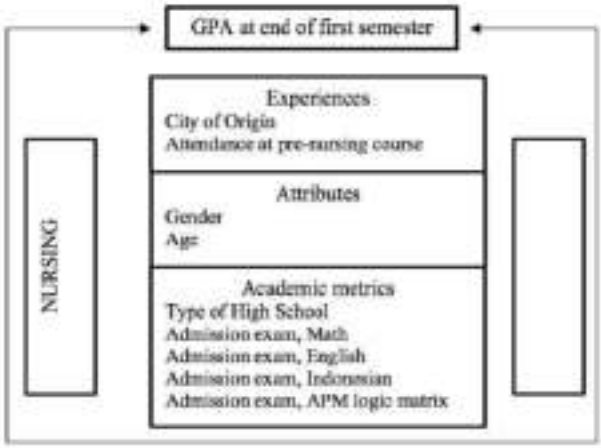

Figure 1 Adapted Holistic Admission Model

The variables of interest for this study was first semester grade point average (GPA), the experience factors of city of origin and attendance at pre-nursing course, the attribute factors of gender and age, and the academic metrics of type of high school attended and admission exam scores. Previous researchers have found a relationship between GPA in the first semester and completion of a nursing study program (Newton & Moore, 2009). The reliability of first semester GPA with other courses has been determined as .84 and is therefore a reliable indicator to measure the academic performance of students (Bacon & Bean, 2006).

The variables of city of origin and attendance at pre-nursing course were chosen as experience factors for this study. The island where the city of origin is located was divided into seven regions (see Table 1). The variable attendance at pre-nursing course was defined as attendance at a special, invitation-only extra-curricular course that is offered prior to the first semester. This course provides intense instruction in life skills, basic computer and math skills, and introduction to English. Previous researchers have found a weak association with region of origin/ethnicity and GPA in nursing students in New Zealand (Shulruf, Wang, Zhao, & Baker, 2011).

The variables of gender and age were chosen as attribute factors for this study. Gender was defined by the World Health Organization (World Health Organization, 2011) as socially constructed characteristics of women and men. Age was defined as the total number in years of the student on 1 August of the year the student was admitted to the nursing program. The author found in the previous study of one cohort of students that gender was associated with GPA (Sommers & Park, 2017). It is not known if there is any relationship with age and GPA.

Academic metrics included type of high school and admission exam scores in math, English, Indonesian, and a logic. The type of high school was defined as the classification of the high school program the student attended and was divided into four

categories (See **Table 1**). The author found in the previous study of one cohort of students that type of high school was associated with GPA (Sommers & Park, 2017). The exams for math, English, and Indonesian were developed by faculty at the university that taught those subjects. No reliability and validity studies have been conducted. The range of the math exam is 0-30 and tests basic math concepts. The range of the English exam is 0-50 and tests English reading ability and grammar. The range of the Indonesian exam is 0-40 and tests Indonesian reading ability and grammar. The logic exam is the language-free version of Raven's Advanced Progressive Matrices (APM) licensed by the University of Indonesia. The reliability of the exam for studies done in the United States was .85 (NCS Pearson Inc, 2011), indicating good reliability (Polit & Beck, 2017). Previous researchers have found an association with admission exam scores and GPA of first year nursing students (Shulruf et al., 2011; Underwood, Williams, Lee, & Brunnert, 2013).

METHODS

Study design and sample

This study was conducted at a large private baccalaureate nursing program in Lippo Karawaci, Indonesia between October 2017 to January 2018. A descriptive correlation design was used. A convenience sample of all students admitted to the nursing program in August 2016 and August 2017 was used. A data set was used that included admission and academic records of nursing students that were accepted in August 2016 and August 2017. A pilot study was not done. There were 510 nursing students admitted in August 2016 and 443 nursing students admitted in August 2017. Data related to demographic variables, admission exam scores, and first semester GPA was collected between August 2016-December 2016 and August-December 2017, respectively, to assist in providing and assessing details regarding the characteristics of the admission cohort and to evaluate the transition of the new students to FoN. This information is compiled every academic year as part of routine academic administration procedures. Each cohort was examined for relationship between GPA and study variables. The two cohorts were also combined and examined for a relationship between GPA and study variables.

Ethical consideration

Approval for the study was given from Mochtar Riady Institute for Nanotechnology Ethics Committee, Protocol Number: 04.1709180. After ethical approval was obtained, a de-identified data set was created from the academic records of the two cohorts that contained only the dependent variable of first semester GPA and the independent variables of city of origin, attendance at pre-nursing course, gender, age type of high school, math admission exam score, English admission exam score, Indonesian admission exam score, and Raven's Advanced Progressive Matrices (APM) logic matrix exam score. The privacy of students was protected as all data was de-identified in the database and there was not any student identifying information. All data in the de-identified database was kept confidential and stored on secured servers that were only accessed from password protected computers.

Data analysis

Data were analyzed in SPSS using regression analysis to determine what relationship, if any, the experience, attribute, and academic metrics have with first semester GPA in nursing students from two cohorts that were admitted in August 2016 and August 2017. Data from each cohort was analyzed separately and then also combined. The level of significance was set at .05. Descriptive statistical analysis was used to describe the characteristics of the data and included means and standard deviations for continuous variables and frequency distributions and percentages for categorical variables. Multivariate linear regression was used to determine the relationships between the variables and the first semester GPA.

Prior to conducting the regression, the data were explored for missing data, unusual values, outliers, and whether the data meets the assumptions of linearity, normality, non-multicollinearity, homoscedasticity, and independence. Four of the students in Cohort 2016 had missing data for GPA and two of the students in Cohort 2017 had missing data for GPA. There was no data about the GPA because the students did not complete the first semester. Since the missing data is small (less than 1%), listwise deletion was used, and it is acknowledged that there was a small potential for bias by doing so (Parent, 2013). After listwise deletion, the remaining data for each cohort (Cohort 2016 N = 506; Cohort 2017 N = 441) and combined cohorts (N = 947) was examined for linearity was examined by evaluating the partial plots for the independent variables and the correlations between the independent variables and the first semester GPA. This assumption was met as the partial plot had a linear relationship with all the data points near the line. None of the independent variables had a high correlation with the dependent variable of GPA. Testing for normality was done by examining the residual histogram for each cohort and for the combined data, which had an approximate normal curve. Testing for multicollinearity was done by evaluating the bivariate correlation matrix, tolerance value, variance inflation factors value, condition indices, and standardized residual values. There was no evidence of multicollinearity as the bivariate correlation matrix values are all below .50, the tolerance values were above .10, and the variance index factor values were below 10 (Kutner, Nachtsheim, & Neter, 2004). The condition indices were also below 30. Homoscedasticity was evaluated by reviewing the scatter plot and no clear pattern was seen. Independence was tested by evaluating the value for Durban Watson, which was 1.78 (Cohort 2016), 1.9 (Cohort 2017), and 2.04 (Combined) respectively which is within the recommend values of 1.5 to 2.5 (Lester, Inman, & Bishop, 2014).

RESULTS

Characteristics of the final samples are displayed in **Table 1**. The mean GPA of Cohort 2016 was 3.03 (SD = 0.25), Cohort 2017 was 3.19 (SD = 0.25), and combined was 3.10 (SD = 0.2).

Most of the participants in cohort 2016 were from the island of Sumatra (n = 161, 31.8%) and did not attend the pre-nursing course (n = 394, 77.9%). Most of the participants in cohort 2017 were from the island of Java (n = 137, 31.1%), followed closely by the island of Sumatra (n = 136, 30.8%), and did not attend the pre-nursing course (n = 362, 82.1%). In Cohort 2016, there were 401 females (79.2%) and 105 males (20.8%); In Cohort 2017 there were 358 females (81.2%) and 83 males (19.8%). The means of the admission exams for Cohort 2016 were: math 10.17 (SD = 3.91), English 19.93 (SD = 5.36), Indonesian 17.23 (SD = 3.60), and APM 21.55 (SD = 3.55). The means of the admission exams for Cohort 2017 were: math 10.70 (SD = 3.17), English 23.18 (SD = 6.88), Indonesian 24.01 (SD = 3.52), and APM 21.86 (SD = 3.69). For both groups, most participants attended a health/science focused high school (Cohort 2016, n = 402, 79.4%; Cohort 2017, n = 335, 76.0%).

Table 1 Characteristics of the sample

Variable Mean (SD)	Cohort 2016 (N=506)	Cohort 2017 (N=441)	Combined (N=947)
Age	17.82 (0.78)	17.76 (0.79)	17.79 (0.78)
Admission Exam Scores (possible range)			
Math admission exam score (0-30)	10.17 (3.91)	10.70 (3.17)	10.42 (3.60)
English admission exam score (0-50)	19.93 (5.36)	23.18 (6.88)	21.44 (6.33)
Indonesian admission exam score (0-40)	17.23 (3.60)	24.01 (3.52)	20.38 (4.91)
*APM admission exam score (0-36)	21.55 (3.55)	21.86 (3.69)	21.69 (3.62)
***GPA (0.00-4.00)**	3.03 (0.25)	3.19 (0.26)	3.10 (0.27)
Region of Origin *n* (%)[a]			
Sumatra Island (reference group)	161 (31.8)	136 (30.8)	297 (31.4)
Java Island	106 (20.9)	137 (31.1)	243 (25.7)
Kalimantan Island	41 (8.1)	20 (4.5)	61 (6.4)
Sulawesi Island	94 (18.6)	49 (11.1)	143 (15.1)
Papua Island	28 (5.5)	33 (7.5)	61 (6.4)
Maluku Islands	37 (7.3)	30 (6.8)	61 (7.1)
Bali and Nusa Tenggar Islands	39 (7.7)	36 (8.2)	75 (7.9)
Attendance at pre-nursing course			
No (reference group)	394 (77.9)	362 (82.1)	756 (79.8)
Yes	112 (22.1)	79 (17.9)	191 (20.2)
Gender			
Female (reference group)	401 (79.2)	358 (81.2)	759 (80.1)
Male	105 (20.8)	83 (18.8)	188 (19.9)
Type of High School [b]			
Health/Science High School (reference group)	402 (79.4)	335 (76.0)	737 (77.8)
Social Science High School	40 (7.9)	33 (7.5)	73 (7.7)
Health/Science Vocational School	42 (8.3)	48 (10.9)	90 (9.5)
Social Science Vocational School	22 (4.3)	25 (5.7)	47 (5.0)

[a]5 regions used in previous study: Sumatra island, Java and Bali islands, Sulawesi island, Kalimantan island, Eastern islands

[b]3 types of high school used in previous study: Science high school, Health/science vocational school, Social science vocational or high school

*APM = Raven's Advanced Progressive Matrices

*GPA = Grade Point Average

Blockwise multivariate linear regression was done to determine the relationship between GPA and independent variables. In a previous study using Cohort 2016 (Sommers & Park, 2017) a two-block model with two steps: (1) attribute and experience factors of gender, region of origin, and attendance at pre-nursing course and (2) academic metric factors of admission exam scores and type of high school had an identical end model summary as a three-block model with three steps: (1) attribute factors of gender, (2) experience factors of region of origin and attendance at pre-nursing course, and (3) academic metric factors of admission exam scores and type of high school. As the end model summary was the same, the study used a two-block model. In the current study, the two-block model with two steps (1) attribute and experience factors of age, region of origin, and attendance at pre-nursing course and (2) academic metric factors of admission exam scores and type of high school also had an identical end summary compared to a three-block model for Cohort 2016, Cohort 2017 and the Combined sample. Thus, the two-block model which included both attribute and experience factors in the first block, was chosen and reported in this study (see **Table 2**).

Table 2 Two-block multivariate linear regression model of variables

Cohort 2016 Two-block Model Summary									
Step	R	R^2	Adjusted R^2	R^2 Change	F Change	df1	df2	Significant F Change	Durbin-Watson
1	0.26	0.07	0.05	0.07	3.94	9.00	496.00	0.00	
2	0.54	0.30	0.27	0.23	22.80	7.00	489.00	0.00	1.78
Cohort 2017 Two-block Model Summary									
Step	R	R^2	Adjusted R^2	R^2 Change	F Change	df1	df2	Significant F Change	Durbin-Watson
1	0.22	0.05	0.03	0.05	2.43	9.00	431.00	0.01	
2	0.60	0.37	0.34	0.32	30.23	7.00	424.00	0.00	1.89
Combined Two-block Model Summary									
Step	R	R^2	Adjusted R^2	R^2 Change	F Change	df1	df2	Significant F Change	Durbin-Watson
1	0.21	0.05	0.04	0.05	4.93	9.00	937.00	0.00	
2	0.61	0.38	0.37	0.33	70.61	7.00	930.00	0.00	2.04

Step 1 variables: gender, region of origin, attendance at pre-nursing course
Step 2 variables: admission exam scores, type of high school

For Cohort 2016, the multiple correlation coefficient R was .54 for the final model. As the possible range for R is 0 to 1, an R of .54 indicates a moderate association between the independent variables and GPA (Polit & Beck, 2017). The R^2 was .30, indicating that about 30% of the variance in GPA is accounted for by all the independent variables in this study, while only 5% of the variance was explained by attribute and experience factors. The R^2 improved by .23 by adding the academic metric factor variables of admission exam scores and type of high school to the model. This linear combination of independent variables was significantly associated with GPA, $F(7, 489) = 22.80$, $p < .001$.

For Cohort 2017, the multiple correlation coefficient R was .60 for the final model. As the possible range for R is 0 to 1, an R of .60 indicates a moderate association between the independent variables and GPA (Polit & Beck, 2017). The R^2 was .37, indicating that about 37% of the variance in GPA is accounted for by all the independent variables in this study, while only 3% of the variance was explained by attribute and experience factors. The R^2 improved by .32 by adding the academic metric factor variables of admission exam scores and type of high school to the model. This linear combination of independent variables was significantly associated with GPA, $F(7, 424) = 30.23$, $p < .001$.

The multiple correlation coefficient R in the combined sample was .51 for the final model, indicating a moderate association between the independent variables and GPA (Polit & Beck, 2017). The R^2 was .38, indicating that about 38% of the variance in GPA is accounted for by all the independent variables in this study, while only 4% of the variance was explained by attribute and experience factors. The R^2 improved by .37 by adding the academic metric factor variables of admission exam scores and type of high school to the model. This linear combination of independent variables was significantly associated with GPA, $F(7, 930) = 40.61$, $p < .001$.

