

# Nurse Media

JOURNAL OF NURSING



Volume 9, Number 2 Year 2019, December 2019

## Articles

- The Difference of Perceived HIV Stigma between People Living with HIV Infection and Their Families
- The Quality of Life of Women with Cervical Cancer in Indonesia: A Cross-Sectional Study
- Increasing Knowledge, Attitudes, Skills, and Glucose Control in Type-2 Diabetic Patients through EMAS Interventions
- Development and Trial of a Paediatric Falls Screening Tool for Use in an Indonesian Context
- The Degree of Diabetic Wounds Affects Kidney Function Damage
- Are Nursing Students' Early Course and Perceived Performance Related to Their Final and Actual Course Performance?
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- Impacts of Manual Handling Training and Lifting Devices on Risks of Back Pain among Nurses: An Integrative Literature Review
- Effects of Early Warning Score (EWS) Tutorial Simulation on Nurses' Knowledge and Clinical Performance

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# **Nurse Media**

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## AIMS AND SCOPE

The Nurse Media Journal of Nursing (NMJN) is an international nursing journal which publishes scientific works for nurses, academics and practitioners. NMJN welcomes and invites original and relevant research articles in nursing as well as literature reviews and case reports particularly in nursing.

This journal encompasses original research articles, review articles, and case studies, including:

- Adult nursing
- Emergency nursing
- Gerontological nursing
- Community nursing
- Mental health nursing
- Pediatric nursing
- Maternity nursing
- Nursing leadership and management
- Complementary and Alternative Medicine (CAM) in nursing
- Education in nursing

## PUBLICATION INFORMATION

The Nurse Media Journal of Nursing (NMJN) is published twice a year, every June and December.

For year 2019, 2 issues (Volume 9, Number 1 (June) and Number 2 (December) are scheduled for publication.

The NMJN is published by the Department of Nursing, Faculty of Medicine, Diponegoro University and available at <http://ejournal.undip.ac.id/index.php/medianers>.

Starting from 2020, the NMJN will be published three times a year, every April, August, and December.

## JOURNAL CITATION

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Total citations in Google Scholar	: 509 (since 2012)
Total articles indexed in IPI	: 99 (since 2014)
Total articles indexed in DOAJ	: 120 (since 2015)
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Total Citations in SINTA	: 508 (since 2017)

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## PREFACE

The Nurse Media Journal of Nursing (E-ISSN: 2406-8799, P-ISSN: 2087-7811) is an open access international journal that publishes the scientific works for nurse practitioners and researchers. The journal is published by the Department of Nursing, Faculty of Medicine, Diponegoro University, and strives to provide the most current and best research in the field of nursing. The journal has been indexed in the Google Scholar, Portal Garuda/Indonesian Publication Index (IPI), Indonesian Scientific Journal Database (ISJD), Directory of Open Access Journal (DOAJ), Science and Technology Index (Sinta), ASEAN Citation Index (ACI) and EBSCO, as well as received an accreditation from the Directorate General of Research Strengthening and Development, Ministry of Research, Technology and Higher Education, Republic of Indonesia. The NMJN has also applied for indexation in Scopus and is currently under revision.

This issue (NMJN, Vol 9(2), 2019) has published ten articles, consisting of seven original research articles, and three reviews. This issue was authored and co-authored by the researchers, academics, and professionals from diverse countries, including Indonesia, Philippines, Australia, Pakistan, Saudi Arabia, Oman, and the United Kingdom. All papers have been double-blindly reviewed by the editors and reviewers of this journal.

The first article (Ibrahim, Kombong, & Sriati, 2019) is a cross-sectional study that examined the difference in perceived HIV stigma between People Living with HIV infection (PLWH) and their families. The study involved 30 PLWH and 30 family members in an HIV clinic of a hospital in West Java Province, Indonesia. The results showed that most PLWH and their families perceived HIV stigma at a moderate level. There was a significant difference in perceived HIV stigma between PLWH and their families. It is recommended that nurses and other health care providers be aware and take a comprehensive assessment-related perceived HIV stigma in order to provide a high quality of nursing care (Ibrahim, Kombong, & Sriati, 2019).

The second article is also a cross-sectional study that evaluated the QOL among 164 women with cervical cancer undergoing treatment (Afiyanti, Wardani, & Martha, 2019). Using the EORTC QLQ-C 30 and QLQ-CX 24 for data collection, the study showed that physical functions and role functions were most frequently reported to affect QOL. Regarding sexual-related symptoms, sexual worry and menopause symptoms were the two most prevalent symptoms which impacted QOL. The study recommends comprehensive, high quality, and culturally sensitive care for women with cervical cancer to be implemented in Indonesia, which has unique social and cultural beliefs (Afiyanti, Wardani, & Martha, 2019).

The third article was a quasi-experimental study that analyzed the effects of EMAS (education, nutrition management, physical activities, and stress management) interventions on the knowledge, attitudes, skills, and glucose control in patients with type-2 DM (Andriyanto, Rekawati, & Rahmadiyah, 2019). The study showed that EMAS interventions significantly increased the knowledge, attitudes, and skills in patients with type 2 diabetes to behave healthier to control their blood sugar. Community nurses can use EMAS interventions for the management of DM among diabetic patients (Andriyanto, Rekawati, & Rahmadiyah, 2019).

The next study (Yulianti et al., 2009) was conducted to develop a culturally-based instrument for paediatric falls prevention. The study was carried out in two phases: composing tool items based on the previous tools and research and the local content, and conducting validity and reliability tests. The instrument, the Paediatric Risk of Falls (PROF) Scale, was tested on 156 paediatric patients in the paediatric ward in a local hospital in Indonesia. The results showed that the PROF Scale demonstrates satisfactory validity and reliability as a scale for assessing falls in pediatric settings in an Indonesian context. However, it needs to be tested in other settings to further test validity and reliability, as well as its application and acceptability (Yulianti et al., 2009).

The fifth study aiming to analyze the relationship between the degree of diabetic wounds and kidney functions in patients with diabetes mellitus (DM), was authored by Windartik et al. (2019). Using a cross-sectional design, the study collected data from medical records of 723 patients who experienced diabetic wounds in a hospital in Indonesia. The results showed that the degree of the diabetic wound was significantly related to kidney function damage. The degree of diabetic injury affects the decline of kidney function in DM patients by 76.8%. It is recommended that nurses do health promotion about controlling blood sugar levels in DM patients with the prevention of four pillars of diabetes, including education, nutrition, physical activity, and stress (Windartik et al., 2019).

In order to investigate the relationship between performance in regular short lecture quizzes and long quiz on the final examination, Oducado (20019) conducted a descriptive-correlational study on 138 second-year nursing students enrolled in the community health nursing course. Grades in short quizzes, long tests, and final examination, as well as results of a one item global scale used to determine students' perceived performance in the final examination, were analyzed and tested using the Pearson's *r* test. Results showed that performance in regular short lecture quizzes ( $p=0.000$ ) and long quiz ( $p=0.000$ ) were significantly correlated with final examination performance. There was a significant relationship between perceived performance and actual performance in the final examination ( $p=0.000$ ) (Oducado, 20019).

The next article was authored by Tuppal, Reñosa, Ninobla, Ruiz, & Loresco (2019). Adopting Norris' method of concept clarification, the study aimed to identify and delineate antecedents, defining attributes, and outcomes of emotional synchrony. Fifty-two sources collected from some electronic databases were included in the inductive thematic analysis. The results showed that emotional synchrony' is a phenomenon of caring integration where an intricate dance through a triadic-synchronistic rhythm of fusion, attunement, and effervescence contribute to the personhood, growth in reflection, and capacity to care. Also, as the emotional synchrony becomes an outward expression of caring, and as a manifestation of healing-caring-moment, the person embodies caring as a mode of being and views all persons as caring (Tuppal, Reñosa, Ninobla, Ruiz, & Loresco, 2019).

The next article was a systematic review that examined challenges in the implementation of inter-professional education (Sulistiyowati & Walker, 2019). Data were collected from electronic databases such as MEDLINE (OVID) 1996, CINAHL, and ERIC (EBSCO), as well as hand searching through the journal of interprofessional care. The included studies were critically appraised using the JBI QARI appraisal tool. Three synthesis findings of-



the challenges in implementing IPE and possible solutions were identified in the literature: inter-professional relationship, IPE curriculum, and administration and resources. Furthermore, the study shows that challenges in the implementation of inter-professional education in developing countries remain similar to those in developed countries. This study can be a guide for developing countries to plan, initiate, and implement interprofessional education (Sulistyowati & Walker, 2019).

The ninth article was an integrative literature review that examined the impacts of manual handling and lifting devices on the risk of back pain among hospital nurses (Aljohani & Pascua, 2019). Using data from electronic databases such as ProQuest, Science Direct, MEDLINE, and CINAHL, the study revealed the importance of manual handling training programs and the consistent use of lifting devices in the prevention of low back pain. Ergonomics training, proper body mechanics and posture, use of body slings, workplace characteristics, availability of equipment and complexity of work, lost workdays including nurses' knowledge, experience, attitude, and compliance are essential factors that impact back pain among nurses. The study recommends hospital organizations to increase their focus on environmental and organization aspects to create a safety culture for safe execution of patient handling and mobility tasks (Aljohani & Pascua, 2019).

The last article was a quasi-experimental study that aimed to determine the effects of Early Warning Score (EWS) tutorial simulation on nurses' knowledge and clinical performance (Damayanti, Trisyani, & Nuraeni, 2019). Involving forty-two respondents each in the intervention group and control group and the intervention of EWS tutorial simulation, the study showed that there was a significant difference in clinical performance between the intervention group and the control group ( $p < 0.001$ ). However, no significant difference in knowledge was found. The EWS tutorial simulation had an effect on increasing nurses' clinical performance. Hence, the EWS tutorial simulation can be used as one of the training methods to increase nurses' knowledge and clinical performance (Damayanti, Trisyani, & Nuraeni, 2019).