Based on analysis of the beta coefficients, several independent variables were associated with GPA (see Table 3, regression table). For Cohort 2016, when individual variables using standardized beta scores were examined, the score on the English admission exam ($B = .01$, $p < .001$, $\beta = .26$) explained the most variance in GPA, followed by the score on the Indonesian admission exam ($B = .01$, $p < .001$, $\beta = .21$), type of high school, social science focused high school when compared to health/science focused high school ($B = -.14$, $p < .001$, $\beta = -.15$), score on the APM admission exam ($B = .01$, $p = .001$, $\beta = .13$), gender, male when compared to female ($B = -.07$, $p = .004$, $\beta = -.11$), score on the math admission exam ($B = .01$, $p = .017$, $\beta = .10$), and region of origin, Papua island when compared to Sumatra island ($B = -.10$, $p = .032$, $\beta = -.09$). There was no significant relationship between attendance at the pre-nursing course ($B = -.01$, $p = .763$, $\beta = -.01$) or age ($B = -.02$, $p = .252$, $\beta = -.05$) and GPA.

For Cohort 2017, when individual variables using standardized beta scores were examined, the score on the English admission exam ($B = .01$, $p < .001$, $\beta = .28$) also explained the most variance in GPA, followed by the score on the Indonesian admission exam ($B = .02$, $p < .001$, $\beta = .26$), score on the math admission exam ($B = .02$, $p < .001$, $\beta = .22$), score on the APM admission exam ($B = .01$, $p = .001$, $\beta = .16$), attendance at pre-nursing course ($B = .09$, $p = .003$, $\beta = .13$), and type of high school, social science focused vocational school when compared to health/science focused high school ($B = -.11$, $p = .022$, $\beta = -.09$). There was no significant relationship between gender, male when compared to female ($B = .02$, $p = .523$, $\beta = .03$), age ($B = -.01$, $p = .388$, $\beta = -.04$), and any region of origin with GPA.

Table 3 Independent variables associated with GPA

Variable	B	SE B	95% CI for B		t	Sig.	β
			Lower	Upper			
Age							
Cohort 2016	-.02	.01	-.04	.01	-1.15	.252	-.05
Cohort 2017	-.01	.01	-.04	.02	-0.86	.388	-.04
Combined	-.01	.01	-.03	.01	-1.39	.164	-.04
Gender							
Cohort 2016	-.07	.02	-.12	-.02	-2.93	.004	-.11
Cohort 2017	.02	.03	-.04	.07	0.64	.523	.03
Combined	-.03	.02	-.06	.01	-1.59	.113	-.04
Attendance at Pre-nursing course							
Cohort 2016	-.01	.03	-.06	.04	-0.30	.763	-.01
Cohort 2017	.09	.03	.03	.15	2.95	.003	.13
Combined	.04	.02	.00	.07	1.91	.057	.05
Java Island (Dummy variable)							
Cohort 2016	-.05	.03	-.11	.00	-1.82	.069	-.08
Cohort 2017	.01	.03	-.05	.06	0.27	.787	.01
Combined	-.02	.02	-.06	.02	-1.17	.244	-.04
Kalimantan Island (Dummy variable)							
Cohort 2016	-.01	0.04	-.09	.06	-0.34	.732	-.01
Cohort 2017	.06	.05	-.04	.16	1.17	.242	.05
Combined	.02	.03	-.04	.08	0.58	.563	.02
Sulawesi Island (Dummy variable)							
Cohort 2016	-.04	.03	-.09	.02	-1.35	.176	-.06
Cohort 2017	.06	.04	-.01	.14	1.71	.089	.08
Combined	.00	.02	-.04	.05	0.07	.941	.00
Papua Island (Dummy variable)							
Cohort 2016	-.10	.04	-.18	-.01	-2.16	.032	-.09
Cohort 2017	-.08	.04	-.17	.01	-1.85	.064	-.08
Combined	-.08	.03	-.14	-.02	-2.55	.011	-.07
Maluku Islands (Dummy variable)							
Cohort 2016	-.02	.04	-.09	.06	-0.43	.670	-.02
Cohort 2017	.02	.05	-.07	.11	0.40	.690	.02
Combined	.00	.03	-.06	.06	0.09	.931	.00
Bali and Nusa Tenggar Islands (Dummy variable)							
Cohort 2016	.00	.04	-.07	.08	0.04	.967	.00
Cohort 2017	.00	.04	-.08	.08	0.05	.962	.00
Combined	.01	.03	-.04	.07	0.44	.662	.01
English Admission Exam Score							
Cohort 2016	.04	.00	.01	.02	5.65	.000	.26
Cohort 2017	.01	.00	.01	.01	6.11	.000	.28
Combined	.01	.00	.01	.01	8.81	.000	.27
Math Admission Exam Score							
Cohort 2016	.01	.00	.00	.01	2.10	.017	.11
Cohort 2017	.02	.00	.01	.03	5.25	.000	.22
Combined	.01	.00	.01	.02	5.05	.000	.15
Indonesian Admission Exam Score							
Cohort 2016	.01	.00	.01	.02	4.91	.000	.21
Cohort 2017	.02	.00	.01	.03	6.25	.000	.26
Combined	.02	.00	.01	.02	11.09	.000	.32
APM Admission Exam Score							
Cohort 2016	.01	.00	.00	.01	3.27	.001	.03
Cohort 2017	.01	.00	.01	.02	3.78	.000	.16
Combined	.01	.00	.01	.01	4.78	.000	.13

Social Science High School (Dummy variable)							
Cohort 2016	-.14	.04	-.21	-.07	-3.80	.000	-.15
Cohort 2017	-.06	.04	-.13	.03	-1.35	.178	-.05
Combined	-.10	.03	-.16	-.05	-3.79	.000	.10
Health/Science Vocational School (Dummy variable)							
Cohort 2016	-.01	.04	-.08	.06	-0.39	.700	-.02
Cohort 2017	.04	.04	-.03	.11	1.07	.283	.05
Combined	.01	.03	-.04	.06	0.41	.685	.01
Social Science Vocational School (Dummy variable)							
Cohort 2016	-.02	.05	-.11	.07	-0.45	.653	-.02
Cohort 2017	-.11	.05	-.20	-.02	-2.30	.022	-.09
Combined	-.07	.03	-.14	-.01	-2.12	.034	-.06

Note. CI = Confidence Interval; Sig. = t test significance

When individual variables using standardized beta scores were examined for the combined sample, the score on the Indonesian admission exam (B = .02, p < .001, β = .32) explained the most variance in GPA, followed by the score on the English admission exam (B = .01, p < .001, β = .27), score on the math admission exam (B = .01, p < .001, β = .15), score on the APM admission exam (B = .01, p < .001, β = .13), type of high school, social science focused high school when compared to health/science focused high school (B = -.10, p < .001, β = -.10), region of origin, Papua island when compared to Sumatra island (B = -.08, p = .011, β = .07), and type of high school, social science focused vocational school when compared to health/science focused high school (B = -.07, p = .034, β = -.06). There was no significant relationship between attendance at pre-nursing course (B = .04, p = .057, β = .05), gender, male when compared to female (B = -.03, p = .113, β = -.04), and age (B = -.01, p = .164, β = -.04) with GPA.

Controlling for all the other variables in Cohort 2016, when each of the English, Indonesian, APM, and math admission exam score was increased by one point, the GPA increased by .01 (English p < .001, 95% CI [0.01, 0.02]; Indonesian p < .001, 95% CI [0.01, 0.02]; APM p = .001, 95% CI [0.00, 0.01]; math p = .017, 95% CI [0.00, 0.01]). If the student attended a social science focused high school, the GPA was decreased by .14 (p < .001, 95% CI [-0.21, -0.07] compared to students that attended a health/science focused high school. Male students had a .07 (p = .002, 95% CI [-0.12, -0.03]) lower GPA compared to female students. Students from Papua Island had a .10 (p = .032, 95% CI [-0.18, -0.01]) lower GPA than students from Sumatra Island.

Controlling for all the other variables in Cohort 2017, when the English and APM admission exam score was increased by one point, the GPA increased by .01 (English p < .001, 95% CI [0.01, 0.01]; APM p < .001, 95% CI [0.01, 0.02]). When the Indonesian and math admission exam score was increased by one point, the GPA increased by .02 (Indonesian p < .001, 95% CI [0.01, 0.03]; math p < .001, 95% CI [0.01, 0.03]). If the student attended the pre-nursing course, the GPA was increased by .09 (p = .003, 95% CI [0.03, 0.15]). If the student attended a social science focused vocational school, the GPA was decreased by .11 (p = .022, 95% CI [-0.20, -0.02]) compared to students that attended a health/science focused high school.

For the combined sample, when controlling for all the other variables, when each of the English, APM, and math admission exam score was increased by one point, the GPA increased by .01 (English p < .001, 95% CI [0.01, 0.01]; APM p < .001, 95% CI [0.01, 0.01]; math p < .001, 95% CI [0.01, 0.02]). When the Indonesian admission exam score was increased by one point, the GPA increased by .02 (p < .001, 95% CI [0.01, 0.02]. If the student attended a social science focused high school, the GPA was decreased by .10 (p < .001, 95% CI [-0.16, -0.05]) and if attended a social science focused vocational school, the GPA decreased by .07 (p = .034, 95% CI [-0.14, -0.01]) compared to students that attended a health/science focused high school. Students from Papua Island had a .08 (p = .011, 95% CI [-0.14, -0.02]) lower GPA than students from Sumatra Island.

The zero-order, partial, and part correlation coefficients were examined to determine if any of the independent variables had a suppression effect. For some of the variables in each sample, the sign of the zero-order correlation and B coefficient were opposite, which suggests the possibility of some suppression in the model. However, as there is not a decrease in R^2 with their inclusion in the model in each of the samples, the possible suppression effect is minimal.

DISCUSSIONS

This study examined what experience factors (region of origin and attendance at pre-nursing course), attribute factors (gender and age), and academic metric factors (admission exam scores and type of high school) are associated with the first semester GPA of first year nursing students enrolled in a baccalaureate nursing program in Indonesia. These variables accounted for 30% (Cohort 2016), 37% (Cohort 2017), and 38% (Combined) in the variance of first semester GPA. This is a slight improvement from the model that was used in a previous study with Cohort 2016 where the variables accounted for only 28% of the variance (Sommers & Park, 2017). A significant relationship (p < .05) was found between admission exam

scores and type of high school with first semester GPA in students admitted in 2016 and 2017 and in the combined sample. In addition, for Cohort 2016, a significant relationship ($p < .05$) was also found between gender and region of origin and first semester GPA. For Cohort 2017, there was also a significant relationship ($p < .05$) found between attendance at pre-nursing and first semester GPA. The combined sample also had a significant relationship ($p < .05$) between region of origin and first semester GPA. None of the groups had a significant relationship between age and first semester GPA.

The findings of a relationship between region of origin and GPA is like previous findings (Shulruf et al., 2011; Sommers & Park, 2017). However, in the previous research, students from the islands of Java and Bali had significantly lower GPAs (Sommers & Park, 2017) and in this research study the students from Papua island had a significantly lower GPA for Cohort 2016 and the combined sample. It may be that by expanding the region of origin categories better explored the region of origin association with GPA. In addition, other explanations for the relationship, rather than just the island of origin (i.e. other variables that influence the experience factor such as culture, leadership roles, etc. may assist in explaining that relationship.

Similar to the results of this study, previous studies have also found a relationship between admission exam scores and GPA in first year students (Shulruf et al., 2011; Sommers & Park, 2017; Underwood et al., 2013). The findings in this study of a relationship between gender and GPA in first year students was not found in previous studies (Shulruf et al., 2011); however, it was only found in students admitted in 2016, but not 2017. In the current study, students that did not attend a health/science focused vocational or high school had a lower GPA at the end of the first semester.

As in the previous study (Sommers & Park, 2017), the admission exam scores for English and Indonesian had the most influence on first semester GPA for all three samples. For students admitted in 2016, they were enrolled in a General English course the first semester and those that scored higher on the admission English exam may also have achieved a higher grade in the General English course, resulting in a higher GPA; however, for students admitted in 2017, they did not have any language courses the first semester. It may be that those that scored higher on the language admission exams have a better reading and writing ability that influenced their general performance in all courses, resulting in a higher GPA.

There are several limitations to this study. There is the potential for bias, as the six students that were excluded because of missing data, did not complete the first semester. These six students may have different characteristics from the rest of the samples. A threat to internal validity is that there may have been factors that occurred during the first semester (i.e. tutoring, student ability to transition, personal habits, etc.) that were not controlled, and these may have also influenced the first semester GPA.

This study adds to the body of knowledge related to the holistic admission model. Factors of experience, attributes, and academic metrics were found to have an association with first semester GPA. The variables in this study only accounted for 30% (Cohort 2016), 37% (Cohort 2017), and 38% (Combined) of the variance in the first semester GPA. Other factors of experience, attributes, and academic metrics are influencing the first semester GPA that were not included as variables in this study. More research is needed to determine what other variables are associated with first semester GPA in first year nursing students (i.e. interview results, psychology testing results, support during the semester, study habits, etc.). The variables may be a combination of admission factors (i.e. experience, attributes, and academic metrics as described by the holistic admission model) and factors that occur during the first semester (i.e. tutoring, transition to university, study habits). Other researchers have suggested that factors such as stress, self-efficacy, satisfaction, and motivation in nursing students may have a relationship with student success (Jeffreys, 2015). Further research is needed to identify and study these variables.

All of the admission exam scores had a positive relationship with GPA. Students that attended a social science vocational or high school had a negative relationship with GPA, with a decrease in GPA of around 0.1 lower than students from a science high school. The Indonesian government requires that students graduate from nursing school with a GPA of 2.75, a change of around 0.1 in the GPA has a meaningful significance, as students who have a GPA of 2.74 cannot complete the nursing program. The other findings of gender (Cohort 2016), attendance at pre-nursing course (Cohort 2017), and region of origin (Cohort 2017) may not have meaningful implications in identifying students at possible high-risk for a GPA less than 2.75, as the findings were not consistent with both groups of admitted students. Identifying high risk students early and implementing support interventions early may assist the students to improve their GPA and successfully complete the nursing program. Possible support interventions could include academic counseling, study skill workshops, writing resources, and support groups. Other research has recommended a focus on improving the success of all students, not just high-risk students, to develop a variety of support interventions and increase completion rates in a nursing program (Jeffreys, 2015). This could involve having different levels of language courses, based on the student's ability when entering the nursing program. Additional research is needed regarding the relationship of student support interventions and other factors that occur during the first semester, if any, have on GPA.

Declaration of Conflicting Interests
There are no conflicts of interest to declare.

Author Contributions
Both authors made significant contributions to the conception, design, execution, data acquisition, or analysis/interpretation of the study and have approved the final version of the manuscript and have agreed to its submission for publication.

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Cite this article as: Sommers, C. L., Wirawan, G. (2019). The relationship of demographic and admission exam scores with first semester grade point average in two cohorts of first year nursing students. *Belitung Nursing Journal, 5*(1): 23-31. https://doi.org/10.33546/bnj.628

BNJ BELITUNG NURSING JOURNAL

ORIGINAL RESEARCH

THE CORRELATION BETWEEN FAMILY FUNCTIONING AND QUALITY OF LIFE OF CAREGIVER OF CHILDREN WITH LEUKEMIA

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Article Info:
Received: 9 October 2018
Revised: 11 November 2018
Accepted: 2 December 2018

DOI:
https://doi.org/10.33546/bnj.612

Abstract

Background: Quality of life of caregiver of children with leukemia is important because it can affect the quality of care provided and can affect the health of children and the caregiver themselves. One of the factors that influence the caregiver's quality of life is the family functioning. However, a few number of research on the correlation of family functioning in the caregiver's situation.

Objective: The aim of the study was to analyze the correlation between family functioning and the caregiver's quality of life of children with leukemia.

Methods: This study used a Quality of Life Family Version questionnaire and a Family Assessment Device questionnaire. The populations in this study were all parents (father or mother) who were the primary caregiver of children with leukemia aged 0-15 years and were being treated at a referral hospital in West Java, Indonesia. Thirty-two respondents were determined by a total sampling technique. The data analysis used frequency distribution and chi-square.

Results: The results showed that the family functioning and quality of life of the caregiver had the same results, 50% good and 50% poor. Correlation test in this study showed a negative value with p value > 0.05 (0.480), which indicated that there was no correlation between family functioning and the quality of life of the caregiver.

Conclusion: The correlation between family functioning and caregiver's quality of life was not significant. This is likely due to the variable family functioning and the caregiver's quality of life having balanced results. The results of this study need to be followed up by providing nursing care holistically not only to children, but also to families, especially who are directly involved in child care.

KEYWORDS
children; family functioning; leukemia; parents; quality of life

ISSN: 2477-4073

INTRODUCTION

Cancer does not only occur in adults, but also in children. According to World health Organization (WHO, 2017), the incidence of cancer in children increases every year. The number reaches 110-130 cases per one million children. In Indonesia, every year the Indonesian Child Protection Commission records 4,100 new cancer cases occur in children (Indonesian Child Protection Commission, 2017). According to Indonesian Child Oncology Foundation, types of cancer that frequently occur in children in Indonesia are leukemia and retinoblastoma (Indonesian Childhood Cancer Foundation, 2017). Leukemia that often occurs in children is acute lymphoblastic leukemia (ALL). A study found that leukemia is a type of cancer that occurs in children under 15 years, around 30-40%. In addition, other data revealed that the incidence of leukemia in Indonesia is around 2.5–4.0 per 100,000 children with an estimated 2000-3200 new cases of LLA each year.

Based on the data from one referral hospital in West Java, the number of children suffering from leukemia cancer in the first ten months of 2017 was 328 children. Therefore, this study focuses on pediatric patients with leukemia.

In the treatment process, parents always accompany children. In this case, parents have a role as caregivers. Caregiver is someone who is fully responsible and directly involved in the patient care process. Caregiver is a person who is fully responsible and directly involved in patient care, such as fulfilling the basic needs and treatment of patients. There are two types of caregivers, namely formal caregivers and informal caregivers. Formal caregivers are people who provide professional, trained, paid care, and are part of a service system such as hospitals, health centers, psychiatrists or other professionals. While informal caregivers are people who provide care but not experts or professionals, do not get paid, and live together or not with patients. Informal caregiver consists of parents, children, spouse, friends, relatives, or neighbors (Duci & Tahsini, 2012).

The care provided by both father and mother as an informal primary caregiver is not only limited to fulfilling the needs of daily activities, but more complex than that. Caregiver has a heavy responsibility in taking care of patients such as caring for patients, financing for treatment and providing emotional support (Hudson et al., 2010). In addition, the family has a role as an advocate, medical and technical counselor. Parents learn to identify and see the side effects of treatment received by their children. The dilemma of parents involved in child care is when parents provide care that is often painful and frightening for children, but on the other hand parents want to entertain, protect and keep children from suffering and pain (Jones, 2012).

In the care process, the caregiver's responsibilities are carried out over a long period of time which can be a burden for the caregiver. The study revealed that the consequences of prolonged care in children with cancer caused a negative impact on the caregiver, which caused stress and decreased quality of life (Litzelman, Catrine, Gangnon, & Witt, 2011). Quality of life is a condition where an individual is in a state of prosperity. Quality of life is a subjective matter where everyone has a different quality of life. The caregiver's quality of life in cancer patients can change due to a new role in caring for cancer patients, lack of social support, problems with work and lack of time to gather with family (Duci & Tahsini, 2012).

Quality of life of a person could be influenced by several factors. In general, factors that can affect a person's quality of life are individual characteristics and environmental characteristics (Wilson & Cleary, 1995). Based on literature review (Son et al., 2012), the factors that can affect the caregiver's quality of life with cancer children include sociodemographic factors (age, gender, education, and culture), cancer that the child has (type of cancer, severity of cancer and duration of treatment), condition of the caregiver (psychological, health, family functioning, and social support). McMaster's family functioning model theory proposed by Epstein (Epstein, Baldwin, & Bishop, 1983) stated the process of the family system as the core, and assumed that the basic function of family is to provide appropriate environmental conditions for family members to develop on the physical, psychological, social and other aspects (Dai & Wang, 2015). Family functioning is a complex concept covering affective, structural, control, cognitive, and external relations dimensions. Examples of family functioning include harmonious relationships, the involvement of family members (affective dimensions), the division of responsibilities and roles between family members (structural dimensions), the maintenance of a safe family condition (control dimensions), the decision making and problem solving in deliberation (cognitive dimensions), and maintaining a positive relationship with relatives (external relations dimension) (H.-S. Kim & Kim, 2008).

According to previous study (Son et al., 2012), family functioning is an important factor in the quality of life of the caregiver. Caregiver with a good family functioning has a better quality of life in all domains, except burden. Another study (Rodríguez-Sánchez et al., 2011) states that the quality of caregiver's life is observed from 4 dimensions, namely dimensions of social support, general satisfaction, physical and mental health and lack of free time. Of the 4 dimensions examined in this study, only physical and mental health dimensions have an effect on family functioning. From the results of this study, family functioning shows that physical health and mental caregiver are seen from the satisfaction received from their families, discussion with their families, being able to feel family affection, satisfied with the time the family spent with them and making family decisions.

Good family functioning or functional family is where all family members participate, contribute and work together on an equal basis and with enthusiasm for collective welfare. Sometimes some family members take care of their dependents, but more often the burden of care is carried out by one person: the main caregiver. In the care process, this significantly affects the caregiver in physical, mental, social and economic aspects. The care process carried out by the caregiver can cause burdens such as excessive tasks and usually change the dynamic of family functioning (Rodríguez-Sánchez et al., 2011).

According to literature (Yağcı-Küpeli, Akyüz, Küpeli, & Büyükpamukçu, 2012), if the caregiver's quality of life decreases, it may cause a direct negative impact on the quality of life of the child. If parents are stressed about their child's condition, it will affect the child's clinical condition, treatment outcomes and physical suffering. A study also mentioned that if there is an improvement in the caregiver's quality of life and there is a decrease in the stress level of the caregiver, this can improve the quality of life of children with cancer (Tsai et al., 2013). The importance of family functioning in cancer childcare requires nurses to provide nursing care not only to children, but also provide nursing care to families. Family has an important role in nursing because families provide important resources to provide health services for themselves and others in the family (Tinkham, Voorhies, & McCarthy, 1984). Providing care refers to the family as a patient from a community nurse with a focus primarily on family needs and resolution (Ali, 2010).

METHODS

Study design

The type of research used was a correlational research, which is a study or analysis of the relationship between two variables in a situation or group of subjects. In this study, the researcher aimed to examine the correlation between family functioning and the quality of life of caregivers who have children with leukemia. The research approach used in this study was cross sectional where the researcher only did one-time data collection from each respondent (Arikunto, 2013).

Sample

The populations in this study were all parents who had a role as primary caregivers of children with leukemia aged 0-15 and were being treated in a referral hospital in West Java, Indonesia. The inclusion criteria in this study were all parents from children aged 0-15 years who suffered from leukemia and were willing to be respondents in this study. The exclusion criteria in this study were parents who were not willing to be respondents. The time of research began in May until June 2018. In this study, 32 respondents were determined by total sampling technique.

Instrument

The instrument used in this study consisted of 2 instruments, Family Assessment Device (FAD) and Quality of Life Family Version. The Family Device Assessment Questionnaire consists of questions categorized into seven sub-variables, namely solving problems, communication, family roles, affective responses, affective involvement, control behavior, and general functioning (Epstein et al., 1983). This instrument was modified by the researcher by adding six statements regarding the family care function. The FAD instrument consisted of 66 statements, divided into 35 negative statements and 31 positive statements measured using a Likert scale. Each negative statement has the lowest score of 1 and the highest score of 4, while each positive statement has the lowest score of 4 and the highest score of 1. It is said to have good family functioning if the score of family functioning ≥ mean value. The Quality of Life Family Version instrument consisted of 37 questions divided into 21 negative statements and 16 positive statements categorized into four sub-variables, namely physical health conditions, psychological health conditions, social conditions, and spiritual health conditions (Ferrell, 2005). This instrument is measured using the Osgood scale. There are negative and positive statements with the lowest score 0 and the highest score 10. Some question items have an inverse score, for example when the respondent circles the number "4" in the answer, the score given is 6 (10-4 = 6). It is said to have good quality of life if the score ≥ mean value. The instrument has been back translated, the method was used to check the accuracy of a translation. In this method, the questionnaire was translated into Indonesian by a linguist at the Language Center of the Faculty of Culture Sciences, Universitas Padjadjaran and translated back into English by another linguist. Then the accuracy of the translation results were carried out by translator team in English education institutions.

Ethical consideration

This research was carried out by upholding ethical principles namely autonomy, confidentiality and justice. This study was approved by the health research ethics committee in Dr. RSUP Hasan Sadikin Bandung with an approval number LB.04.01/A05/EC/115/IV/2018.

Data analysis

Univariate data in this study used descriptive analysis, namely the frequency distribution. Whereas for bivariate analysis was used chi-square correlation test.

RESULTS

Univariate Analysis

In **Table 1** it is shown that half of the respondents had a good quality of life (50%), while **Table 2** showed that most respondents (56.3%) had a poor quality of life in the subdimension of psychological health conditions. Meanwhile 53.1% of respondents had a good quality of life in the subdimension of physical health, social health and spiritual health conditions.

Table 1 Frequency Distribution of Caregiver's Quality of Life in Children with Leukemia (N=32)

Quality of Life Category	*f*	%
Good	16	50
Poor	16	50

Table 2 Sub-Dimensional Frequency Distribution of Caregiver's Quality of Life in Children with Leukemia (N=32)

Sub-dimensions of Quality of Life	Caregiver's Quality of Life			
	Good		Poor	
	f	%	*f*	%
Physical health conditions	17	53.1	15	46.9
Psychological health conditions	14	43.8	18	56.3
Social conditions	17	53.1	15	46.9
Spiritual health conditions	17	53.1	15	46.9

Table 3 Frequency Distribution of Caregiver's Quality of Life in Children with Leukemia based on Respondent Characteristics (N=32)

Respondent Characteristics	Caregiver's Quality of Life			
	Good		Poor	
	f	%	*f*	%
Age				
Late Adolescent (17-25 years)	2	28.6	5	71.4
Early Adult (26-35 years)	8	61.5	5	38.5
Late Adult (36-45 years)	5	45.5	6	54.5
Early Elderly (46-55 years)	1	100.0	0	0.0
Sex				
Male	5	62.5	3	37.5
Female	11	45.8	13	54.2
Education				
Primary School	2	28.6	5	71.4
Junior High School	5	35.7	9	64.3
High School	7	87.5	1	12.5
College	2	66.7	1	33.3
Duration of Giving Care to Children				
<12 months	12	54.5	10	45.5
>12 months	4	40.0	6	60.0
Income per month				
<1.5 million	9	42.9	12	57.1
1.5-2.5 million	4	66.7	2	33.3
2.5-3.5 million	2	50.0	2	50.0
>3.5 million	0	0.0	1	100.0
Ethnic group				
Javanese	2	25.0	6	75.0
Sundanese	14	58.5	10	41.7

Table 3 showed that younger parents tend to have a better quality of life compared to elderly parents. In addition, the percentage of parents who were female (54.2%) experienced a decrease in quality of life more than parents who were male (37.5%). However, when observed from the level of education and the amount of income, parents who had higher levels of education and higher income tend to have a better quality of life. When observed from a cultural background, Javanese parents (75.0%) tend to have poor quality of life than Sundanese parents (41.7%). In addition, parents who had treated their sick children for more than 12 months (60.0%) had a poor quality of life.

Table 4 Frequency Distribution of Family Functioning in Children with Leukemia (N=32)

Family Function Category	*f*	%
Good	16	50
Poor	16	50

In **Table 4** it is shown that half of the respondents had a good family functioning (50%), while **Table 5** shows that family functioning items in children with leukemia had a poor category in behavioral control items (81.3%). Meanwhile the item of family functioning that was in a good category is problem solving item and function in general (40.6%).