Finally, the NJMN would like to thank the respective authors, reviewers, and editors for their contribution and collaboration in publishing this current issue. Furthermore, the editors would like to appreciate and call for academic papers from the nurse-practitioners, academicians, professionals, graduates and undergraduate students, fellows, and associates pursuing research throughout the world to contribute to this international journal.

Semarang, December 2019

Sri Padma Sari

Editor-in-Chief  
The Nurse Media Journal of Nursing

## Author Guidelines

### General Guidelines

Articles sent to the journal are not yet published. To avoid double publication, NMJN does not accept any articles which are also sent to other journals for publication at the same time. The writer should ensure that all members of his/her team have approved the article for publication. Any research report on humans as subject should enclosure the signed informed consent and prior ethical approval was obtained from a suitably constituted research ethics committee or institutional review board. If any financial support was received, or relationship(s) existed, the authors should mention that no conflict of interest of any financial support or any relationship or other, exists during a research project. Those points should mention in the Cover Letter to Editor of NMJN.

The article of research should be written in English on essay format which is outlined as follow:

1. Title Page. This includes: the title of the manuscript, the full names without academic and professional credentials with commas between names. A number (1) is to be used to designate the corresponding author with academic and professional credentials, institutional affiliation(s), postal and e-mail addresses of each author.
2. Abstract. Abstract for research articles, literature review, and case report should use maximum 300 words. Research article should consist of background, purpose, methods, results and conclusion. Abstract is clearly written and is short to help readers get understanding on the new and important aspects without reading the whole article. Keywords are written on the same page with abstract separated each other with semicolon (;). Please use maximum 5 appropriate words for helping the indexing.
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Background provides the state of the art of the study and consists of an adequate background, previous research in order to record the existing solutions/method to show which is the best, and the main limitation of previous research, to show the scientific merit or novelties of the paper. Avoid a detailed literature survey or a summary of the results.
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Polit, D. E., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice* (8th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

**Website**

World Health Organization. (2008). *The global burden of disease: 2004 update*. Geneva, Switzerland: World Health Organization. Retrieved from: [http://www.who.int/healthinfo/global\\_burden\\_disease/GBD\\_report\\_2004update\\_full.pdf](http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf)

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The publication of an article in a peer-reviewed NMJN journal is an essential building block in the development of a coherent and respected network of knowledge. It is a direct reflection of the quality of the work of the authors and the institutions that support them. Peer-reviewed articles support and embody the scientific method. It is therefore important to agree upon standards of expected ethical behavior for all parties involved in the act of publishing: the author, the journal editor, the peer reviewer, the publisher and the society.

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### *Contribution to editorial decisions*

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## **The Difference of Perceived HIV Stigma between People Living with HIV Infection and Their Families**

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### **ABSTRACT**

**Background:** The stigma of HIV and AIDS become a significant barrier to prevention, treatment, and care for HIV infected people. Disclosure of HIV status to the family can help People Living with HIV infection (PLWH) to obtain support and comfort from their family. However, the difference of perceived HIV stigma held by patients and families has become problematic and lead to inadequate responses of PLWH and their families.

**Purpose:** This study aimed to examine the difference in perceived HIV stigma between PLWH and their families.

**Methods:** This was a cross-sectional study involving 60 respondents that consisted of 30 PLWH and 30 family members. They were recruited purposively in an HIV clinic of a residential hospital in West Java Province, Indonesia. The perceived HIV stigma was measured by the Berger's HIV stigma scale (BHSS), and the Liu's Courtesy Stigma Scale (LCSS) was used to measure the perceived HIV stigma at the family level. Data were analyzed using descriptive and inferential analysis (independent t-test) to test the difference in perceived HIV stigma between PLWH and their families.

**Results:** The study found that most PLWH and their families perceived HIV stigma at a moderate level (70% vs. 63.4%, respectively). There was a significant difference in perceived HIV stigma between PLWH and their families ( $t=3.4$ ;  $p=0.001$ ). The PLWH perceived HIV stigma was higher than their family members ( $M=41$ ,  $SD=13.9$  vs.  $M=28.5$ ,  $SD=14.0$ ).

**Conclusion:** This study highlighted that PLWH and their family have different perceptions regarding HIV stigma, which can lead to different responses. Therefore, nurses and other health care providers need to be aware and take a comprehensive assessment-related perceived HIV stigma in order to provide a high quality of nursing care, mainly dealing with HIV stigma for both PLWH and their family members.

**Keywords:** Family, perceived HIV stigma, PLWH

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## **BACKGROUND**

Human Immunodeficiency Virus (HIV) remains a major challenge for health development in many countries. HIV has changed gradually from an acute fatalistic disease to a manageable chronic disease that requires lifelong treatment and care for PLWH (people living with HIV) in order to maintain their health and quality of life (Swendeman, Ingram, & Rotheram-Borus, 2009). Currently, approximately 37.9 million people were living with HIV infection throughout the world (UNAIDS, 2019). Indonesia is a country known as the world's fastest-growing epidemics of HIV from very few people with HIV in 2000 to an estimated 640,000 in 2018 (UNAIDS, 2019). West Java Province is the most populous province in Indonesia, which has a high number of PLWH. It is estimated that there were 36,853 PLWH in West Jawa from 1987 until June 2019, which constituted the third-largest number of PLWH after Jakarta and East Java Province (Ministry of Health Republic of Indonesia [MoHRI], 2019). The increasing number of PLWH has raised the burden on individual, family, and community life and nation development (Ibrahim & Songwathana, 2009). Based on the evaluation of the three 'zero' program; zero new HIV infection, zero HIV discrimination, and zero AIDS-related deaths, those goals have not been successfully achieved globally (UNAIDS, 2017). Discrimination toward PLWH remains to exist in family, community, even in health care settings and institutions. There was evidence that 1 out of 10 PLWH has reported lost their source of income due to their HIV status (UNAIDS, 2017). In addition, free from AIDS-related death has not been achieved successfully; yet it declined to one million in 2016. Therefore, there is an increasing concern if those ambitious goals also could not be achieved in the extension period that has been agreed by the United Nation's country members to be achieved by 2030.

The perception of HIV stigma is a significant barrier in prevention, treatment, and care for PLWH. In India, a study revealed that stigma became a barrier to health and well-being for patients with HIV, especially among HIV infected women (Yakhmi, Sidhu, Kaur, & Dalla, 2014). In Indonesia, a previous study found that some people showed negative attitudes such as refused to eat food provided or sold by PLWH, not allowing their children to play with children of HIV infected parents, not using shared toilets, and refusing to stay close with PLWH (Shaluhiyah, Musthofa & Widjanarko, 2015).

PLWH encountered not only physical problems related to the disease but also social problems as a consequence of bearing the disease. The perception toward HIV stigma can be referred to as the assessment of people who are HIV infected, which includes negative attributes or characteristics by which they are treated differently from other community members (Earnshaw & Chaudoir, 2009). As the perception of HIV stigma was held by PLWH themselves, it could hinder PLWH from getting access to health care services (Swendeman et al., 2009). The HIV stigma perception of PLWH, or in another term called as personal stigma, is a negative perception of PLWH about themselves that linked to the community's view on HIV as a deadly disease or dirty disease associated with free sex or illegal sexual relation (Earnshaw & Chaudoir, 2009).

Family is the first line and the closest social environment where HIV infected people live. Family is expected to give support and comfort when their member was diagnosed with HIV and experienced its signs and symptoms throughout the disease process.

However, some families of PLWH showed negative attitudes and discriminating behaviors when they knew their member was HIV positive. HIV stigma at a family level can be an external stigma that may contribute to a higher perceived stigma by PLWH. Family stigma represents a negative view of the family toward PLWH, which leads to discrimination behaviors due to disease status (Greeff et al., 2008). Cultural related factors and family's functioning and development are also influencing factors to the perceived HIV stigma among family members (De Wet, Du Plessis, & Klopper, 2013). The different perceptions of HIV stigma between PLWH and their family may also inhibit PLWH to disclose their HIV status to family members due to fear of rejection and discrimination by family members (Gari, Habte, & Markos, 2010). In fact, disclosing HIV status is very important to plan appropriate treatment, care, and support for PLWH. Understanding perceptions of HIV stigma between PLWH and their families become a crucial element for designing appropriate interventions in caring for PLWH and their families.

## **PURPOSE**

This study aimed to examine the differences in perceptions of HIV stigma between PLWH and their families.

## **METHODS**

### **Design and sample**

The study used a cross-sectional design with a comparative method approach. Thirty PLWH and 30 family members were recruited purposively to participate in this study. Inclusion criteria for being a PLWH respondent were their age  $\geq 18$  years, or adult, be able to read, write, and communicate well in Bahasa Indonesia, and not suffering from mental disorders. Meanwhile, family members involved in this study were those who live with patients in the same household for at least one month, knowing the patient's HIV status, able to read, write, and communicate well in Bahasa Indonesia.

### **Ethical consideration**

Ethical approval of the study was obtained from the Health Research Ethics Committee of the Faculty of Medicine, Universitas Padjadjaran (Letter number: 057/UN6.KEP/EC/2018). Permission to collect the data was granted by the hospital director, where the study took place. Ethical principles were assured not to be violated throughout the study process.

### **Measurement**

The perception of HIV stigma on PLWH was measured by using Berger's HIV stigma scale - Indonesian version (BHSS-I), which has been translated and validated by Nurdin (Berger, Ferrans, & Lashley, 2001; Nurdin, 2013). The BHSS-I has a Cronbach's alpha coefficient of 0.94 for a total score of 40 items, and 0.81 to 0.92 for sub-scales, indicating that the instrument has strong validity and reliability. The BHSS-I measured personal stigma, status disclosure, negative self-image, and public attitudes. It consisted of 40 items with a 4-point ordinal response scale ranging from strongly disagree, disagree, agree, and strongly agree. The total lowest score was 40, and the total highest score was 160. The total score was then categorized into three levels: mild (40-80), moderate (81-120), and severe (121-160) (Charles et al., 2012; Li & Sheng, 2014).

Construct validity of the BHSS was supported by relationships with related constructs: self-esteem, depression, social support, and social conflict. Coefficient alpha was 0.96 meaning that the instrument has high internal consistency reliability (Berger et al., 2001).

Family's perception regarding HIV stigma was measured by using Liu's Courtesy Stigma Scale (LCSS); it measured both public and self-perceived stigma (Liu, Xu, Sun, & Dumenci, 2014). It consisted of 22 items with a 4-point ordinal response scale from strongly disagree, disagree, agree, and strongly agree. The total score ranged from 22 to 88, which was divided into three levels: mild (22-40), moderate (41-60), and heavy (61-88) (Singh, Chaudoir, Escobar, & Kalichman, 2011). The Cronbach's alpha coefficient of the original LCSS was between 0.83 to 0.90, which was considered as reliable instrument with good construct validity. The original questionnaire was written in English; therefore, it was translated into Bahasa Indonesia using a back-translation technique by experts who are fluent in both languages. The translated instrument was reviewed and modified in order to fit with the targeted population.

### Data analysis

In the univariate level, data were analyzed by calculating frequency and percentage for each level of perceived stigma and its components for both PLWH and family respondents. In the bivariate level, an independent t-test was employed to examine the differences in perceived stigma between PLWH and family. Before comparing the means scores of perceived HIV stigma between PLWH and family, each data score was transformed into 100 formula ( $\text{score } 100 = 100 \times (\text{individual score} - \text{lowest score}) / \text{range}$ ) for each respondent (McDowell, 2006).

## RESULTS

### Demographic characteristics of respondents

The study involved 60 respondents that consisted of 30 PLWH and 30 family members. Respondents of PLWH were predominantly 26-35 years of age group, male, completed junior high school, self-employed, unmarried, Muslim, and on Antiretroviral Treatment (ART) medication. Moreover, the family member group was dominated by 26-35 years of age group, female, completed junior high school, self-employed, married, Muslim, and in a family relationship as a parent (Table 1).

*Table 1. Demographics characteristics of respondents (n= 60)*

Characteristics	PLWH (n=30) f (%)	Family (n=30) f (%)
Age (Years)		
18 – 25	9 (30)	7 (23.3)
26 – 35	15 (50)	14 (46.7)
36 – 45	6 (20)	9 (30)
Sex		
Female	7 (23.3)	16 (53.3)
Male	23 (76.7)	14 (46.7)
Education		
Elementary School	6 (20)	7 (23.3)

Characteristics	PLWH (n=30) f (%)	Family (n=30) f (%)
Junior High School	8 (26.7)	13 (43.3)
Senior High School	12 (40)	8 (26.7)
Academic/University	4 (13)	2 (6.7)
<b>Occupation</b>		
Self-employed	24 (80)	14 (46.7)
Private employee	3 (10)	3 (10)
Housewife	3 (10)	13 (43.3)
<b>Marital Status</b>		
Married	6 (20)	20 (66.6)
Unmarried	21 (70)	8 (26.7)
Widower/Widow	3 (10)	2 (6.7)
<b>Religion</b>		
Islam	30 (100)	30 (100)
Non Islam	0 (0)	0 (0)
<b>ART medication</b>		
Yes	30 (100)	-
No	0 (0)	-
<b>Family Relationship</b>		
Parents	-	9 (30)
Spouse (Husband-Wife)	-	7 (23.3)
Sibling (Younger – Older)	-	8 (26.7)
Children	-	6 (20)

### Perceived HIV stigma

Table 2 presents the level of perceived stigma and its components between PLWH and family. Most PLWH respondents and family perceived stigma within a moderate level. Personal stigma was dominated by the stigma component among PLWH, while the proportion of self-perceived stigma was higher than public stigma among family respondents.

*Table 2. Level of perceived HIV stigma and its' components between PLWH and families (n=60)*

Perceived HIV stigma	Mild f (%)	Moderate f (%)	Heavy f (%)
<b>PLWH:</b>			
Overall	9 (30)	21 (70)	0 (0)
Personal stigma	8 (26.7)	22 (73.3)	0 (0)
Status disclosure	10 (33.3)	20 (66.7)	0 (0)
Negative self-image	9 (30)	21 (70)	0 (0)
Social attitudes	9 (30)	19 (63.3)	2 (6.7)
<b>Family:</b>			
Overall	11 (36.6)	19 (63.4)	0 (0)
Public stigma	20 (66.7)	10 (33.3)	0 (0)
Self-perceived stigma	19 (63.3)	11 (36.7)	0 (0)

Because of the different number of items between the BHSS and LCSS, in order to make it appropriate for comparison, the raw data of each respondent were transformed

into a 100-formula. The mean score, standard deviation, and range for each group were calculated before and after transformation (Table 3).

*Table 3. Transformation of data score of perceived HIV stigma between PLWH and families*

	Mean	SD	Range
PLWH:			
Before transformed	89.2	16.7	58 – 115
After transformed	41	13.9	15 – 63
Family:			
Before transformed	40.9	9.3	22 – 57
After transformed	28.5	14.0	0 – 53

### **The difference of perceived HIV stigma between PLWH and families**

Before comparing the means score between PLWH and family groups, the researchers conducted a normality test using the Shapiro Wilk technique. The test revealed p-value = 0.63 for PLWH, and 0.31 for the family, which could be concluded that the data were normally distributed ( $p > 0.05$ ). The homogeneity test was performed by using Levene's test and the result showed p-value=0.997 ( $> 0.05$ ), which indicated that there was a similarity of variances or homogeneity was assumed. The steam-leaf and box-plot were checked, and the results showed none outlier data were identified. Therefore, all assumptions of independent t-test have been met. The result found that there was a significant difference in perceived HIV stigma between PLWH and their families ( $p > 0.05$ ), with a mean score of PLWH was higher than their family (Table 4).

*Table 4. The difference of perceived HIV stigma between PLWH and families*

Perceived stigma	Mean	SD	<i>t</i>	<i>p</i>
Overall score:				
PLWH	41	13.9	3.4	0.001
Family	28.5	14.0		

## **DISCUSSION**

HIV-related stigma is still prevalent among society, although much significant progress has been made in the medical treatment of the disease. The stigma attached to HIV/AIDS is even considered being higher than other diseases such as leprosy, which caused bodily disability (Stevelling, Van Brakel & Augustine, 2011). It is due to negative views and judgments on individuals' behaviors who contracted the disease (Lindberg, Wettergren, Wiklander, Svedhem-Johansson, & Eriksson, 2014). Stigma toward HIV may occur at various levels, including personal, family, community, and public levels.

On the other hand, the stigma can also exist in different settings such as education, workplaces, health care services, even in legal and policy institutions. This study found that most PLWH respondents and their families perceived HIV stigma at a moderate level. The stigma component among PLWH dominated personal stigma. This is relevant to previous studies in China and India reporting that most of PLWH respondents in the

studies rated their HIV stigma as a moderate level (Li & Sheng, 2014; Gohain & Halliday, 2014). Stigma can be changed in many ways, but the most popular intervention is by educating people with accurate information and knowledge about HIV through multiple channels of educational media.

Considering that nowadays there are many media available that provide information and knowledge related to HIV and easily accessible by the public, it has likely succeeded in improving the public's knowledge about HIV and reducing HIV stigma level compared to the beginning era of the HIV epidemic. However, it did not totally eradicate the stigma; it is remaining to exist though in the level of moderate and lower. Personal stigma was found as the highest number compared to other stigma elements among PLWH in this study. Personal stigma, or in another term known as internal stigma refers to thoughts and behaviors came from negative perceptions of his/her own individuals which are an essential part of mental health for individuals' adaptation in their life (Kalichman et al., 2009). Perceived internal stigma can be manifested in forms of feeling shame, guilty, lonely, or depressed that make individuals isolated from others (Cameron et al., 2011; Nachege et al., 2012). In this study, personal stigma was higher than other elements within a moderate level; however, the range among these stigma elements is not very wide. It means PLWH have all stigma elements that contributed to their perception of HIV stigma. In the family group, the proportion of the moderate level of self-perceived stigma was higher than public stigma. It is similar to a study from Vietnam that found perceived HIV stigma by the family of PLWH was dominantly moderate (Lundberg et al., 2016). Public stigma can be understood as the attitudes or reactions that the general people demonstrate to PLWH as felt by the family of PLWH. In contrast, the self-perceived stigma refers to the fear of societal attitudes and potential discrimination perceived by the family who have a family member with HIV/AIDS (Liu et al., 2014). Self-perceived stigma was identified as a higher proportion because the family seemingly has more thought about the stigma rather than their real experience of encountering stigma from the community.

This study revealed a significant difference in perceived HIV stigma between PLWH and their families; the mean score of PLWH was higher than their families. This finding is congruent to a previous study reporting that there was a difference in perceptions toward HIV stigma between PLWH and their family, where PLWH had 2.5 times higher perceived HIV stigma than their family (Liu, Xu, Lin, Shi, & Chen, 2013). Different perceptions related to HIV stigma may be associated with different levels of education, route of transmission, beliefs, and views regarding HIV and AIDS (Li & Sheng, 2014; Ibrahim & Songwathana, 2009). In this study, the majority of PLWH respondents completed senior high school. Although it is not clear the correlation between formal education and level of knowledge about HIV and AIDS, there was evidence that most PLWH in a district hospital in West Java, have lower health literacy (Kesumawati, Ibrahim, Witdiawati, 2019). Health literacy is one of the important factors that influence the perception and behaviors of PLWH. Another study in Bandung, West Java, found that PLWH in a Muslim community perceived HIV and AIDS as a deadly, dirty, and horrifying illness due to deviant behaviors of free sex, or using illicit drugs as the risk factors of getting HIV infection (Ibrahim, 2010). It reflected the influence of cultural beliefs and the context of Islamic teaching that



emphasized prohibiting free sex and taking illicit drugs that is considered as a big sin. It is relevant to a previous study highlighting the influence of family race, cultural values, and religious and spiritual values on HIV stigma in South Africa (Brown, BeLueb, & Airhihenbuwa, 2010). Perceived HIV stigma of PLWH that is higher than the family often hinder PLWH to disclose their status to their family. Ibrahim, Rahayuwati, and Herliani (2019) reported their qualitative findings, which outlined four major themes as reasons for PLWH not to disclose their HIV status to their family. They were (1) negative feelings about being an HIV-infected person, (2) feeling fear of being rejected by family members, (3) avoiding being a burden on the family, (4) desiring to maintain a good relationship with family members. These reasons may also relate to high perceived stigma among PLWH; in fact, it may or may not be the same as the family perceived.