Table 5 Frequency Distribution of Family Functioning Items in Children with Leukemia (N=32)

No	Item	Good		Poor	
		f	%	*f*	%
1.	Problem solving	13	40.6	19	59.4
2.	Communication	10	31.3	22	68.8
3.	Role	9	28.1	23	71.4
4.	Affective Response	12	37.5	20	62.5
5.	Affective Involvement	10	31.3	22	68.8
6.	Behavioral Control	6	18.8	26	81.3
7.	Function in general	13	40.6	19	59.4
8.	Health Care Functioning	11	34.4	21	65.6

Table 6 Frequency Distribution of Family Functioning in Children with Leukemia based on Characteristics of Respondents (N=32)

Respondent Characteristic	Family Function			
	Good		Poor	
	f	%	*f*	%
Age				
Late Adolescent (17-25 years)	3	42.9	4	57.1
Early Adult (26-35 years)	3	23.1	10	76.9
Late Adult (36-45 years)	10	90.0	1	9.1
Early Elderly (46-55 years)	0	0.0	1	100.0
Sex				
Male	4	50.0	4	50.0
Female	12	50.0	12	50.0
Education				
Primary School	3	42.9	4	57.1
Junior High School	5	35.7	9	64.3
High School	6	75.0	2	25.0
College	2	66.7	1	33.3
Duration of Giving Care to Children				
<12 months	12	54.5	10	45.5
>12 months	4	40.0	6	60.0
Income per month				
<1.5 million	10	47.6	11	52.4
1.5-2.5 million	3	50.0	3	50.0
2.5-3.5 million	2	50.0	2	50.0
>3.5 million	1	100.0	0	0.0
Ethnic group				
Javanese	14	58.3	10	41.7
Sundanese	2	25.0	6	75.0

Table 6 revealed that younger parents tend to have poor family functioning compared to elderly parents. In addition, considering from the level of education and the amount of income, parents who had higher levels of education and higher income tend to have good family functioning compared to parents who had lower levels of education and income. From a cultural background, Javanese parents tend to have poor family functioning (75.0%) than Sundanese parents (41.7%). In addition, 60.0% parents who have treated their sick children for more than 12 months had poor family functioning.

Bivariate analysis

Bivariate analysis in this study determines the correlation of family functioning with the caregiver's quality of life in children with leukemia. **Table 7** showed that p value of the correlation is 0.480, greater than 0.05, which means the correlation between family functioning and caregiver's quality of life in children with leukemia is insignificant.

Table 7 Correlation of Family Functioning with Quality of Life Caregiver in Children with Leukemia (N=32)

Family Function	Caregiver's Quality of Life				p value
	Poor		Good		
	f	%	*f*	%	
Poor	7	43.8	9	56.3	0.480
Good	9	56.3	7	43.8	

DISCUSSIONS

Quality of life of caregiver of children with leukemia

The quality of life of caregiver of children with leukemia in this study showed that as many as 50% of parents have a poor quality of life and as many as 50% of parents have a good quality of life. Previous research (Gamayanti, Rakhmawati, Mardhiyah, & Yuyun, 2012) at RSUP Dr. Hasan Sadikin Bandung showed that the caregiver's quality of life in children with leukemia was in a good category, but there was also result of another studies (Lim et al., 2017; Yu et al., 2017) which stated that parents who cared for children with cancer had a poor quality of life. Based on each sub-dimension of quality of life (see **Table 2**), the majority of parents had a poor quality of life in the sub-dimension of psychological health conditions (56.3%). While caring for their children, parents experience decreased concentration and memory; parents also experience feelings of oppressed, stress, and difficulty in caring for their sick children. These feelings may arise because of the additional burden on parents in the form of financial burden or responsibility burden (Hacialioglu, Özer, Erdem, & Erci, 2010). Medical and treatment costs including drugs and diagnostic tests for serious diseases such as cancer are quite high, so that obviously can enhance the financial burden of parents (Yousuf

Zafar, 2015). While the burden of responsibility may arise because parents must provide care to their sick children for a long period of time (Stenberg, Ruland, & Miaskowski, 2010). The additional responsibility felt by parents is that besides having to take care of their sick children, they also have to take care of household affairs, their spouse and other children.

Parents experience anxiety, apprehension, and fear of the diagnosis of leukemia that occurs in their children. They afraid of the prognosis of the disease that afflicts their children making them feel anxious at all times (Khoury, Huijer, & Doumit, 2013). The apprehensive feeling of being abandoned and sad when they see their children experience difficult conditions is naturally felt, but if it is excessive, it can have a bad impact on psychological health. Parents may not concern to the quality of care given to their child because it is dissolved in the perceived sadness, and this will have an impact on the patient's quality of life (Park et al., 2013).

From the characteristics of respondents (**Table 3**), the results of the study showed that younger parents tend to have a poor quality of life. According to previous study (Y. Kim & Spillers, 2010), at a younger age they have a high level of stress because of the new role as a caregiver. Poor quality of life also appears more in parents with female gender (54.2%). Women who care for family members with cancer have a lower quality of life than men who care for family members with cancer (Y. Kim & Given, 2008).

Characteristics of respondents at the education level showed that parents who had a poor quality of life were mostly from primary school (71.4%). According to study (van den Tweel et al., 2008) that the low level of education of caregivers of children with anemia is associated with low motor function and high pain scores experienced by the caregiver. This occurs because parents with low level of education have a poor perception of health, so that it may decrease the quality of life. In addition, the results of the study also showed that parents who have a poor quality of life are mostly in low-income parents, with an average monthly income less than 1.5 million rupiah (57.1%). As expressed by Dumont *et al*. (Dumont et al., 2006), that parents with economic difficulties experience an increased burden of care and a decrease in quality of life. The existence of a financial burden can cause parents to experience stress so that it can reduce their quality of life (Kitrungrote & Cohen, 2006; Santo, Gaiva, Espinosa, Barbosa, & Belasco, 2011).

Considered from a cultural background, Javanese parents from have a poor quality of life. Researchers assumed the culture of parents in this study as parents with Asian cultural backgrounds. According to previous study (Yu et al., 2017), parents who care for leukemia children with Asian cultural backgrounds have a poor quality of life compared to parents with Western cultural backgrounds. This can happen because in Asian countries, family members play an important role in treating patients in the hospital. They also do many tasks that if in Western countries, the task is carried out by nurses.

Family functioning in children with leukemia

Family functioning in children with leukemia in this study showed that as many as 50% of parents have a poor family function and as many as 50% of parents have a good quality of life (see **Table 4**). In the study conducted by Martin et al. (Martin et al., 2012), it showed that parents who care for children with leukemia have good family functioning. Whereas another study (Alderfer, Navsaria, & Kazak, 2009) stated that parents who care for children with leukemia have poor family functioning. Based on sub-dimension of family functioning, parents have poor family functioning in the dimension of behavior control (81.3%). This is in accordance with previous research (Watson et al., 2006) which stated that parents, namely father or mother, have poor behavioral control when a child has cancer. Poor behavioral control in parent will make children suffering from cancer have external problems. Parents' behavior in this matter can be demonstrated by providing support to their children during the treatment process.

The results of this study also showed that parents who had treated their children for more than 12 months had the majority of poor family functioning (60%) compared to parents who have cared for their child less than 12 months (57.1%). According to (Sloper, 2000), 18 months after diagnosis, it was found that the level of distress of most parents was not reduced and some parents showed an increased level of distress related to family relationship and repeated hospital care. Families' ability to overcome multiple sources of stress and uncertainty associated with the diagnosis and treatment of their child's cancer will probably affect the quality of life of children. From the perspective of the family system, what happens to one family member influences other members. In turn, how families respond to difficulties affecting children's responses and functioning, in a sequence of circular effects (Hosoda, 2014).

In this study, from the amount of parents' income per month, parents whose income <1.5 million per month has poor family functioning (52.4%). According to previous study (Panganiban-Corales & Medina, 2011), low income families will have difficulties in fulfilling their daily needs. When their child is treated for a long time, the medical expenses will increase so they sometimes cannot afford the medical expenses. Meanwhile, according to Young et al. (2005) (Yun et al., 2005), families who have low income more often use their savings money for medical expenses because they have financial problems or do not have health insurance to pay for medical expenses that have been incurred. According to Klassen et al. (Klassen et al., 2011), low income families will have an economic burden. this economic burden will have a long impact on their family life. Parents need a supportive and flexible work environment during their child's care and need to learn about how to access various financial and other resources available to help with treatment expenses.

Correlation of family function and quality of life of caregiver of children with leukemia

The results showed that the p value of correlation was 0.480, which means that the correlation between variables of family functioning and caregiver's quality of life was not significant.

The results of data analysis on the caregiver's quality of life and family functioning showed half good and half poor. The results of this study prove that it is not entirely a state of good quality of life due to good family functioning but can be due to other supporting factors.

The results of this study were different from the results of the previous study (Rodriguez-Sánchez et al., 2011) which stated that family functioning had a correlation with the quality of life of the caregiver. This is because in their study, the number of respondents was 153 people and the questionnaire used was Family APGAR and Ruiz-Baca QoL test. Their study stated that the dimensions of quality of life that have a correlation with family functioning are only the dimensions of physical health and the dimensions of psychological health. A study conducted by Yu et al. (Yu et al., 2017) also showed that there is a correlation between family functioning and caregiver's quality of life. This is because in this study the number of respondents was 309 people and the questionnaires used were Family APGAR and WHOQOL-BREF. The study stated that the quality of life of the caregiver and family functioning both have poor category results. In the study also mentioned that the dimensions of quality of life that have a correlation with family functioning are psychological dimensions, social dimensions and environmental dimensions. Another study (Son et al., 2012) also showed a correlation between family functioning and caregiver's quality of life. In this study, the number of respondents was 100 people and the questionnaires used were Family APGAR and CQOLC. The study mentioned that the dimensions of quality of life that have a relationship with family functioning are dimensions of disturbance, dimensions of positive adaptation and dimensions of financial problems.

The results of this study indicate that there is no correlation between family functioning and caregiver's quality of life, so that there is a possibility that there are still other factors that have more influence on the quality of life of the caregiver. According to study (Son et al., 2012), there are factors that can affect the quality of life of the caregiver with a child with cancer. These factors include sociodemographic factors (age, gender, education, and culture), cancer that children have (type of cancer, severity of cancer and duration of treatment), condition of the caregiver (psychological, health and social support). Limitations in this study are the number of respondents. However, referring to the results of this study, it is very important for nurses and other health workers to provide holistic nursing care not only for pediatric patients with cancer but also for their families, so that not only the patient's quality of life is good but also the quality of life of their caregiver.

CONCLUSION

Family functioning in children with leukemia and caregiver's quality of life in children with leukemia shows similar results, namely 50% good and 50% bad. These results indicate that there are still parents who have poor quality of life and poor family functioning. Based on these results, it indicates that family functioning is not correlated to the quality of life of the caregiver in children with leukemia with the results of $p > 0.05$. This is obtained because the variables of family functioning and quality of life of the caregiver have balanced results. The results of this study need to be followed up by providing nursing care holistically not only to children, but also to families, especially parents who are directly involved in child care. Nursing care for families need to be a concern so that good quality of life and family functioning are maintained well and also to improve the quality of life and family functioning that are still in the poor category.

Declaration of Conflicting Interests
The authors declare no conflicts of interest.

Authorship Contribution
All authors conceived of the presented idea, provided critical feedback, and analyzed the research as well as discussed the results and contributed to the final manuscript. **AF** performed the data collection

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Cite this article as: Fadhilla, A., Nurhidayah, I., Adistie, F. (2019). The correlation between family functioning and quality of life of caregiver of children with leukemia. *Belitung Nursing Journal, 5*(1): 32-40. https://doi.org/10.33546/bnj.612

BNJ BELITUNG NURSING JOURNAL

ORIGINAL RESEARCH

THE RELATIONSHIP BETWEEN NURSES' PERCEPTIONS AND SELF-EFFICACY IN IMPLEMENTING PALLIATIVE CARE IN THE INTENSIVE CARE UNIT

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Article Info:
Received: 18 October 2018
Revised: 7 November 2018
Accepted: 11 December 2018

DOI:
https://doi.org/10.33546/bnj.607

Abstract

Background: The increasing need for palliative care in intensive care unit (ICU) is indicated by the increasing number of patients with critical and terminal conditions or life-threatening diseases. A comprehensive handling through palliative care by nurses is needed. Self-efficacy is the main predictor that influences the application of palliative care in ICU. Therefore, nurses should have high self-efficacy in order to provide qualified palliative care for patients and their families.

Objective: This study aimed to analyze the relationship between perceptions and self-efficacy of nurses in applying palliative care in ICU.

Methods: This study was a correlational study with a cross sectional approach. The sampling technique used was total sampling, which involved all nurses who were actively working at the Bandung General Hospital during the study. There were 127 people in total. Data were collected using questionnaires. Descriptive analysis was used for the univariate analysis and Pearson correlation test was used for bivariate analysis.

Results: The results of univariate analysis showed that the majority of respondents had high self-efficacy (56.7%) and negative perceptions (52%) related to palliative care in the intensive room. Based on the results of bivariate analysis, there was a significant relationship between perception and self-efficacy variables (p value = 0.000).

Conclusion: The results showed that high number of respondents had negative perceptions related to their competences in implementing palliative care in the ICU. Therefore, socializations and trainings related to this are needed, which focus on nurses' beliefs in their abilities.

KEYWORDS
ICU; nurses; palliative care; self-efficacy

ISSN: 2477-4073

INTRODUCTION

Palliative care is basically a comprehensive care given to patients with serious diseases that are life-threatening or life-limiting (Shreves & Marcolini, 2014). The increasing need for palliative care arose since the introduction of the importance of this program in the health care area in the United States (US). There was an increase of up to 125% from 2000-2008 (Urden & Stacy, 2013). Palliative care is not only given in community settings, but also given in the care of in patient services in hospitals, such as the Intensive Care Unit (ICU) (Payne, Seymour, & Ingleton, 2008). ICU is a treatment area which is full of various sophisticated technological innovation tools aiming to extend the lives of patients with critical conditions (Cox, Handy, & Blay, 2012). This critical patient condition often causes pain that is not recognized or treated, shortness of breath, delirium, fatigue, lack of appetite, drowsiness, dyspnea, anxiety, depressive mood and weakness, constipation, tightness, nausea and vomiting, fever and infection, edema, anxiety, delirium, and metabolic disorders (Ayasrah, O'Neill, Abdalrahim, Sutary, & Kharabsheh, 2014; Delgado-Guay, Parsons, Li, Palmer, & Bruera, 2009; National

Clinical Effectiveness Committee, 2015; Nelson, Mulkerin, Adams, & Pronovost, 2006; Urden & Stacy, 2013; Wilkie & Ezenwa, 2012). The palliative care provided in ICU contributes positively to the patient, family and clinician team (Aslakson, Curtis, & Nelson, 2014). In providing high-quality and effective palliative care in ICU, nurses play a strategic role for being the primary liaison between patients, families and other members of the multi-professional team. However, professional nurses nowadays may not always be ready to provide qualified palliative care for patients and families (Fitch, Fliedner, & O'Connor, 2015; World Health Organization, 2008).