Family is a social structure and environment that closest to PLWH. Impacts of being HIV infected people are not only experienced by PLWH themselves but also experienced by their family members. Goffman (as cited in Liu et al., 2014) pointed out that perceived or experienced stigma could be passed on to family members of those with the stigmatizing attributes. It was named as “courtesy stigma” which refers to a person who perceives or experiences stigmatization due to their association with a person who accepts the punished attribute. Courtesy stigma causes feelings of social isolation, shame, and fear, and introduces additional stressors to HIV-uninfected family members of PLWH. In this regard, the family of PLWH also becomes the subject of stigmatization. This study found that there were two types of perceived stigma that may exist in the family of PLWH, they were public stigma, which was real stigmatization received by the family from neighbors or community, and self-perceived stigma, which was family’s perception toward their family members infected by HIV. It can be manifested through discriminating behaviors, responses, negative feelings, and isolation toward PLWH. Nurses as the front line of health care providers who have close contact with PLWH and their families need to have a better understanding of HIV stigma perceived by PLWH and their family.

This study has limitation for generalization to all PLWH population. It is due to only involved one site of HIV clinic and the samples were not recruited randomly. However, this study provide evidence that PLWH and their family have different perceptions regarding HIV stigma, which can lead to different responses.

## **CONCLUSION**

This study found that most PLWH and their families have perceived HIV stigma at a moderate level. Personal stigma was a higher type of stigma elements reported by PLWH respondents, whereas in the family respondents found that the proportion of self-perceived stigma was higher than public stigma. There was a significant difference in perceived HIV stigma between PLWH and their family with a mean score of PLWH was higher than their family. This study recommends nurses and health care providers to be aware and take a comprehensive assessment-related perceived HIV stigma in order to provide a high quality of nursing care, mainly dealing with HIV stigma for both PLWH and their family members. It would be challenging for further study to cover a wider multisite study with random sampling method validate the results of the study.

Further study is also needed to investigate factors associated to the difference perceived stigma between PLWH and their family in order to address in developing nursing interventions.

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#### **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

#### **REFERENCES**

- Berger, B. E., Ferrans, C. E., & Lashley, F. R. (2001). Measuring stigma in people with HIV: psychometric assessment of the HIV stigma scale. *Research in Nursing & Health, 24*(6), 518-529. Doi: 10.1002/nur.10011
- Browna, D.C., BeLueb, R., & Airhihenbuwaa, C.O. (2010). HIV and AIDS-related stigma in the context of family support and race in South Africa. *Ethn Health, 15*(5), 441-458. doi:10.1080/13557858.2010.486029
- Cameron, S. (2011). People Living with HIV Stigma Index: Asia Pacific Regional Report 2011. UNAIDS. Retrieved on June 20th 2019 from [https://www.aidsdatahub.org/sites/default/files/documents/People\\_Living\\_with\\_HIV\\_Stigma\\_Index\\_Asia\\_Pacific\\_Regional\\_Report\\_2011.pdf](https://www.aidsdatahub.org/sites/default/files/documents/People_Living_with_HIV_Stigma_Index_Asia_Pacific_Regional_Report_2011.pdf)
- Charles, B., Jeyaseelan, L., Pandian, A. K., Sam, A. E., Thenmozhi, M., & Jayaseelan, V. (2012). Association between stigma, depression and quality of life of people living with HIV/AIDS (PLHA) in South India—a community-based cross-sectional study. *BMC Public Health, 12*(463), 1-11. doi:10.1186/1471-2458-12-463
- De Wet, G. E., Du Plessis, E., & Klopper, H. C. (2013). HIV-positive patients' and their families' comprehension of HIV-and AIDS-related information. *Health SA Gesondheid (Online), 18*(1), 1-11. doi:10.4102/hsag.v18i1.597
- Earnshaw, V. A., & Chaudoir, S. R. (2009). From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. *AIDS and Behavior, 13*(6), 1160-1177. doi:10.1007/s10461-009-9593-3
- Gari, T., Habte, D., & Markos, E. (2010). HIV positive status disclosure among women attending art clinic at Hawassa University Referral Hospital, South Ethiopia. *East African Journal of Public Health, 7*(1), 87-91.
- Gohain, Z., & Halliday, M. A. L. (2014). Internalized HIV-stigma, mental health, coping and perceived social support among people living with HIV/AIDS in Aizawl District—A pilot study. *Psychology, 5*(15), 1794-1812. doi:10.4236/psych.2014.515186
- Greeff, M., Phetlhu, R., Makoae, L. N., Dlamini, P. S., Holzemer, W. L., Naidoo, J. R., ... & Chirwa, M. L. (2008). Disclosure of HIV status: experiences and perceptions of persons living with HIV/AIDS and nurses involved in their care

- in Africa. *Qualitative Health Research*, 18(3), 311-324. doi:10.1177/1049732307311118
- Ibrahim, K. (2010). *Muslim cultural care for people living with HIV infection*. (Unpublished PhD Thesis). Prince of Songkla University, Thailand.
- Ibrahim, K., & Songwathana, P. (2009). Cultural care for people living with HIV/AIDS in muslim communities in Asia: A literature review. *Thai Journal of Nursing Research*, 18(2), 148-157.
- Ibrahim, K., Rahayuwati, L., & Herliani, Y.K. (2019). Barriers to disclose HIV status to family members among People Living with HIV. *Jurnal Keperawatan Soedirman*, 14(2), 96-102.
- Kalichman, S. C., Simbayi, L. C., Cloete, A., Mthembu, P. P., Mkhonta, R. N., & Ginindza, T. (2009). Measuring AIDS stigmas in people living with HIV/AIDS: The internalized AIDS-related stigma scale. *AIDS Care*, 21(1), 87-93. doi:10.1080/09540120802032627.
- Kesumawati, R., Ibrahim, K., and Witdiawati, W. (2019). Literasi kesehatan orang dengan HIV/AIDS [Health literacy among people with HIV/AIDS]. *Jurnal Pendidikan Keperawatan Indonesia*, 5(1), 77-88
- Li, Z., & Sheng, Y. (2014). Investigation of perceived stigma among people living with human immunodeficiency virus/acquired immune deficiency syndrome in Henan province, China. *International Journal of Nursing Sciences*, 1(4), 385-388. doi:10.1016/j.ijnss.2014.10.019.
- Lindberg, M. H., Wettergren, L., Wiklander, M., Svedhem-Johansson, V., & Eriksson, L. E. (2014). Psychometric evaluation of the HIV stigma scale in a Swedish context. *PloS One*, 9(12). doi:10.1371/journal.pone.0114867.
- Liu, H., Xu, Y., Lin, X., Shi, J., & Chen, S. (2013). Associations between perceived HIV stigma and quality of life at the dyadic level: The actor-partner interdependence model. *PLoS One*, 8(2), e556860. doi:10.1371/journal.pone.0055680
- Liu, H., Xu, Y., Sun, Y., & Dumenci, L. (2014). Measuring HIV stigma at the family level: Psychometric assessment of the Chinese Courtesy Stigma Scales (CCSSs). *PloS One*, 9(3), e92855. doi:10.1371/journal.pone.0092855
- Lundberg, P. C., Doan, T. T. K., Dinh, T. T. X., Oach, N. K., & Le, P. H. (2016). Caregiving to persons living with HIV/AIDS: Experiences of Vietnamese family members. *Journal of Clinical Nursing*, 25(5-6), 788-798.
- McDowell, I. (2006). *Measuring health: A guide to rating scales and questionnaires* (1st eds). NY: Oxford University Press.
- Ministry of Health Republic of Indonesia (MoHRI). (2019). *Laporan perkembangan HIV-AIDS dan Penyakit Infeksi Menular Seksual (PIMS) Triwulan II tahun 2019 [Report on the progress of HIV-AIDS and Sexual Transmitted Diseases in the quarter II-2019]*. Jakarta: Direktorat Jenderal Pencegahan dan Pengendalian Penyakit, Kemenkes RI.
- Nachega, J. B., Morroni, C., Zuniga, J. M., Sherer, R., Beyrer, C., Solomon, S., ..., & Rockstroh, J. (2012). HIV-related stigma, isolation, discrimination, and serostatus disclosure: A global survey of 2035 HIV-infected adults. *Journal of the International Association of Physicians in AIDS Care*, 11(3), 172-178. Doi: 10.1177/1545109712436723

- Nurdin, A. (2013). *Uji validitas dan reliabilitas Berger HIV Stigma Scale versi Bahasa Indonesia dalam menilai perceived stigma pada orang dengan HIV/AIDS (ODHA) [Testing the validity and reliability of Berger HIV Stigma Scale Indonesia Version to evaluate perceived stigma among people living with HIV/AIDS]*. (Medical Specialty Thesis). Universitas Indonesia, Jakarta, Indonesia.
- Shaluhayah, Z., Musthofa, S. B., & Widjanarko, B. (2015). Community stigma towards people living with HIV / AIDS. *Public Health: National Public Health Journal*, 9(4), 333-339. doi:10.21109/kesmas.v9i4.740.
- Singh, D., Chaudoir, S.R., Escobar, M.C., & Kalichman, S. (2011). Stigma, burden, social support, and willingness to care among caregivers of PLWHA in home-based care in South Africa. *AIDS Care*, 23, 839-845. doi:10.1080/09540121.2010.542122
- Stevelink, S. A. M., Van Brakel, W. H., & Augustine, V. (2011). Stigma and social participation in Southern India: Differences and commonalities among persons affected by leprosy and persons living with HIV/AIDS. *Psychology, Health & Medicine*, 16(6), 695-707.
- Swendeman, D., Ingram, B. L., & Rotheram-Borus, M. J. (2009). Common elements in self-management of HIV and other chronic illnesses: an integrative framework. *AIDS Care*, 21(10), 1321-1334. doi:10.1080/09540120902803158.
- UNAIDS (2017). *Global AIDS monitoring*. Geneva: UNAIDS. Retrieved from [https://www.unaids.org/sites/default/files/media\\_asset/2017-Global-AIDS-Monitoring\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/2017-Global-AIDS-Monitoring_en.pdf)
- UNAIDS (2019). *Global HIV & AIDS statistics – 2019 fact sheet*. Retrieved on December 20th, 2019 from <https://www.unaids.org/en/resources/fact-sheet>
- Yakhmi, S., Sidhu, B. S., Kaur, B., & Dalla, E. K. (2014). Study of HIV related stigma in people living with HIV/AIDS (PLHA): Role of gender differences. *Indian Journal of Scientific Research*, 5(2), 35.

## **The Quality of Life of Women with Cervical Cancer in Indonesia: A Cross-Sectional Study**

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### **ABSTRACT**

**Background:** Cervical cancer have significant impacts on the quality of life (QOL) of the women experiencing it. Limited studies are exploring QOL among Indonesian women diagnosed with cervical cancer.

**Purpose:** This study aimed to investigate the QOL of women with cervical cancer who received radiation therapy and chemotherapy.

**Methods:** A cross-sectional study was conducted to evaluate the QOL among 164 women with cervical cancer undergoing treatment. A consecutive sampling technique was used to recruit the samples. The EORTC QLQ-C 30 and QLQ-CX 24 were used to measure the QOL and sexual-related symptoms. The data collected were analyzed and presented as descriptive statistics in the form of means and standard deviations.

**Results:** The mean of the global health status of general well-being and QOL of the women was  $54.56 \pm 25.47$ . In the QOL subgroups of functional status, the physical function (55.94) and role functions (55.34) were most frequently reported to affect QOL. Regarding sexual-related symptoms of the women, sexual worry (52.72) and menopause symptoms (48.03) were the two most prevalent symptoms which impacted QOL.

**Conclusions:** The quality of life of women with cervical cancer in Indonesia was generally at the higher end of the scale, and yet the majority of the women reported high prevalent symptoms of cancer and adverse effects of treatments. Comprehensive, high quality and culturally sensitive care for women with cervical cancer needs to be implemented in Indonesia, which has unique social and cultural beliefs.

**Keywords:** Cervical cancer; quality of life; sexual and sexuality; women

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### **BACKGROUND**

Cervical cancer is one of the most prevalent cases among cancer cases in women. Cervical cancer significantly impacts the lives of women and their quality of life as its symptoms and treatment affect their physical, mental, and social well-being. The mainstream cancer treatment, including chemotherapy and radiotherapy, have a range of

adverse effects which adds to the physical and psychological burden of the patients and families (Wenzel, Vergote, & Cella, 2003). An assessment is, therefore, necessary to determine the level of impact on women's well-being. One of the most referred indicators is the quality of life of women with cervical cancer.

Quality of Life (QOL) has always been an important goal in the decades of developing the treatment of cancer. In women with cervical cancer, concerns such as the changes in body image and emerging physical problems because of the illness symptoms may lead to psychological problems. Over the years, many studies have been conducted to explore the quality of life of women with cervical cancer as well as its influencing factors (Garssen, Vos, de Jager Meezenbroek, de Klerk, & Visser, 2011; Vistad, Fossa, & Dahl, 2006). It can be concluded that treatments of cancer may decrease the quality of life in patients despite the many options of treatments available in the present years. A study also proved that the quality of life of cancer patients was also influenced by other factors such as economic background, social status, and disease-related factors (Pradjatmo, Nisman, & Fatmawati, 2017).

Another aspect of cervical cancer patient's well-being is the sexual-related symptom, i.e., sexuality and sexual activities. Cervical cancer profoundly affects the reproductive system of women, often resulting in sexual dysfunction. Vaginal dryness, stenosis, and dyspareunia have been reported among survivors who had undergone surgery, radiation, and chemotherapy (Huffman, Hartenbach, Carter, Rash, & Kushner, 2016). It is an existing problem in women with cervical cancer, which can negatively affect the general quality of life.

Presently, studies of quality of life of women with cancer in Indonesia are still limited in number (Afiyanti, Martha, Wardani, & Andrijono, 2018; Afiyanti, Milanti, & Putri, 2018). On the other hand, according to the available information, Indonesia is one of the developing countries in Asia with a high incidence and mortality rate of cervical cancer cases (Ministry of Health Republic of Indonesia, 2015). Studies about quality of life are vital as evidenced where the improved quality of life of the cancer patients during the treatment process may increase patients' adherence to treatment and help them to remain strong in overcoming their symptoms (Perwitasari et al., 2011). Further research on the topic of quality of life of cervical cancer patients in Indonesia is urgently needed.

## **PURPOSE**

This study aimed to investigate the quality of life among women with cervical cancer in Indonesian undergoing radiation therapy and chemotherapy.

## **METHODS**

### **Design and samples**

This study employed a descriptive cross-sectional research design. The sample size was calculated using the formula for descriptive studies with the aid of OpenEpi Version 3.0, an open-source calculator. The sample size generated was 164. Participants were selected through a consecutive sampling method. The study recruited 182 women with cancer undergoing treatment between April to August 2015. Of the 182 women

recruited, 10 of the women were patients of other types of cancer. One hundred and seventy-two women were eligible for the study, of which, three women declined to participate, and 5 participants did not finish the questionnaire, resulting in 164 participants (95% response rate).

The eligibility criteria were: (1) women diagnosed with cervical cancer; (2) under the age of 60 years, (3) able to read and write; (4) undergoing chemotherapy and radiation treatment in the gynecology oncology ward and clinic in the respective hospitals, and (5) expressed willingness to participate in the study. The participants were approached by the research team with permission from respective hospitals. Participants were provided relevant information about the study before signing the informed consent.

The study was conducted in three different hospitals with a gynecology oncology ward and outpatient clinic in different provinces in Indonesia, namely Bandung Hasan Sadikin Hospital in West Java, Margono Hospital in Central Java, and Wahidin Sudiro Husodo Hospital in Makassar, South Sulawesi.

### **Ethical consideration**

The research was submitted to the Institutional Review Board, Research Ethics Committee of the Faculty of Medicine and the Faculty of Nursing, Universitas Indonesia, to obtain permission and had been approved (No.525/UN2.F1/ETIK/2015 and No. 0318/UN2.F12D/HKP.02.04/2015). All participants have given their informed consent prior to their participation in this study. This study adhered to the ethical principles of research, including the right to self-determination, patients' anonymity, and confidentiality. All participants' data were handled with the strictest confidence.

### **Research instrument and data collection**

The participants were asked to complete two sets of questionnaires. The first questionnaire was social demographic information developed by the researchers. Sociodemographics data identified in the study were age, work status, educational level, marital status, and stage of disease based on the FIGO (Fédération Internationale de Gynécologie et d'Obstétrique) classification determined by the International Federation of Gynecology and Obstetrics. For cervical cancer, the staging started from stage IA to IVB with no stage 0. The second questionnaire was the instrument to assess participants' quality of life. It consisted of 2 different parts: European Organization of Research and Treatment of Cancer Quality of Life Q-30 (EORTC QLQ-C30) and the Quality of Life Questionnaire Module Cervical Cancer (EORTC QLQ-CX24).

The EORTC QLQ-C30 consists of 30 questions with 28 questions in a four-point Likert-style evaluation and two questions (q29 and q30) evaluated through a scale of 1 to 7 (1=very bad, 7= excellent. The scale assesses five functionality dimensions, i.e., physical, role, emotional, cognitive, and social functions, as well as several prevalent symptoms. A high score for the global health status/QOL represents a high QOL. Similarly, a high score for functional status in the scale represents a high/healthy level of functioning. On the contrary, a high score for a symptom item indicates a high level of symptoms/problems.

The EORTC QLQ-CX24 has 24 questions, which are divided into eight sectors. The questionnaire was specifically used to identify the symptoms experienced by women with cervical cancer in relation to their sexuality and sexual activities. Similarly, each section of the EORTC QLQ-CX24 provides a summary score indicating the degree of the problems in the particular section.

Both questionnaires' validity and reliability properties have been evaluated in prior studies (Perwitasari et al., 2011; Hua et al, 2013). Cronbach's  $\alpha$  coefficient of the domains was at 0.7-0.9, with no domain was below 0.7. After both questionnaires were translated into the Indonesian language, it was tested for readability. Also, the instrument was subjected to a pilot test followed by a review from the fellow lecturers to finalize the questionnaire. The questionnaires were given to the participants on papers and were completed by the participants independently. In average, participants took 15 to 30 minutes to complete all questionnaires

### Data analysis

After data collection was completed, all data were analyzed using the Statistical Package for Social Sciences (SPSS) software version 17 (SPSS Inc., USA). Data were then analyzed and presented as descriptive statistics in the form of means and standard deviations.

### RESULTS

The demographic characteristics of the respondents are presented in Table 1. The mean age of women in this study was 48.83 years. Almost half of the respondents (43.9%) completed elementary school as their highest education level, and 80.49% of the respondents were housewives and did not work. Most of the women were married (81.10%), and more than half were diagnosed with stage II or stage III using the FIGO staging classification (Table 1).