Self-efficacy is an internal factor that greatly influences nurses in implementing palliative care (Gaffney, 2015). This is supported by the statements in previous studies (Ferrell, Coyle, & Paice, 2015; Lenz & Shortridge-Baggett, 2002; Zulkosky, 2009) that self-efficacy is the most important predictor in influencing changes in individual behavior and providing satisfactory results. It is also a predictor that influences nurses in providing quality palliative care. Self-efficacy is someone's belief in his ability to do something to achieve his goals (Bandura, 2005). Within the context of nursing, self-efficacy is an important aspect that supports nurses' skill performance (Tyler et al., 2012). Nurses' self-efficacy correlates with professional autonomy and empowerment. Nurses with high self-efficacy perceive obstacles as opportunities instead of threats (Manojlovich, 2005). High self-efficacy also influences the quality of clinical performance which later leads to satisfactory outcome of patients (Joy, 2015).

According to the study (Gaffney, 2015), the current phenomenon happened is that nurses' self-efficacy is not balance. There are nurses who have low self-efficacy while some others have high self-efficacy. This problem relates with individual perception about the importance of palliative care. Perception is the final process of observation, in which individuals will recognize and understand the condition of the surrounding environment (external perception) as well as the condition within themselves (internal perception). Eventually, the perception affects one's self-efficacy in determining the objective of certain action to do (Bandura, 2004; Sunaryo & Kes, 2004). Nurses' perception of palliative care supports and enhances a therapeutic relationship between nurses and patients (Johnston & Smith, 2006). The perception might differ among nurses (Rodriguez, Barnato, & Arnold, 2007) in which they found a number of nurses who believed that palliative care should only be given to patients who are badly, dying, suffering form cancer, and to perform pain-relieving treatment in the last moment of one's life.

Study (Sarfo, Opare, Awuah-Peasah, & Asamoah, 2017) also found that 22% nurses believe that palliative care is only given to dying patients. In addition, many nurses have wrong perception that palliative care, especially spiritual support, is not a priority care that should be given to patients. This different perception obstructs the process of palliative reference, resulting in less optimal utilization of palliative care which eventually decreases self-efficacy among nurses in achieving certain goals of certain action (Gaffney, 2015; Rodriguez et al., 2007). Regarding those explanation, the researchers were intrigued to analyze the relationship between nurses' perception about palliative care and their self-efficacy in implementing palliative care in ICU.

METHODS

Study design & sample

This research was a quantitative research, which used analytic descriptive study with cross sectional study design or cross sectional. The study was conducted in the intensive room of the Bandung General Hospital from May to June 2018. The sampling technique used in the study was a non-probability sampling technique namely total sampling. There were 127 actively working nurses involved in this research.

Instrument

This study employed 3 questionnaires, namely demographic questionnaire, perception questionnaire and nurse self-efficacy in the application of intensive palliative questionnaire. Questionnaire on respondents' characteristics contained age, sex, intensive unit, religion, recent education, ethnicity and palliative education activities. The researcher used the standard perception questionnaire from White & Coyne (White & Coyne, 2011) and self-efficacy questionnaire from Desbiens, Gagnon & Fillion (Desbiens, Gagnon, & Fillion, 2012). A survey questionnaire namely Palliative Care Practice of Registered Nurses (PCPCRN) proposed by White and Coyne since 1999 was employed to collect data on nurses' perception about palliative care. This instrument consisted of some questions which were categorized into two parts based on the level of importance of palliative care (10 domains) and the level of individuals' competence in performing palliative care (10 domains) (White, Rozzen, Coyne, & Wiencek, 2014). Nurses' self-efficacy was measured using a survey questionnaire namely Palliative Care Nursing Self-Competence Scale (PCNSC) developed by Desbiens & Fillion (Desbiens et al., 2012). In this research, surveys were conducted to measure nurses' self-efficacy based on ten categories or ten palliative care dimensions which included physical needs: pain (5 items), physical needs: other symptoms (5 items), psychological needs (5 items), social needs (5 items), spiritual needs (5 items), needs related to patients' functional status (5 items), ethical and legal issues (5 items), inter-professional collaboration and communication (5 items), personal and professional issues related to nursing care (5 items) and end-of-life care (5 items).

The results of measurement on perception and self-efficacy were then analyzed using T score using this following formula: $T = 50 + 10 (x - X/s)$ (Azwar, 2010). The score obtained from the test were then categorized into these following categories: positive perception or high efficacy = if T score ≥ mean score, whereas, negative perception or low efficacy = if T score is lesser than the mean T score. The researcher categorized the variables to make it easier to describe the results of research based on those categories, which results were not to be analyzed. The researcher did a back translation and retested the validity and reliability of the questionnaire on 42 intensive

nurses using Pearson product moment correlation for validity and Cronbach alpha for reliability. All items on the perception questionnaire and self-efficacy were valid. The PCPCRN and PCNSC questionnaire were reliability because the reliability coefficient value was greater than 0.7 (Cronbach alpha = 0.841 for perception about importance of palliative care, Cronbach alpha = 0.888 for perception about individuals' competence in performing palliative care, Cronbach alpha = 0.908 for physical needs: pain, Cronbach alpha = 0.948 for physical needs: other symptoms, Cronbach alpha = 0.873 for psychological needs, Cronbach alpha = 0.913 for social needs, Cronbach alpha = 0.889 for spiritual needs, Cronbach alpha = 0.903 for needs related to patients' functional status, Cronbach alpha = 0.927 for ethical and legal issues, Cronbach alpha = 0.952 for interprofessional collaboration and communication, Cronbach alpha = 0.959 for personal and professional issues related to nursing care, and Cronbach alpha = 0.930 for end-of-life care).

Ethical consideration

Before collecting data, the researcher conducted ethical clearance from the Ethics Committee of Hasan Sadikin General Hospital (RSUP) Bandung on March 29, 2018 number: 1193 / UN6.L6 / LT / 2018. The authors confirmed that all respondents have obtained an appropriate informed consent.

Data analyses

Univariate analysis was used to determine the frequency of each variable. For bivariate test analysis, Pearson correlation test was used because the data were normally distributed.

RESULTS

Based on the results of the statistical analysis in **Table 1**, the data on respondents' characteristics showed that the majority of respondents were female (73.2%), came from the GICU treatment room (57.5%), had the last education of D3 in Nursing (62.2%) and had not attended education related to palliative care (75.6%). In addition, almost all respondents aged 26-45 years (86.6%), were Muslim (97.6%) and were Sundanese (76.4%).

Table 1 Characteristics of ICU Nurses in Bandung General Hospital in 2018

Characteristics	n = 127	
	Frequency	%
Age (years)		
17-25 (Late Adolescence)	3	2.4
26 - 35 (Early Adulthood)	52	40.9
36-45 (Late Adulthood)	58	45.7
46 - 55 (Early Old Age)	12	9.4
56 - 65 (Late Old Age)	2	1.6
Gender		
Male	34	26.8
Female	93	73.2
Intensive Unit		
Cardiac Intensive Care Unit (CICU)	20	15.7
General Intensive Care Unit (GICU)	73	57.5
Neonatal Intensive Care Unit (NICU)	19	15.0
Pediatric Intensive Care Unit (PICU)	15	11.8
Religion		
Islam	124	97.6
Non – Islam	3	2.4
Last education		
D3	79	62.2
Bachelor degree	45	35.4
S2	3	2.4
Tribe		
Sunda	97	76.4
Java	19	15.0
Others	11	8.7
Palliative Education		
Never joined any	96	75.6
Non-formal education	20	15.7
Formal education	2	1.6
Formal and Non-Formal Education	9	7.1

Table 2 Frequency Distribution of Nurses' Perception and Self-Efficacy Variables in Implementing ICU Palliative Care in Bandung General Hospital in 2018 (n = 127)

Variable	Frequency	%
Efficacy		
Low	55	43.3
High	72	56.7
Nurse's Perception		
Negative	66	52
Positive	61	48

Table 3 Bivariate Analysis of Dependent and Independent Variables of ICU Nurses in Bandung General Hospital in 2018 (n = 127)

Independent Variable	Mean ± SD	Min - Max	Self-efficacy *p value*
Nurse's perception	44 ± 7	27 – 60	0.000 *

*Description: Pearson correlation test, the significance value was α = <0.05

Based on the results of data analysis in **Table 2**, most respondents (56.7%) had high self-efficacy and had negative perceptions related to the practice of intensive palliative care (52%). While the results of data analysis in **Table 3** showed that the significance value was α = <0.05 in the perception variable ($p = 0.000$). It showed that the research hypothesis was accepted, which indicated that there was a correlation between nurses' perception and self-efficacy variables in implementing palliative care in ICU in Bandung General Hospital.

DISCUSSIONS

Most respondents in this study had negative perceptions related to the practice of intensive palliative care (52%). This was supported by the data, which showed that the majority of respondents rated that assessing support and resources (51.2%) and providing culturally sensitive care for patients and families (53.5%) were quite important to be implemented. There were respondents (0.8% - 15%), which rated that all domains of palliative care were quite important to implement. In addition, respondents also considered themselves not (2.2%) and quite competent (21%) in carrying out all domains of intensive palliative care. The majority of respondents mentioned that the obstacles which were often encountered in implementing palliative care in ICU were the lack of socialization and training provided for the nurses (57.5%), difficulties in communicating with teams and families (23.6%), human resources (HR) who were not competent enough (3.9%), and there was no standard operating procedure (SOP) related to the implementation of palliative care (0.8%).

This was supported by the results of previous study (Gulini et al., 2017), which showed that there was the lack of standardization set by hospitals in providing palliative services for patients and families; according to the nurses, (protocol, SOP) and lack of training for medical teams specifically nurses related to palliative care. The other factors included a bad role model for ICU nurses, lack of experience in applying palliative care, lack of knowledge of nurses in understanding the symptoms of death, and communication with families in preparing the dying process of patients (Ahmed et al., 2004).

The results of this study were also similar to the research (Wolf, 2016), which the domain of assessing support and resources and providing culturally sensitive care for patients and families was ranked lowest in the percentage of "very important" category. In addition, as many as 45.8% of respondents stated that they were not or quite competent in the domain of knowledge of advanced instruction, living will, power of attorney and DNR policy. 25% of respondents considered themselves not and rather competent in the domain of reviewing support and resources, giving culturally sensitive care and communication with patients and families.

Study shown that cultural factor was one of the obstacles that affected nurses in implementing palliative care. Different cultures can lead to different perceptions and increase misunderstandings between nurses, patients and families, for example the intonation or dialect in communication. Therefore, in improving the relationship between nurses and patients and families, there is a need for mutual respect to minimize the occurrence of misunderstanding due to differences in culture and language culture (Arumsari, Emaliyawati, & Sriati, 2017).

Based on the results of this study, the majority of respondents rated all domains of palliative care as very important to be carried out in intensive space (57.42%), but there were only 14.50% respondents who considered themselves highly competent in carrying out all domains of palliative care. This was similar to the results of previous study (Wolf, 2016) that almost all respondents (90%) rated the domain of pain management, interdisciplinary collaboration, and communicating the death to patients and families as very important domains. However, there were only less than 35 % of respondents who felt that they were very competent in one of the three domains. This phenomenon shows that there are

differences in respondents' perceptions or understanding. They perceived that all domains of palliative care are very important to implement, but they considered themselves to be incompetent in implementing all domains of palliative care.

Based on the results of bivariate analysis, there was a positive correlation between respondents' perceptions of the practice of palliative care and self-efficacy in applying palliative care in intensive room (*p value* = 0.000). This was supported by research data, which showed that the majority of respondents who had positive perception had high self-efficacy (62.5%). It was also supported that the majority of respondents realized that the support and resource assessment (51.2%) and culturally sensitive care for patients and families (53.5%) were quite important to implement.

The results of this study were in line with the opinion of Sunaryo (Sunaryo & Kes, 2004) which states that perception is the final process of observation that begins with the sensing process, namely the process of receiving stimuli by the sensory organs, forwarded to the brain and ultimately the individual realizes perception. Through perception, individuals are aware and understand the environmental conditions that exist around them (external perception) as well as things that exist within themselves (internal perception). In the end, the perceptions can influence the individual's self-efficacy in determining the behavioral goals to be addressed (Bandura, 2004; Sunaryo & Kes, 2004).

Findings of this study showed that respondents with positive perceptions had high self-efficacy (62.5%). Respondents stated that all domains of palliative care were important to be implemented and they considered themselves competent in implementing these domains. This showed that respondents who had high self-efficacy could believe in their abilities and tried to deal with any existing obstacles. This was supported by our research data that showed that in facing the existing obstacles respondents would try to provide care comprehensively and accustomed themselves to apply palliative care.

CONCLUSIONS

Based on the results of research on ICU nurses at Bandung General Hospital, it can be concluded that most nurses had high self-efficacy in applying all domains of intensive palliative care. Most respondents had negative perceptions related to palliative care. They considered that all domains of palliative care were very important to be implemented, but only a few felt that they were very competent in implementing the domain of palliative care. The lowest rank was the domain of culturally sensitive care, studying spiritual needs and communicating with patients and families. In addition, most respondents who had positive perception regarding palliative care had high self-efficacy in implementing palliative care. The high self-efficacy level of nurses in implementing palliative care was related to the nurses' perception related to the practice of palliative care. The results of this study indicated that there were still many nurses who had insufficient knowledge related to symptom management and psychosocial aspects and negative perceptions related to competence in implementing palliative care in intensive unit. It was due to the lack of information and training related to palliative care. Therefore, it was important for the hospital to provide socialization and training related to palliative care in intensive unit for all intensive nurses.