*Table 1. Demographic characteristics of the respondents*

Demographic characteristics:	Mean $\pm$ SD	%
Age	48.83 $\pm$ 10.01	
Education Level		
Elementary school		43.90
Junior high school		20.73
Senior high school		27.44
Bachelor		7.93
Work status:		
Working		19.51
Housewife		80.49
Marital status:		
Married		81.10
Widowed		18.90



Demographic characteristics:	Mean ± SD	%
Stage of Disease (FIGO)		
Stage I		13.41
Stage II		46.95
Stage III		34.15
Stage IV		5.49

Table 2 presents the mean score of general well-being and QOL (54.56). This study also showed that the women found their physical and role functions (55.94 and 55.34) were mostly affected by their cancer, followed by emotional functions (54.71), cognitive functions (48.79), and social functions (43.29) interference. The most frequently reported symptoms of sub-group were fatigue (69.93), anorexia (66.72), pain (66.11), financial difficulties (62.04), and sleeplessness (61.59).

*Table 2. Quality of life index and subscale points (n=164)*

	Items	Reference Value*	Mean±SD
Quality of life Subscales Points:			
General well-being & quality of health	29, 30	N/A**	54.56± 5.47
Functional Status:			
Physical functions	1,2,3,4,5	N/A	55.94±19.58
Role functions	6,7	N/A	55.34±25.97
Emotional functions	21,22,23	64.2	54.71±22.27
Cognitive functions	20,25	86.0	48.79±20.18
Social functions	26,27	77.1	43.29±22.38
Symptoms:			
Fatigue	10,12,18	33.8	69.93±21.37
Nausea and vomiting	4,15	8.7	58.81±21.33
Pain	9,19	29.4	66.11±23.91
Difficulty in breathing	8	16.2	40.06±23.33
Sleeplessness	11	36.6	61.59±28.28
Anorexia	13	15.9	66.72±26.59
Constipation	16	20.2	51.51±26.50
Diarrhea	17	7.1	40.21±21.63
Symptoms Economic difficulties	28	9.9	62.04±27.21

\*Reference value was based on EORTC QLQ-C30 Reference Values by the EORTC Groups (2008)

\*\*Not available, reference number was based on the updated questionnaire

The data collected with the QLQ-CX24 showed that sexual worry (52.72) was the most reported problem, followed by menopause symptoms (48.03) as the second and lymphedema (46.89) as the third commonest symptom (See Table 3).

Table 3. EORTC QLQ-CX24 mean points (n=164)

	Items	Mean $\pm$ SD
Symptoms experience	1,2,3,4,5,6,7,9,11,12,13	43.19 $\pm$ 14.43
Body Image	15,16,17	46.41 $\pm$ 21.09
Sexual functions	20,21,22,23	35.31 $\pm$ 20.97
Lymphoedema	8,10	46.89 $\pm$ 19.04
Menopause symptoms	14	48.03 $\pm$ 25.30
Sexual worry	18	52.72 $\pm$ 30.99
Sexual activity	19	33.78 $\pm$ 18.88
Sexual enjoyment	24	31.81 $\pm$ 16.65

## DISCUSSION

Gynecological cancer, namely ovarian, breast, and cervical cancer, dominate cancer incidence in Indonesian women. For cervical cancer, Indonesia ranks second as the country with the highest number of new cervical cancer cases and ranks third for the most death by cervical cancer globally (The Global Cancer Observatory, 2019). The high incidence and mortality rate of cervical cancer in Indonesia ushered increased attention of studies related to the topic; however, many aspects of cervical cancer in Indonesia still need further research. The quality of life of cervical cancer patients is a critical aspect of the illness to study. The purpose of this study was to identify the quality of life of women diagnosed with cervical cancer who have undergone radiotherapy and chemotherapy.

The results of the EORTC QLQ-C30 showed the mean of general well-being and quality of life in this study was on the upper half of the scale (54.56 $\pm$ 25.47). Similarly, a higher value of global health status and quality of life were reflected in some studies in Asia (Akkuzu, 2012; Kumar et al., 2014; Lee et al., 2016). On the other hand, a large percentage of the participants (see Table 2) also reported symptoms, indicating a gap between the perceived quality of life and the reality of symptoms. This gap between the perceived quality of life and the reality of the symptoms experience is likely to be the result of several influences. Firstly, the lack of knowledge and understanding about cancer and its treatment may contribute to the higher value of general well-being and quality of life. Knowledge and understanding directly impact the level of awareness. Other studies reported varying results of the association of the level of awareness with the value of quality of life of cancer patients. Some cancer patients with a strong awareness of disease status and progression showed a positively higher perceived quality of life compared to the patients with low awareness (Lee et al., 2013; Talepasand, Pooragha, & Kazemi, 2013). While another study found higher awareness of disease prognosis in terminally ill cancer patients was associated with a lower value of quality of life (El-Jawahri et al., 2014).

Compared to European countries where cancer studies were extensive, Asian countries have relatively less exposure to the information and understanding of cancer and its treatment. In particular, knowledge and understanding of cancer were not well

established within the general society in Indonesia. Many cancer patients believed completing treatment or finishing their primary treatment regimen meant they were healed, so patients stopped attending health care services. This behavior was also observed in a study to explore the reason for delaying seeking help and non-adherence to treatment in Indonesia. One of the reasons reported was the lack of awareness and knowledge (Iskandarsyah et al., 2014).

A large percentage of the women in this study were at stage II (46.95%), and stage III (34.15%) of cervical cancer and the women perceived a relatively high score of general well-being and quality of health. The study was conducted towards women with cervical cancer at the end of their treatment. The researcher determined the timing of participation of the respondent factored in the higher level of general well-being and quality of health depicted. Previous quality of life studies in cervical cancer patients reported similar findings. Patients with an advanced case of cervical cancer had higher QOL scores after the treatment was undertaken (Dehkordi, Heydarnejad, & Fatehi, 2009; Dahiya et al., 2016). Patients nearing the end of their treatment regimen would have undergone a considerable amount of treatment and perceived better health and a positive experience compared to before they received treatment.

Another factor that is likely to influence the higher score of QOL was a shift in values or beliefs. Sprangers and Schwartz (1999) presented the idea of response shift integration into health-related quality of life, and the concept has been a subject of research in the following years. Serious illnesses such as cervical cancer would likely affect the patient's internal standards, values, and perception and created a change to what is regarded as important in their lives. The change shifted their priorities, values, and beliefs to better their ability to cope with the consequences of the illness and its treatment. The patients would present a more positive attitude towards the illness and perception of their health status.

This study found a gap between the perceived quality of life and the reality of the symptoms experienced, meaning that the QOL mean value might not necessarily reflect the symptoms experienced by the women. The participants of this study reported varying physical problems during the continuum of cancer and care with fatigue, anorexia, sleeplessness, pain, nausea and vomiting, and constipation as the most reported symptoms. The symptoms reported in this study coincides with the findings in several similar studies of quality of life in cervical cancer patients (Clevenger et al., 2013; Endarti et al., 2015). It demonstrated that treatment did not eliminate the physical discomfort of patients and may also exacerbate particular symptoms despite a higher score of the general well-being and quality of health of patients.

Furthermore, compared to the earlier studies, the researcher noted that the mean of the symptoms score reported by participants was significantly higher than the studies with a similarly higher score of general well-being and functional status. A study on the quality of life of women with cervical cancer in Taiwan presented a mean value of 62.69 for Global health status/QOL score and 95.39 for physical functioning, while fatigue and pain symptoms score were 5.95 and 3.99, respectively (Li, Chang, Tsai, & Chen, 2017).

Another study in Indonesia similarly showed a higher score of general well-being/QOL and symptoms subscale scores on the lower end of the range (Dahiya et al., 2016).

In addition to the score of general well-being and quality of health which was in the higher end of score range, several functional statuses were also on the higher end of the score range. Physical and role functions were on the higher end of the score, while cognitive and social functions were on the lower end of the score range. Such distribution of mean was expected to happen as the majority of the quality of life studies with the EORTC QLQ CX-30 instrument had shown a similar trend of distribution. The emotional, cognitive, and social functions score in this study was, however, much lower compared to other studies with social functions as the lowest score (Akkuzu, 2012; Torkzahrani, Rastegari, Khodakarami, Akbarzadeh-baghi-, & Alizadeh, 2013; Dahiya et al., 2016; Lee et al., 2016; Li et al., 2017). Cervical cancer and treatment are a considerable burden on the patients' body. This presented limitations to patients' ability to complete activities they were used before the experience. Such limitation is likely to cause distress in patients and interfere with the way they interact with their surroundings. In Indonesia, where the general society is comparatively more conservative, illness such as cervical cancer has a debilitating impact on the social life of a patient. The stigma surrounding cancer and its patient, as well as the negative cultural beliefs of cancer, prevented patients from resuming their normal social functions (Iskandarsyah et al., 2014).

In the current study, a significant presence of economic difficulties was also observed. Most participants in this study were housewives with no source of income and were entirely dependent on their partners. Presently in Indonesia, the Universal Health Coverage program from the Indonesian government covered the cost of treatment for cancer, thus eliminating a vital part of the economic burden. However, expenses such as transportation, family expenses during the patient's care period, and other miscellaneous expenses must be covered by the patients and their families themselves, amounting to a considerable number. As a reflection, a study in Europe reported of the total cost of cancer in 2009, 40% of the cost was for health care while the remaining was accounted for informal care cost and other costs (Luengo-Fernandez, Leal, Gray, & Sullivan, 2013). Similarly, economic difficulties were reported in previous studies exploring the quality of life of patients with cervical cancer and gynecological cancer in general (Fathollahzade et al., 2015; Ogoncho, Omuga, Wakasiaka, & Muiva, 2015; Pradjatmo et al., 2017; Sharp & Timmons, 2010). The presence of health insurance covering the health care cost of cancer treatment, thus assisted the patient and family to cope with the economic cost of cancer. However, other costs, such as informal care cost and other non-health related cost, was still a considerable financial burden.