Declaration of Conflicting Interests
None declared.

Acknowledgment
The authors express the deepest gratitude to all respondents who sincerely want to be involved in this research, and to all who were actively involved directly or indirectly to make this research completed on time.

Authorship Contribution
TAK, **YT** and **AP** have designed, compiled and completed this study together, and the final version of the article was agreed by all authors.

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Cite this article as: Kurnia, T. A., Trisyani, Y., Prawesti, A. (2019). The relationship between nurses' perceptions and self-efficacy in implementing palliative care in the intensive care unit. *Belitung Nursing Journal, 5*(1): 41-46. https://doi.org/10.33546/bnj.607

Suantika, P.I.R., Hermayanti, Y., Kurniawan, T. (2019).
Belitung Nursing Journal. 5(1):47-53
https://belitungraya.org/BRP/index.php/bnj/index

BNJ BELITUNG NURSING JOURNAL

ORIGINAL RESEARCH

FACTORS ASSOCIATED WITH PARTICIPATION OF NURSES IN EARLY DETECTION OF CERVICAL CANCER

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Article Info:
Received: 9 October 2018
Revised: 8 November 2018
Accepted: 2 December 2018

DOI:
https://doi.org/10.33546/bnj.610

Abstract

Background: The number of cervical cancer still remains high among women, including nurses in Indonesia. This is due to low participation of them to early detect and prevent it.

Objective: This study aimed to identify the factors associated with the participation of nurses in early detection (pap-smear test) of cervical cancer at the hospitals in Bandung Indonesia.

Methods: This was a correlational study with a cross-sectional approach on 286 nurses selected using cluster sampling at three hospitals in Bandung on March 2018. Data were collected using health belief model (HBM) questionnaire. Data were analyzed using Chi-square or Fisher exact and multivariate logistic regression test.

Results: Factors associated with pap-smear behavior were the level of education, perceived susceptibility, perceived barrier and self-efficacy (p-value <0.05). Perceived susceptibility was the most correlated factor with pap-smear behavior with relationship strength (OR) of 16.259 and gave an effect of 27.89% as illustrated in the model equation of y = 0.324 + 2.789 susceptibility − 2.738 barriers.

Conclusion: Pap smear behavior of the nurses was still relatively low because they had a negative perception of susceptibility to cervical cancer. Therefore, information is needed to change the nurses' perception related to the susceptibility of symptoms and risk factors that encourages nurses to do the pap-smear and increase nurses' awareness to actively participate in cervical cancer prevention program.

KEYWORDS
behavior; health belief model; nurse; pap-smear

ISSN: 2477-4073

INTRODUCTION

Cervical cancer is the most common cancer in women and the leading cause of mortality in women worldwide. According to World Health Organization (WHO), there were 528,000 new cases of cervical cancer worldwide and its mortality reached 266,000 women (WHO, 2014). In Indonesia, cervical and breast cancer still occupied the highest number in 2013, cervical cancer of 0.8% and breast cancer of 0.5%. While in West Java, cervical cancer occupied the third position of 0.7% with an estimated number of approximately 15,635 women in 2013 (Ministry of Health of Indonesia, 2015). The main causes of cervical cancer are human papillomavirus (HPV) types 16 and 18. HPV spread occurs due to several factors, such as sexual behavior with multiple partners, early age of sexual intercourse, smoking behavior, poor nutritional needs, use of oral contraceptives over ten years, dirty environment and the number of births (Spencher, 2007). In addition, 50% of cervical cancers are more common in women with a history of never doing pap-smear.

Various attempts have been carried out to overcome cervical cancer such as surgery, chemotherapy and radiation (Peiretti et al., 2012). However, treatment does not always have a positive effect on cervical cancer but also has side effects on patient's body. Although treatment has a high success rate, in the early

stage of long-term treatment it causes many complications and side effects. In other words, prevention provides greater hope in solving the problems due to cervical cancer.

Cervical cancer is potentially prevented by early detection since development into cancer takes approximately 15-20 years (WHO, 2014). The effectiveness of screening in reducing the incidence of cervical cancer was found in some countries. The routine pap-smear shows to decrease mortality rate from cervical cancer 70-80% across the country and 90% in almost all developing countries (Sasieni, Castanon, & Cuzick, 2009). Pap-smear examination is more effective than other examinations such as Inspection Visual of Acetic Acid (IVA) because pap-smear examination is done into the vagina to see the surface cells of the cervix so we can distinguish pre-cancerous and cancer cells (Spencher, 2007).

Health workers are also experiencing the same problem, especially nurses. Nurses also experienced the incidence of cervical cancer as indicated in the previous study (Wulandari, 2012), which revealed there were two nurses at Kediri Baptist Hospital who died of cervical cancer. The low participation of nurses in early detection of cervical cancer is due to several factors, such as education level, not used to pelvic examination, fear of examination, feeling of shame (Othman & Rebolj, 2009). Other problems are due to low knowledge, low income, no family history of cancer, the related pain of examination and distance of health services (Jia et al., 2013; Lyimo & Beran, 2012). There are also other factors such as the nurses' perception about cervical cancer that there is no risk factor for nurses afflicted with cervical cancer, no symptoms experienced during their lives, feel not sure of the results and effectiveness of cervical cancer prevention and they do not perceive the benefits if doing early detection (McCarey et al., 2011).

Many theories and models related behaviors that explain the beliefs or perceptions of individuals to take preventive health action. One such theory is the Health Belief Model (HBM) that has evolved since the 1950s and is widely used as a framework to explain the behavior of health-related individuals such as disease prevention, screening, and controlling disease conditions. There are six major components in the development of HBM: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Glanz, 2008). These components become the basis of the individual in making a decision to take health action if the individual feels the benefits when doing prevention. In cervical cancer cases in previous study (Ma et al., 2013) using HBM found that the perceived benefits and perceived barriers had a strong influence on early detection while the perceived susceptibility to cervical cancer was very weak. It has proven that HBM could describe individual beliefs related to disease and could affect the decision making of health: it is early detection of cervical cancer. In accordance with the duties and roles in providing nursing care, which one of them is prevention, nurses have more time to interact with the community, so it will be easy to change the behavior of the community by making themselves as the role models. Research about factors associated with the participation of nurses in early detection of cervical cancer is still very minimal in Indonesia. Based on that thing, it should be important to analyze the factors associated with the participation of nurses in the early detection of cervical cancer.

METHODS

Study design

This was a correlational study with cross-sectional design conducted at three hospitals in Bandung city, West Java Indonesia from February to March 2018. Early detection of cervical cancer in this study was similar with pap-smear behavior.

Sample

There were 286 samples were selected using cluster sampling. The inclusion criteria of the sample were female nurses who had been married for at least 1 year. The exclusion criteria were female nurses who were not married, and those who were pregnant.

Instrument

This study used three questionnaires: (1) characteristics of respondent questionnaire, which contained participants' name, address, origin of the hospital, age, marital status, last education level, the number of children, and behavior of pa-smear; (2) Knowledge questionnaire developed by the authors to measure knowledge of cervical cancer with guttman scale. The validity and reliability of the questionnaire have been tested on 34 nurses using the biserial point for validity and KR-20 for reliability. All items have already valid on knowledge questionnaires. The questionnaire was reliable because the reliability coefficient value was greater than 0.6 (KR-20 = 0.75); (3) Health Belief Model questionnaire, which contained 38 statements and self-efficacy containing nine statements have been tested the validity and reliability of data using Pearson and Crombach Alpha. This questionnaires were developed by the authors using Likert scale with references from previous studies (Abotchie & Shokar, 2009; Eze, Umeora, Obuna, Egwuatu, & Ejikeme, 2012; Guvenc, Akyuz, & Acikel, 2011) about health belief model in cervical cancer and pap test.

Ethical consideration

Prior to data collection, this study was approved by the Medical Research Ethics Committee of Universitas Padjadjaran Faculty of Medicine on February 14, 2018 with approval number: 59/UN6.KEP/EC/2018. The authors confirmed that all respondents have obtained an appropriate informed consent.

Data analysis

Univariate analysis was used to find out the frequency of each variable. In the univariate analysis stage, all variables perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, self-efficacy, level of knowledge, nurses' behavior on pap smear and characteristics of respondent were analyzed descriptively (frequency and percentage). For bivariate test, chi-square test or Fisher exact test were used. Logistic regression test was used for multivariate analysis.

RESULTS

Table 1 shows that most of the respondents were less than 40 years old (91.3%), which indicated that they entered the age of fertility category, 18-49 years. Some of the respondents had the last educational level of D-III (58%). Almost all respondents were married (96.6%). Evenly, almost all respondents had less than two children (89.5%). The level of nurses' knowledge pertained high (59.8%) which indicated that most of the nurses knew about cervical cancer and pap-smear. Out of the 286 respondents scattered in three hospitals in Bandung, 253 people (88.5%) stated did not do pap-smear, which indicated the awareness of respondents related to pap-smear was still relatively low.

The six HBM domains showed that 55.9% of respondents had negative perceptions of perceived susceptibility, 80.4% of respondents had positive perceptions of perceived severity, 92% of respondents had positive perceptions of perceived benefit, 54.9% of respondents had negative perceptions of perceived barriers, 58.7% of respondents had negative perceptions of cues to action and 60.8% of respondents had positive perception of self-efficacy.

Table 1 Characteristics of respondents and their correlation with early detection of cervical cancer (pap-smear) (N = 286)

Variable	*f*	%	Pap-Smear Behavior				p-value
			Yes		No		
			f	%	f	%	
Age							
≤40	261	91.3	28	10.7%	233	89.3%	0.145
>40	25	8.7	5	20%	20	80%	
Marital status							
Marriage	282	98.6	32	11.3%	250	88.7%	0.389
Divorce	4	1.4	1	25%	3	75%	
Education level							
SPK	12	4.2	6	50%	6	50%	0.000
Diploma	166	58	16	9.6%	150	90.4%	
Bachelor	108	37.8	11	10.2%	97	89.8%	
Children							
≤2	256	89.5	28	10.9%	228	89.1%	0.253
>2	30	10.5	5	16.7%	25	83.3%	
Knowledge							
Enough	115	40.2	14	12.2%	101	87.8%	0.462
High	171	59.8	19	11.1%	152	88.9%	
Perceived susceptibility							
Negative	160	55.9	3	1.9%	157	98.1%	0.000
Positive	126	44.1	30	23.8%	96	76.2%	
Perceived severity							
Negative	56	19.6	6	10.7%	50	89.3%	0.522
Positive	230	80.4	27	11.7%	203	88.3%	
Perceived benefit							
Negative	23	8.0	1	4.3%	22	95.7%	0.226
Positive	263	92.0	32	12.2%	231	87.8%	
Perceived barrier							
Negative	157	54.9	3	1.9%	154	98.1%	0.000
Positive	129	45.1	30	23.3%	99	76.7%	
Cues to action							
Negative	168	58.7	22	13.1%	146	86.9%	0.214
Positive	118	41.3	11	9.3%	107	90.7%	
Self efficacy							
Negative	112	39.2	8	7.1%	104	92.9%	0.044
Positive	174	60.8	25	14.4%	149	85.6%	

The result of bivariate correlation in **Table 1** also showed that age (p-value = 0.145), marital status (p-value = 0.389), the number of children (p-value = 0.253) and knowledge level (p-value = 0.462) had no significant relationship with pap-smear behavior of nurses at hospitals in Bandung city. Meanwhile, the educational level had a significant relationship with the pap-smear behavior of nurses at hospitals in Bandung (p-value = 0.000). Out of six domains of health belief model, factors that had significant relationship with pap-smear behavior of nurses at hospitals in Bandung were perceived susceptibility (p-value

= 0.000), perceived barriers (p-value = 0.000) and self-efficacy (p-value = 0.000). Factors that had no significant relationship with pap-smear behavior were perceived severity (p-value = 0.522), perceived benefit (p-value = 0.226) and cues to action (p-value = 0.214).

Table 2 Multivariate analysis of factors related to nurse participation in early detection of cervical cancer (N = 286)

Variable	Koef β	SE (B)	p *value*	OR (minimum-maximum)
Perceived susceptibility	2.789	0.634	0.000	16.259 (4.693-56.332)
Perceived severity	2.738	0.635	0.000	15.463 (4.459-53.630)

The correlation strength sequence or relationship of related variables was known from the value of Exp (B) or Odds ratio (OR) using logistic regression analysis. Table 2 shows that the strength of relationship of perceived susceptibility was 16.259 (4.693-56.332), and relationship of perceived barriers was 15.463 (4.459-53.630). The independent variable that had the strongest relationship to the pap-smear behavior was perceived susceptibility domain with OR value of 16.259 (4.693-56.332). The data also showed that respondents with negative perceptions of susceptibility had 16-fold possibility of not doing pap-smear.

The logistic regression coefficient (B) obtained from our analyses could be written into logistic model equation (y = a (constant) + b1x1 + b2x2x), i.e. with y modeling (pap-smear behavior) = 0.324 + 2.789 susceptibility + 2.738 barriers. The logistic regression model equation shows a positive relationship. Pap-smear behavior was affected by perceived susceptibility of 2.789 (27.89%) after controlled by barriers' variable.

DISCUSSIONS

The relationship of respondent characteristics with pap-smear behavior

The results of the analysis using Fisher's Exact Test on the characteristics of respondents obtained age, marital status, the number of children and the level of knowledge had no significant relationship with pap-smear behavior (p-value >0.05). The education level had a significant relationship with pap-smear behavior (p-value <0.05). The results of this study indicated that almost some respondents with age <40 years did not do pap-smear, likewise, the women aged >40 years. Based on age, the incidence of cervical cancer increased at the age of 35 years and over which is a relatively fertile age of women and will decline at the age of menopause (Department of Health, 2007). Whereas almost some respondents enter the age category of sexually active, so it has a possibility of HPV infiltrates easily and develops into cancer. This is supported by the result of the respondents' knowledge level assessment that a small percentage of respondents (20%) had not known the risk factors for cervical cancer. These data are supported by the majority of respondents who had high knowledge (59.8%). However the percentage of respondents with high knowledge (88.9%) and enough knowledge (87.8%) who did not do pap-smear were almost the same. All respondents had sufficient information and knowledge related to cervical cancer and its prevention, but they have not been able to apply it because of several factors such as no facilities and infrastructure that support them in the hospital where they work.

The results of this study also indicated that most of the nurses who were married and had more than two children were more likely not doing pap-smear. It also represented that most nurses have not been able to perform pap-smear because they were unaware of the risk factors for cervical cancer. One of the risk factors for cervical cancer is women who have been sexually active and had over two births. The data showed that 83.3% of respondents had more than two parities included in the at-risk group. This tendency occurs because it is influenced by several factors such as the culture and belief of the nurses to cervical cancer and pap-smear. Respondents had belief and culture that all kinds of examination and treatment related to an intimate organ require the consent of the husband.

Most of the respondents had diploma education (58%), bachelor (37.8%) and SPK (4.2%). Reviewing the level of awareness, most respondents from all levels of education did not perform pap-smear. However, statistically, there was a significant correlation between education level and pap-smear behavior (p-value <0.05). Based on the data obtained, the researcher sees that some of SPK nurses (N = 6) had good ability to do pap-smear because their knowledge levels are high. However, respondents who did not do pap-smear were not influenced by the level of education, but there were barriers that cause them not to do pap-smear. The results of this study were not in line with research conducted in Cimahi, West Java to the society that mentioned the level of education had no significant relationship. Based on the level of awareness, the society has enough awareness of cervical cancer and its prevention. Meanwhile, previous research (Rahayu & Ochoa, 2015) indicated that women or men with a diploma and bachelor education have the same level of awareness of cervical cancer (Rahayu & Ochoa, 2015).

The relationship of perceived susceptibility with pap-smear behavior of the nurses

The results of this study indicated that there was a significant relationship between perceived susceptibility with pap-smear behavior of nurses at hospitals in Bandung (p-value = 0.000). The result of Odd Ratio (OR) analysis obtained value of 16.259 (4.693-56.332) which meant that nurses who had negative perceptions of perceived susceptibility got 16 times more possibility of not doing pap-smear. The data were supported by most respondents who had negative perception toward

perceived susceptibility (55.9%). It was supported by the data that almost all respondents stated they did not feel the signs and symptoms that required them to do pap-smear (91.8%), they did not believe in the presence of HPV (27.3%), and did not feel the need for pap-smear (4.5%). The results of this study were in line with previous research (Yaren, Ozkilinc, Guler, & Oztop, 2008) which also mentioned that 50.4% of nurses did not perform pap-smear because they did not feel the signs and symptoms nor perceive the need for pap-smear.

There could be another factor that affects the individual in doing pap-smear, the culture of Indonesian society who has not realized the importance of preventing disease rather than cure. Nuranna, et al (Nuranna et al., 2012) mentioned that people tend to seek care when individuals have experienced cancer symptoms at an advanced stage, therefore requiring more time and medical expenses. This culture is also experienced by nurses although they have been equipped with knowledge and responsibility to be able to provide a model for the society.

Other data showed that nurses who performed pap-smear because they had a positive perception of susceptibility. Respondents perceived the risk of cervical cancer because they knew that HPV virus is everywhere such as at a public place as a hospital. Workloads cause fatigue and stress that affects the decrease in body immunity is also linked to the risk of cervical cancer. This is what encourages respondents to do pap-smear. Although there are no signs and symptoms that lead to cervical cancer, the nurse has an understanding that HPV virus is everywhere and could have infected them when their immune is low. There is still a sense of responsibility from the nurses to be a role model for the society by doing the pap-smear although there are no symptoms. Prevention is not only done if there is a high risk for cervical cancer. Conversely, pap-smear prevention must be done as one form of responsibility in maintaining a healthy body, especially female reproductive organs. Studies (Beydag, 2011; Ozdemir & Bilgili, 2010; Savas & Taskin, 2011) also mentioned the same thing that the pap-smear behavior is done without symptoms or perceived the risk or possibility of cervical cancer. It is also supported by another study (Zahedi, Sizemore, Malcolm, Grossniklaus, & Nwosu, 2014) which revealed once individuals feel the risk that leads to cervical cancer, the decision to take precautions will soon be done so as to overcome the susceptibility to disease and avoid the severity of the disease, i.e. cervical cancer.

The relationship of perceived barriers with pap-smear behavior of the nurses

The result of chi-square analysis showed that there was a significant correlation between the perceived barrier and pap-smear behavior (p-value = 0.000). The results of the odds ratio analysis (OR) obtained a value of 15.463 (4.459-5.630) which meant that respondents who had negative perceptions of perceived barrier got an opportunity of 15 times more likely not to participate in pap-smear. It was supported by data of respondents with a positive perception of the perceived barrier were more doing pap-smear (23.3%) than respondents with negative perceptions of the barrier to pap-smear (1.9%). Meanwhile, those who had a negative perception of pap-smear barrier (98.1%) were lower in participating in pap-smear than respondents with positive perception (76.7%).

Other barriers presented in this study were feelings of shame, pain and discomfort on examination, feeling lazy, business, no motivation from peers and old enough to do pap-smear. A study (Rahman & Kar, 2015) on health workers in India also stated similarly that 83.4% of respondents did not do pap-smear due to uncomfortable reasons related to pelvic examination (25.1%) and fear of poor results (16.6%). The fear was also considered to contribute because the nurses have known the risks that will arise if suffering cervical cancer, so they did not want to know the results of the examination. Another study (Arulogun & Maxwell, 2012) also explained that 329 non-pap-smear nurses revealed the reasons and perceived barriers such as business (46.5%), fear of results (12.8%), uncomfortable procedures (10.9%) and cost (8.2%). In the meantime, nurses in young age chose not doing pap-smear because they had the belief that cervical cancer does not attack young age, there is no risk leading to cervical cancer, and pap-smear is only shown in old age women.

The results of this study described the barriers perceived by respondents to perform the pap-smear was the opposite sex examiner. Study (Oon et al., 2011) also explained in a qualitative research in women in Malaysia that the perceived barrier was the feeling of shame associated with the examination procedure and the sex of the examiner that tend to be male. The pap-smear examination is performed on the vagina, which is a sensitive area of the woman. Almost all respondents feel the barrier, so choose not to do pap-smear because of cultural factors and beliefs where examination on the vagina to make sense of comfort and need support from the husband.

The relationship of self-efficacy with pap-smear behavior of the nurses

The result of chi-square analysis showed that there was a significant correlation between self-efficacy with the pap-smear behavior of nurses (p-value = 0.044). It was supported by data that there were 253 nurses who did not participate pap-smear (92.9%) because they had a negative perception of self-efficacy. Meanwhile, 33 nurses who participated (14.4%) were having positive perception towards self-efficacy. In other words, perceived negative perception causes nurses not doing pap-smear. This is similar to the study (Abdullah, Aziz, & Su, 2011) which mentioned that poor pap-smear behavior is directly proportional to low self-efficacy level. Another study (Tung, Lu, & Cook, 2010) also mentioned that there is a significant relationship between self-efficacy with the pap-smear behavior of 222 Taiwanese women.

In the context of pap-smear behavior, self-efficacy is illustrated by the ability of a person to perform pap-smear despite internal and external barriers. Study (Tung et al., 2010) showed that when a person has poor efficacy because of poor experiences or other barriers, it affects their ability to make decisions to do a pap-smear. Individuals with poor self-efficacy did not undertake pap-smear because of perceived pain, stress, lack of time and no supportive families. They also claimed to have had

a poor experience of the previous pap-smear. The results of this study also showed that 112 respondents had a negative perception of their ability to perform pap-smear because almost half of the respondents felt unable to commit, overcome perceived barriers and do pap-smear without support. In accordance with Bandura (Bandura, 1994), individuals feeling of the failure experienced is the result of a lack of effort or lack of knowledge and ability to motivate themselves that is still lacking. Low self-efficacy also makes individuals easily give up when faced with obstacles or difficulties, hard to get out of the comfort zone to make a change for themselves and easily depressed. It encourages individuals to become less self-confident in their ability.

The result of logistic regression analysis showed that the strongest factor of the pap-smear behavior of nurses at hospitals in Bandung was perceived susceptibility with the OR value of 16.259, which indicated that the nurses who had negative perception toward perceived susceptibility got 16-fold more possibility of not doing pap-smear.

Limitation of this study

Small sample size in this study may not represent the results of all nurses' behavior in early detection of cervical cancer in Indonesia. Thus, bigger sample size in the future study is needed. In addition, intervention study is also needed to overcome the barriers of pap test.

CONCLUSION

Our findings showed that the participation of nurses in early detection of cervical cancer was low because of several factors associated with the pap-smear behavior: perceived susceptibility, perceived barrier, and self-efficacy. The strongest factor of pap-smear behavior was perceived susceptibility variable with multivariate logistic test indicated that nurses had a 16-fold possibility of not doing pap-smear because they did not feel the signs and symptoms that required them for pap-smear. It is expected that the hospital managers could do another strategy to improve the perception of nurses and encourage them to do early prevention of cervical cancer by both pap-smear and IVA examination. The hospital may also provide female examiner to do pap-smear examination to prevent discomfort among them, as well as to provide facilities and infrastructure for pap-smear examination and cervical cancer treatment.

Declaration of Conflicting Interests

None declared

Acknowledgment

The authors acknowledge all respondents and hospital directors for valuable contribution in this research.

Authorship Contribution

PIRS, **YH** and **TK** designed and drafted the manuscript. All authors agreed with the final version of the article.

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Cite this article as: Suantika, P.I.R., Hermayanti, Y., Kurniawan, T. (2019). Factors associated with participation of nurses in early detection of cervical cancer. *Belitung Nursing Journal, 5*(1): 47-53. https://doi.org/10.33546/bnj.610

Lestari, L., & Ramadhaniyati. (2019). *Belitung Nursing Journal. 5(1): 54-59*
https://belitungraya.org/BRP/index.php/bnj/index

BNJ BELITUNG NURSING JOURNAL

ORIGINAL RESEARCH

MALAY CULTURAL PRACTICE AND CHILDBIRTH WITH TRADITIONAL BIRTH ATTENDANTS: A QUALITATIVE STUDY IN WOMEN OF PRODUCTIVE AGE IN WEST BORNEO INDONESIA

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Article Info:
Received: 5 October 2018
Revised: 7 November 2018
Accepted: 12 November 2018

DOI:
https://doi.org/10.33546/bnj.605

Abstract

Background: The decline in Maternal Mortality Rate (MMR) in developing countries still does not meet the target of Sustainable Development Goals (SDGs). The rise of childbirth with the help of traditional birth attendants and cultural practices still becomes the choice of women of productive age to give birth today.

Objective: This study aimed to explore the Malay culture practice and childbirth with traditional birth attendants in women of productive age in West Borneo, Indonesia.

Methods: This was a phenomenological study conducted on in 2018 in one district in West Borneo. Focus Group Discussion (FDG) was done with eight Malay tribal women who had given birth with the help of Traditional Birth Attendants (TBAs). Thematic analysis was used.

Results: Cultural practices during pregnancy, childbirth and the care of newborns, the services of TBAs, and the economy factor were strong reasons for mothers to choose to give birth assisted by TBAs although they were aware of the risks. This study identified five main themes, namely: 1) Reason for choosing TBAs, 2) TBAs' service, 3) Cultural trust in pregnancy, 4) Cultural trust in labor, and 5) Cultural trust in caring for newborns.

Conclusion: Our findings revealed that culture and childbirth cannot be separated. Health practitioners should have different approach by involving culture and TBAs in childbirth among women of productive age in West Borneo Indonesia.

KEYWORDS
traditional birth attendants; Malay culture; qualitative study; Indonesia

ISSN: 2477-4073

INTRODUCTION

The Maternal Mortality Rate (MMR) in the world is still very high and has not reached the Sustainable Development Goals (SDGs) target of 7.5 percent (Byrne et al., 2016; WHO, 2017). It is estimated that every day 830 mothers in the world die from pregnancy and childbirth whose causes can be prevented, and 99% of these maternal deaths occur in developing countries. Poor women in developing countries do not get adequate delivery services and care, and millions of women in these developing countries undergo childbirth not assisted by trained and certified health workers. Factors of poverty, distance, lack of information, inadequate services, culture, pregnancy at a young age, bleeding, infection, preeclampsia, eclampsia, complications, unsafe abortion, and fear of cesarean are still a trend of MMR contributors in developing countries (Sarker et al., 2016; Sialubanje, Massar, Hamer, & Ruiter, 2015; Titaley, Hunter, Dibley, & Heywood, 2010).

Indonesia is one of the developing countries that still continues to have serious challenges in reducing MMR. Although it had experienced a decline in MMR in 1994 - 2007, the maternal

mortality rate experienced an increase in 2012, which amounted to 359 per 100,000 live births. One of the causes of the high MMR in Indonesia is childbirth which is done at home and is not assisted by professional health workers or in other words labor assisted by traditional birth attendants is 29.6% (Center of Data and Information Center, 2014; Darmstadt et al., 2009). West Borneo is one of the provinces in Indonesia which is the target of the reduction of MMR where the majority of existing indigenous people are members of the Malay tribe. The MMR reduction target is still valid in West Borneo due to the low public awareness of childbirth assisted by health workers, which is 86.46% of the government's target of 89%. West Borneo was ranked ninth with deliveries that were not assisted by professional health workers from 12 provinces in Indonesia which were still the target of a reduction in MMR (Center of Data and Information Center, 2014).

One of the government's strategies in reducing MMR is by improving health services in the first referral health facility (Direktorat Kesehatan Keluarga, 2016). However, the phenomenon that occurs in MMR in the Kubu Raya district is still very high compared to other regions in West Borneo. Delivery assisted by health workers in Kubu Raya district still has not reached the target of 90%, which is only 78.9% or in other words below the standard. Whereas the position of Kubu Raya district is not far from Pontianak City which is the capital of the province of West Borneo. In addition, the declining number of deliveries by health workers since 2014 - 2015 is also a concern of the provincial government of West Borneo (Pembantu Pembina Keluarga Berencana Desa, 2015). The high cultural trust among Malay people in the Kubu Raya district and the ease and comfort with the TBAs service is some of the reasons women choose to give birth assisted by TBAs. Considered unsafe according to modern health sciences, cultural practices and childbirth assisted by many TBAs give a negative influence on the outcome of childbirth, ranging from infections due to unsterile use of equipment and nutritional intake that is not met due to abstinence (Sugrabowo, 2006). With these concerns, this study aimed to explore the experience of women of productive age on Malay cultural practices and TBAs in West Borneo, Indonesia.