This study employed the EORTC QLQ-CX24 to identify the symptoms experienced by women with cervical cancer in relation to their sexuality and sexual activities. The result showed that sexual worry was most prevalent reported by the women, followed by menopause symptoms, lymphedema, and body image.

In patients with gynecological cancer, including cervical cancer, sexuality concerns are a vital aspect of their quality of life. Cervical cancer itself causes sexual-related

concerns in patients, such as concern about their sexual performance, functionality, and activity. The radiotherapy and chemotherapy have been known to cause dyspareunia, decreased lubrication, and dryness, which added to the patient's anxiety about their sexual performance. These accumulated to sexual worry in patients diminishing their confidence to engage in sexual activity. Similar results were observed in other studies (Barnas, Skret-Magierio, Skret, & Bidzinski, 2012; Kumar et al., 2014).

The mean value of lymphedema in this study was among the highest five values aside from sexual worry, menopause symptoms, body image, and symptoms experienced. Other studies noted similar findings where a significant number of the participants reported lymphedema related symptoms (Frøding, Ottosen, Mosgaard, & Jensen, 2015; Lee et al., 2016). In patients with cervical cancer, treatment modalities, including chemotherapy and radiotherapy in the pelvic area, exacerbates the symptoms of lymphedema. Prolonged or recurring lymphedema related symptoms negatively affect the quality of life of women with cervical cancer.

Furthermore, this study found that concerns about body image were among the most prevalent. Body image is a part of the quality of life. A disturbed body image could cause emotional distress in women. The women participating in this study have undergone radiotherapy and chemotherapy. Cervical cancer patients undergoing radiotherapy and chemotherapy commonly experience vaginal changes such as dryness, lack of lubrication, dyspareunia, and sexual dysfunction. These changes could lower women's self-esteem and motivation to engage in sexual activities. In Indonesia, the cultural and social environment of women dictated sexual activities as a duty to their partners, and failure in fulfilling this duty equates a failure as a woman (Afiyanti & Milanti, 2013). It brought looped feedback to the women's sense of her body and further lowered their sexual feelings and sense as a woman (feminine identity). Failure to identify the problem could interfere with the women's role in her family and the social role in the perception shared by the majority of Indonesian.

In the cultural belief of many Indonesian women, women are sexually functional and have fulfilled their duty when they can satisfy their partners, unrelated to any problem they faced to perform this duty (Afiyanti & Milanti, 2013). Sexual problems often remain undetected due to the restriction of such cultural beliefs. Menopausal symptoms were presented to be on the higher end of the score range in this study; however, few women had reported them as indicated in the low value of the sexual function in the EORTC QLQ-CX24 section. Other studies in different countries have compared the sexual function in women with a cancer history and women with no cancer history, and similarly found menopausal symptoms did not reflect in sexual functioning. There was no observed difference between the interaction of menopause problems with sexual functioning in cancer patients and women with no cancer history (Marino et al., 2014; Lee et al., 2016).

The present study findings have some limitations. Despite being a multicenter study, the convenient sampling and relatively small sample size limit the generalizability of the study. Furthermore, on the characteristic respondents, this study did not assess the duration of illness of respondents, which also contributes to respondents' quality of life.

As a result, the researchers were not able to determine a change in QOL of the women through the duration of illness. This study also presented limited evidence about the sexuality of women with cervical cancer as the questionnaire employed in this study mainly focused on the activity and functional aspect of sexuality. Sexuality is a complex concept, and a broader approach in research is needed to explore the concept of cervical cancer patients further. Regardless, this study presented evidence of the impact of cervical cancer, its treatment, and the adverse effects of the treatment on the quality of life of women with cervical cancer. Perceived general well-being and quality of life were not a reflection of the actual symptoms reported. This study recommends providing a more comprehensive assessment to offer a factual description of the women's quality of life and their actual symptoms experience.

## **CONCLUSION**

In conclusion, the quality of life of women with cervical cancer in Indonesia was generally at the higher end of the scale. However, most participants also reported experiencing many symptoms as expressed in the high score on the symptoms scale. Assessing the quality of life of women with cervical cancer is needed by nurses and other health care professionals to develop patient care plans. Currently, cervical cancer treatment still causes considerable discomfort for patients, as reflected in the study results. Thus, formulating a more comprehensive care plan and providing more options for supportive care is necessary to improve the treatment experience of patients undergoing therapy as well as meeting their needs. A culturally sensitive design might benefit more to be implemented in Indonesia with its unique social and cultural beliefs.

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## **CONFLICT OF INTEREST**

The authors declare no conflict of interest in this study.

## **REFERENCES**

- Afiyanti, Y., Martha, E., Wardani, I. Y., & Andrijono, A. (2018). *Development of supportive care to increase the quality of life of the gynecological cancer survivors in Indonesia*. (Unpublished manuscript). Universitas Indonesia, Depok, Indonesia.
- Afiyanti, Y., & Milanti, A. (2013). Physical sexual and intimate relationship concerns among Indonesian *cervical* cancer survivors: A phenomenological study. *Nursing & Health Sciences*, 15(2), 151-156. doi:10.1111/nhs.12006
- Afiyanti, Y., Milanti, A., & Putri, R. H. (2018). Supportive care needs in predicting the quality of life among gynecological cancer patients. *Canadian Oncology Nursing Journal*, 28(1), 1-26.

- Akkuzu, G. (2012). Quality of life of women undergoing chemotherapy for a gynaecological oncological disease in Turkey. *Asian Pacific Journal of Cancer Prevention*, 13(4), 1277-1280. doi:10.7314/APJCP.2012.13.4.1277
- Barnas, E. Skret-Magierio, J., Skret, A., & Bidzinski, M. (2012). The quality of life of women treated for cervical cancer. *European Journal of Oncology Nursing*, 16, 59-63.
- Clevenger, L., Schrepf, A., DeGeest, K., Bender, D., Goodheart, M., Ahmed, A., ... & Mendez, L. (2013). Sleep disturbance, distress, and quality of life in ovarian cancer patients during the first year after diagnosis. *Cancer*, 119(17), 3234-3241. doi:10.1002/cncr.28188
- Dahiya, N., Acharya, A. S., Bachani, D., Sharma, D. N., Gupta, S., Haresh, K. P., & Rath, G. K. (2016). Quality of life of patients with advanced cervical cancer before and after chemoradiotherapy. *Asian Pacific Journal of Cancer Prevention*, 17(7), 3095-3099. doi:10.14456/apjcp.2016.59/APJCP.2016.17.7.3095
- Dehkordi, A., Heydarnejad, M. S., & Fatehi, D. (2009). Quality of life in cancer patients undergoing chemotherapy. *Oman Medical Journal*, 24(3), 204-208. doi:10.5001/omj.2009.40
- El-Jawahri, A., Traeger, L., Park, E. R., Greer, J. A., Pirl, W. F., Lennes, I. T., ... & Temel, J. S. (2014). Associations among prognostic understanding, quality of life, and mood in patients with advanced cancer. *Cancer*, 120(2), 278-285. doi:10.1002/cncr.28369
- Endarti, D., Riewpaiboon, A., Thavorncharoensap, M., Praditsitthikorn, N., Hutubessy, R., & Kristina, S. A. (2015). Evaluation of health-related quality of life among patients with cervical cancer in Indonesia. *Asian Pacific Journal of Cancer Prevention*, 16(8), 3345-3350. doi:10.7314/APJCP.2015.16.8.3345
- Fathollahzade, A., Rahmani, A., Dadashzadeh, A., Gahramanian, A., Esfahani, A., Javanganji, L., & Nabiolahi, L. (2015). Financial distress and its predicting factors among iranian cancer patients. *Asian Pacific Journal of Cancer Prevention*, 16(4), 1621-1625. doi:10.7314/APJCP.2015.16.4.1621
- Frøding, L. P., Ottosen, C., Mosgaard, B. J., & Jensen, P. T. (2015). Quality of life, urogynecological morbidity, and lymphedema after radical vaginal trachelectomy for early-stage cervical cancer. *International Journal of Gynecologic Cancer*, 25(4), 699-706.
- Garssen, B., Vos, P., de Jager Meezenbroek, E., de Klerk, C., & Visser, A. (2011). Analyzing differences between psychotherapy groups and social support groups for breast cancer patients: development of an assessment method using video recordings. *Patient Education and Counseling*, 82(3), 377-383. doi:10.1016/j.pec.2010.11.018
- Hua, C. H., Guo, H. M., Guan, X. L., Kong, F. J., Hou, R. J., Zhang, X. Y., & Li, S. R. (2013). Validation of the European Organization for Research and Treatment of Cancer cervical cancer module for Chinese patients with cervical cancer. *Patient Preference and Adherence*, 7, 1061-1066. doi:10.2147/PPA.S52498
- Huffman, L. B., Hartenbach, E. M., Carter, J., Rash, J. K., & Kushner, D. M. (2016). Maintaining sexual health throughout gynecologic cancer survivorship: A comprehensive review and clinical guide. *Gynecologic oncology*, 140(2), 359-368. doi:10.1016/j.ygyno.2015.11.010