METHODS

Study design

This research was conducted using qualitative research methods with a transcendent phenomenology approach (descriptive phenomenology), which aimed to explore Malay cultural practices and traditional birth attendants perceived by women of productive age in West Borneo. Transcendent phenomenology study is a research approach that aims to explore, analyze and describe existing phenomena (Afiyanti & Rachmawati, 2014; Creswell, 2015; Polit & Beck, 2010).

Participants

Participants were given a transportation fee of 4 USD for their participation in each interview. A total of 8 participants were involved in this study with the inclusion criteria: women of productive age (20 - 35 years) who had given birth with the help of TBAs, Malay tribal member, willing to be participants by signing informed consent, and being able to share their experiences with Indonesian or Malay language. Exclusion criteria were: mothers who had given birth were accompanied and assisted by health workers and TBAs at one time, and women who had communication problems. This research was conducted for six months (January - June 2018). One mother had college education qualifications, two mothers reached high school level, two reached junior high school, one had attended elementary school and two had never attended school.

Data collection

Focus Group Discussions (FGD) and semi-structured in-depth interviews were conducted with 8 participants in one group recorded with a voice recorder (with participant permission) and supplemented with field notes. The interviews were conducted in a private, quiet, comfortable and safe location according to the agreement with the study participants, namely at the home of one of the study participants. Interviews were conducted using Indonesian, Malay and everyday English which was understood by participants. Some local terms in Malay which wre used in this study included *beranak* (giving birth), *picit* (massage), *urik / tembuuk* (placenta), *celok* (puncture), and *lopas* (plug). The results of the interviews were transcripts, codes, interpretations to form themes and sub-themes.

Data analysis

Data analysis was done by making transcripts of research results, then the researchers read one-by-one each and every sentence. The interview results were completed with field notes and observations during interviews. This study used the seven stages to make transcripts of interviews to understand the meaning of the phenomena that were told, filter words that were in accordance with the phenomena studied, form keywords, categorize keywords into themes, describe phenomena, make a narrative that is easy to understand from the phenomenon under study and test the validity of the results of the interview (Wilkinson, 2007).

Trustworthiness

The validity of the data was tested in four ways, namely credibility, transferability, dependability, and confirmability. Credibility was done by re-checking the participant interview transcripts for each and every interview. Checking was done to find out if there are sentences that were difficult to understand by researchers. The elusive sentence was asked again to the participants. Credibility was also done by triangulating methods, namely rechecking transcripts with notes from interviews and observations during interviews. Transferability was done by generating verbatim transcripts in the found themes. Dependability was done with external reviewers through analysis of field notes, recordings, observations, analysis of procedure, data synthesis such as coding, themes and interpretation of research results, recording process, and research surveys or interview formats. Confirmation was done by asking for input from qualitative research experts regarding

the results of research transcripts accompanied by data and field notes.

Ethical consideration

This study was approved by the research ethics commission number: 59 / II.I.AU / PUSLITBANGMAS / ST / II / 2018. Written informed consent was obtained from all participants prior to data collection.

RESULTS

This study produced five main themes consisting of: 1) Reasons for choosing TBAs, 2) TBAs service, 3) Cultural trust in pregnancy, 4) Cultural trust in labor, and 5) Cultural trust in caring for newborns.

Reasons for choosing traditional birth attendants

The women in this study revealed their reasons for choosing TBAs as birth attendants were mainly due to economic problems, feeling inferior because they were uneducated, embarrassed if health workers saw their vagina during examination and childbirth, parents' decisions, mother-in-law's decisions, and fear of medical actions such as injection, being sewn and deep examination to examine their vagina by health workers. In addition, participants also expressed the fear of being scolded by health workers if they refused health worker instructions:

> *"... I am a villager, I did not study as school ... so I chose to give birth with a TBA. There is no choice anymore ... no money. My three children gave birth to a child assisted by a TBA. It was a shame too if the health worker saw my vagina, not to mention if injected, our vagina was stitched because it was torn during labor. With a TBA, if we don't want to be seen, stabbed, then she did not see or stab our vagina. When the baby wants to come out, TBA helps us. If you are with a health worker, you cannot refuse. They will be angry. "(P2)*
>
> *"... my mother-in-law decided to give birth at home, assisted by TBAs. My mother-in-law is more convinced to give birth with TBAs because she is more experienced, she said TBAs is better."(P8)*
>
> *"... my mother has said, give birth with the TBAs." (P5)*

TBAs service

Participants in this study revealed the services provided by TBAs when assisting in childbirth, including helping deliveries, massaging after childbirth and cleaning the placenta. This service provides comfort for Malay mothers wo were giving birth.

> *"... giving birth with TBAs is better, we are massaged... we want to give birth to help, continue to give birth... we and the baby are controlled by TBAs every day (visited every day during the puerperium)." (P3)*
>
> *"... our newborn's placenta is washed ... TBAs understand how to clean our newborn's placenta so that our baby doesn't get sick." (P7)*

Participants in this study revealed that communication with TBAs was more flexible than health workers, especially regarding the ability of mothers to pay for childbirth.

> *"... we can pay TBAs properly, TBAs receive 20.000 rupiah (1,5 USD), or 30.000 rupiah too (4.1 USD) ... according to our ability. With health worker, there is a price benchmark, cannot bid. Talking about economic issues is also more flexible with TBAs, we are not ashamed or reluctant. TBAs understand our condition that has no money. If with health worker you want to talk about the economic problem they did not want to know, there is only money. "(P1)*

The majority of participants in this study revealed that they did not get health assistance, especially from the government during labor, which was related to the uneven distribution of the aid.

> *"... others can get help. I can't. What is the difference? Collaboration is odd, but others can help. I can't. Even though there is a data collection but still can't. He said that there was not enough quota from the government. "(P6)*

The mother in this study expressed her disappointment at the inequality of health assistance programs, especially for labor:

> *"... what do we want to say? Already disappointed. If there is, there is, if there is none, then there is nothing left. Just give up. "(P8)*

One participant in this study expressed hope of a government delivery assistance program:

> *"...Free. We think, if we are old, suddenly give birth, how about it, the power is not strong enough. If there is help, it is calm, you can use government assistance to pay for it. "(P2)*

Cultural trust in pregnancy

Culture is very closely related to the life of Malay people in West Borneo. Participants in this study agree with the restrictions that must be done such as not hanging the fabric on the neck while pregnant so that the baby is not wrapped around the umbilical cord, not sitting in front of the door so that the baby is easy to be born and smooth opening, leaving no residual dirt sweeping the house so that the baby is not breech.

> *"... you cannot hang cloth on the neck, he said later the baby can be wrapped around the umbilical cord."(P4)*
>
> *"...you cannot sit at the door of the house, later the child cannot go out during childbirth." (P2)*
>
> *"... sweeping the floor must be clean, rubbish is dumped in place. If not, the child can breech if we sweep uncleanly. "(P1)*

Some participants in this study also revealed other restrictions during pregnancy that mothers had to do. These precautions aim to maintain maternal pregnancy so that it is born safely, such as not crossing the sea or river while pregnant. Crossing a river or sea is believed to cause the baby to suddenly disappear from the womb:

"... can't cross the sea or river, then the child can suddenly disappear in the womb." (P6)

Participants in this study revealed that restrictions should not be over the skin of jackfruit so that the baby is not firmly attached to the womb, so it is easy to be born, do not move into a new house while pregnant so that the baby does not experience any confusion when to exit the womb:

"... can't step on jackfruit skin, then the baby can get stuck in the stomach, it's hard to be born. (P4)

"... can't move house, later the baby will be post mature. So it's longer to give birth. "(P5)

Cultural trust in labor

Participants in this study did abstinence related to cultural practices during childbirth. This abstinence is called the ritual of "killing" the placenta. The placenta is believed to be something that lives in the mother's body after the mother gives birth. The placenta must be killed so as not to eat the mother's heart, which can cause the mother to die. The placenta that has died, is characterized by the easy placenta coming out of the mother's abdomen. Placental killing rituals are performed by prayer reading by the TBAs, then striking the mother's mouth by hand, and sticking the tobacco at the center of the mother's stomach.

"... want to give birth there is a time when the placenta does not want to come out. So prayer must be recited with a TBA, after that our mouth is slapped with the hand, our navel is attached to tobacco, so that the placenta in the stomach dies. The problem is that if the placenta rises to the heart we can die. He (placenta) eats our heart. "(P7)

Other rituals that are performed if the baby or placenta is difficult to be born is to do a prayer reading, then throw eggs, tea, cigarettes, betel into the water with the intention that the mother, baby and placenta are not disturbed by evil spirits that cause the mother difficulty to give birth.

"... for example, it's hard to give birth, we have to do rituals of wasting in river water. Dispose of items such as eggs, tea, cigarettes, betel, said the people so that we won't be disturbed by evil spirits, so giving birth is easy. "(P5)

Cultural trust caring for newborns

The women in this study had three beliefs about placental care for newborns by planting, storing or it being carried away to the river.

"... if I am carried away to a river or sea, culture allows us to choose, to be washed away, to be planted in the ground or stored in a house. "(P7)

The decision to plant, store or wash the placenta into the river is based on certain reasons believed by the participants in this study, and adapted to the wishes of the mother. The placenta that is planted or stored is believed to make children when they are adults, they will not go far from their hometown. The placenta which is washed away into the river is believed to be able to deliver children to explore the world.

"... if the placenta is washed away in the ocean or in the river, when we grow up our children will explore the world. If stored or buried in the soil of the placenta, our children will not go away from us as adults. There is still one village with us, the farthest away."(P1)

Before burying, storing or sweeping away the placenta, participants first clean the placenta with salt, tamarind and clean water. Then the placenta is wrapped in a white cloth. The placenta that is washed is intended to prevent the placenta from rotting, and being surrounded by ants or worms.

"... of descent is like that, culture. So the placenta is washed using salt, tamarind, and water. Washed clean. If it is washed using a lot of tamarind, salt, good, then the placenta is not decayed or fouled. The placenta is wrapped in a white cloth. "(P7)

The placenta that is treated by this way and is stored must be kept from rotting, fouling or surrounded by ants, because it is believed to cause fussy children, runny nose, or stomach ache.

"... if he (baby) is cold or sick, I must have asked his father to see the child's placenta, usually there are maggots. That is what makes a fussy child, a long time to heal."(P8)

"... the point is that if a child is sick, we see the placenta, if there are maggots, surrounded by ants, rotten, surely our children are sick, fussy. If it's like that the placenta must be washed again, it must be cured by our child."(P5)

Participants in this study agreed not to dare to oppose cultural restrictions when treating the placenta, because they were afraid that if they violated the baby's restrictions they would experience pain that could not heal.

"... I am not brave ... the point is that I am not brave, afraid of a child why is it (sick). " (P5)

DISCUSSIONS

This study reveals the reasons for women choosing to give birth assisted by TBAs rather than giving birth with the help of professional health workers and their relation to the culture of Malay tribal communities in the study area. The results of this study indicate that economic problems and parents' or parents-in-law's decisions still have a major role in the decision-making of Malay women giving birth assisted by TBAs. In addition, the women's positive attitude towards the services provided by TBAs also plays an important role in maternal decision making.

The majority of women who choose to give birth with the help of a TBAs have negative thoughts and attitudes towards health workers. This is due to experience, hearing stories about labor experiences from other people who are assisted by health workers or feeling inferior when dealing with health workers, so that they are reluctant to express their needs during childbirth, which is different when giving birth assisted by TBAs (Sialubanje et al., 2015).

The women in this study revealed the perceived comfort in the services provided by TBAs such as massaging a sick mother's body, assisting in childbirth, communication, understanding by the TBAs for the cost of labor and cleaning the baby's placenta. The complaints of women giving birth assisted by health workers to services including complaints of nurses shouting at them, leaving them struggling to give birth alone or not helping them caring for a baby after childbirth (Andrino et al., 2016; Ebuehi & Akintujoye, 2012).

The existence of strong trust in the culture that is owned and the uneven distribution of government support for childbirth assistance costs, further strengthened Malay women giving birth assisted by TBAs. The women also believe that as long as the women abstain from cultural restrictions during pregnancy and childbirth, maternal labor will run smoothly. Likewise, with baby care, mothers believe if the mother cares for the placenta in accordance with the culture that is washing the placenta with water, kitchen salt, tamarind and wrapping the placenta with a white cloth which will be washed away, planted or stored in a jar, then the newborn baby will be healthy. Conversely, if the mother violates these restrictions then the mother believes the disease, flussy children and stomach ache is caused by the decomposing placenta because it is not treated properly. The one of the factors that has an important role in the decision of the mother to give birth and care for newborns is the culture adopted by mothers and families (Titaley et al., 2010).

However, this study may not really represent the experience of giving birth by women, assisted by TBAs from other cultures in Indonesia, with a variety of ethnic groups. It is expected that the other researchers can examine more deeply the experience of childbirth with TBAs from the viewpoint of health workers, women, TBAs, families, and the government in terms of other cultures. Research on placental care for newborns and their relation to maternal cultural beliefs regarding the baby's health status is also deemed necessary.

CONCLUSIONS

Participants in this study provide the evidence of the presence of Malay women who gave birth assisted by TBAs in the today's era although there is a large number of health workers who are available. Economic factors, decision-making policies, uneven government assistance, comfort ratio of health personnel services with TBAs, and culture adopted by Malay tribes are the main reasons for Malay women giving birth assisted by Traditional Birth Attendants.

Declaration of Conflicting Interests

There are no conflict of interest in this study.

Acknowledgment

Tha authors acknowledge all Indonesian organization that provided assistance both materially and morally in this study.

Authorship Contribution

LL & RR: designing the study, collecting and analyzing data, and preparing the manuscript. All authors approved the final manuscript.

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Cite this article as: Lestari, L., & Ramadhaniyati. (2019). Malay cultural practice and traditional birth attendants: A qualitative study in women of productive age in West Borneo Indonesia. *Belitung Nursing Journal.5*(1): 54-59. https://doi.org/10.33546/bnj.605