- Iskandarsyah, A, de Klerk, C, Suardi, D.R, Soemitro, M.P, Sadarjoen, S.S, & Passchier, J. (2014). Psychosocial and cultural reasons for delay in seeking help and nonadherence to treatment in Indonesian women with breast cancer: A qualitative study. *Health Psychology, 33*(3), 214-221. doi:10.1037/a0031060
- Kumar, S., Rana, M. L., Verma, K., Singh, N., Sharma, A. K., Maria, A. K., ... & Saini, S. (2014). PrediQt-Cx: post treatment health related quality of life prediction model for cervical cancer patients. *PloS One, 9*(2), e89851. doi:10.1371/journal.pone.0089851
- Lee, M. K., Baek, S. K., Kim, S. Y., Heo, D. S., Yun, Y. H., Park, S. R., & Kim, J. S. (2013). Awareness of incurable cancer status and health-related quality of life among advanced cancer patients: a prospective cohort study. *Palliative Medicine, 27*(2), 144-154. doi:10.1177/0269216311429042
- Lee, Y., Lim, M. C., Kim, S. I., Joo, J., Lee, D. O., & Park, S. Y. (2016). Comparison of quality of life and sexuality between cervical cancer survivors and healthy women. *Cancer Research and Treatment: Official Journal of Korean Cancer Association, 48*(4), 1321-1329.
- Li, C. C., Chang, T. C., Tsai, Y. F., & Chen, L. (2017). Quality of life among survivors of early-stage cervical cancer in Taiwan: an exploration of treatment modality differences. *Quality of Life Research, 26*(10), 2773-2782. doi:10.1007/s11136-017-1619-0
- Luengo-Fernandez, R., Leal, J., Gray, A., & Sullivan, R. (2013). Economic burden of cancer across the European Union: a population-based cost analysis. *The Lancet Oncology, 14*(12), 1165-1174. doi:10.1016/s1470-2045(13)70442-x
- Marino, J. L., Saunders, C. M., Emery, L. I., Green, H., Doherty, D. A., & Hickey, M. (2014). Nature and severity of menopausal symptoms and their impact on quality of life and sexual function in cancer survivors compared with women without a cancer history. *Menopause, 21*(3), 267-274. doi:10.1097/gme.0b013e3182976f46
- Ministry of Health Republic of Indonesia. (2015). Data dan informasi kesehatan situasi penyakit kanker [Data and information on cancer situation]. *Buletin Kanker, 1*(1), 1-5. doi:10.1007/s13398-014-0173-7.2
- Ogoncho, I. M., Omuga, B. O., Wakasiaka, S., & Muiva, M. (2015). Determinants of quality of life among gynaecological cancer patients on follow up at a referral hospital in Kenya. *American Journal of Nursing Science, 4*, 127-130. doi:10.11648/j.ajns.20150403.22
- Perwitasari, D. A., Atthobari, J., Dwiprahasto, I., Hakimi, M., Gelderblom, H., Putter, H., ... & Kaptein, A. A. (2011). Translation and validation of EORTC QLQ-C30 into Indonesian version for cancer patients in Indonesia. *Japanese Journal of Clinical Oncology, 41*(4), 519-529. doi:10.1093/jjco/hyq243
- Pradjatmo, H., Nisman, W. A., & Fatmawati, Y. (2017). Quality of life of cervical cancer patient with support from nuclear family and extended family in Dr. Sardjito general hospital, Yogyakarta Indonesia: A comparative study. *International Journal of Research in Medical Sciences, 5*(8), 3554-3559.
- Sharp, L., & Timmons, A. (2010). *The financial impact of a cancer diagnosis*. Ireland: National Cancer Registry Ireland/Irish Cancer Society.



- Sprangers, M. A., & Schwartz, C. E. (1999). Integrating response shift into health-related quality of life research: A theoretical model. *Social Science & Medicine*, 48(11), 1507-1515. doi:10.1016/s0277-9536(99)00045-3
- Talepasand, S., Pooragha, F., & Kazemi, M. (2013). Resiliency and quality of life in patients with cancer: moderating role of duration of awareness of cancer. *Iranian journal of cancer prevention*, 6(4), 222-226.
- The Global Cancer Observatory. (2019). *Indonesia*. Retrieved from <https://gco.iarc.fr/today/data/factsheets/populations/360-indonesia-fact-heets.pdf>
- Torkzahrani, S., Rastegari, L., Khodakarami, N., Akbarzadeh-Baghian, A., & Alizadeh, K. (2013). Quality of life and its related factors among Iranian cervical cancer survivors. *Iranian Red Crescent Medical Journal*, 15(4), 320-323. DOI: 10.5812.ircmj.4410
- Vistad, I., Fossa, S.D., & Dahl, A.A., G. O. (2006). A critical review of patient-rated quality of life studies of long-term survivors of cervical cancer. *Gynecologic Oncology*, 102, 563-572.
- Wenzel, L., Vergote, I., & Cella, D. (2003). Quality of life in patients receiving treatment for gynecologic malignancies: Special considerations for patient care. *International Journal of Gynecology & Obstetrics*, 83, 211-229. doi:10.1016/S0020-7292(03)90123-8

## **Increasing Knowledge, Attitudes, Skills, and Glucose Control in Type-2 Diabetic Patients through EMAS Interventions**

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### **ABSTRACT**

**Background:** Diabetes Mellitus (DM) is a chronic and non-communicable disease that has serious impacts. Previous studies have focused on a single intervention in the management of DM. Therefore, EMAS (education, nutrition management, physical activities, and stress management) interventions are proposed to convey the pillars of diabetes mellitus as endorsed by the Indonesian Ministry of Health.

**Purpose:** This study aimed to analyze the effects of EMAS interventions on the knowledge, attitudes, skills, and glucose control in patients with type-2 DM.

**Methods:** This study used a pretest-posttest quasi-experimental design without control groups. The samples were 86 diabetic patients recruited using a purposive sampling technique. The EMAS interventions were conducted for six months and eight sessions (October 2018 to March 2019). The EuroQoLfive-dimensional (EQ-5D) questionnaire was used to collect the data, and the paired t-test was used for data analysis.

**Results:** The results showed that there were significant differences in the knowledge, attitudes, skills ( $p=0.001$ ), and glucose control ( $p=0.04$ ) of type 2 diabetes mellitus after the implementation of EMAS interventions.

**Conclusion:** EMAS interventions significantly increased the knowledge, attitudes, and skills in patients with type 2 diabetes to behave healthier to control their blood sugar. Community nurses can use EMAS intervention for the management of DM among diabetic patients.

**Keywords:** Knowledge; attitudes; skills; glucose control; type-2 diabetes mellitus

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### **BACKGROUND**

International Diabetes Federation (IDF) shows that there are 415 million people in the world in 2015 who are diagnosed having diabetes mellitus (DM), and the organisation predicts that in 2040, the disease will increase to 642 million (Ministry of Health Republic of Indonesia, 2016). In addition, World Health Organization (WHO) stated

that in 2004 there were around 194 million people experience diabetes and the organisation forecasted that the total number would reach 333 million people in 2025, with the largest populations are in Asia and Oceania (Ayele, Tesfa, Abebe, Tilahun, & Girma, 2012; Mohebi, Parham, Mozafarion-Pour, & Kamran, 2014). Adult people who have diabetes in Southeast Asia in 2015 are 8.5% (Jeong & Yu, 2018). Meanwhile, Indonesia contributes a substantial prevalence related to the increase in persons with diabetes from 2007 to 2018. The Basic Health Research (Riskesdas)'s data showed that the total number of people living with diabetes was 5.7% in 2007, and 8.5% in 2018 (Ministry of Health Republic of Indonesia, 2018). Therefore, the phenomenon requires management programs for glucose control.

Diabetes mellitus can be controlled by self-management behaviours, such as providing health education, having nutrition management (meal planning or diet), doing regular physical activities to reduce the overweight, taking pharmacological interventions that regularly take medication/insulin, monitoring blood sugar levels routinely, doing foot care, and taking stress management (Joiner, Nam, & Whittemore, 2017; Wattanakul, 2012). Besides, maintaining blood glucose levels within normal limits is very important in the management of diabetes mellitus. Diet is an effective way which has a significant impact to stabilise the blood glucose levels (Al-Khalifa, Mathew, Al-Zaid, Mathew, & Dashti, 2009).

The latest findings of a study that is based on social-cognitive theories find that physical activities in women who have diabetes mellitus are useful to increase self-efficacy (Ahdizadeh, Peymam, Taghipour, Esmaily, & Mahdizade, 2013). A study which was conducted on the factors that influence self-management of adults who experienced type 2 diabetes, in Malang City, East Java, shows that a factor which can improve self-efficacy and self-awareness of people living with diabetes is to achieve good self-management behaviours, such as having a healthy diet, exercising regularly, monitoring the blood sugar levels actively, taking medication regularly, and doing foot care (Dwi, Amatayakul, & Karuncharernpanit, 2017). Fan, Cde, and Sidani (2018) point out that Diabetes Self-Management Education (DSME) plays a vital role in empowering people with diabetes to engage and maintain the lifestyle changes, which have been proven able to improve the health quality. DSME is a process of facilitating knowledge, attitudes, and abilities needed for self-management.

Darling-Fisher, Kanjirath, Peters, and Borgnakke (2015) state that nursing interventions have focused on the pillars of managing diabetes mellitus. It means that innovation is needed for service providers specifically to educate diabetic patients about the need for appropriate preventive care through a community-based approach. Health promotion activities in many studies have been stated as determinants of a person's behaviour, so health promotion will be an essential factor in promoting healthy behaviour (Lari, Tahmasebi, & Noroozi, 2017; Wang, Ou, Tsai, Chang, & Kao, 2016). Services that are provided in a comprehensive and quality manner require development to be able to describe health promotion to support adults with diabetes mellitus in behaving (Liang et al., 2011).

Several efforts should emphasize the overall management that is covered in the form of *EMAS* (education, nutrition management, physical activities, and stress management) interventions to change patient behavior in glucose control. It is a combination of the pillar of diabetes management, such as education, nutrition management, physical activity, and stress management to improve type 2 diabetes patients' behaviour to control blood glucose. Many previous studies have investigated a single intervention for diabetes management. However, limited studies have been focused on multi interventions to manage diabetes. Therefore, a study involving multi interventions which convey the pillars of diabetes management, such as *EMAS* interventions is highly needed.

### **PURPOSE**

This research aims to analyse the effects of *EMAS* (education, nutrition management, physical activities, and stress management) nursing interventions on the knowledge, attitudes, skills, and glucose control among patients with type-2 diabetes mellitus.

### **METHODS**

#### **Research design**

This study used a quasi-experiment pre-post test without control group design for six months, from October 2018 to March 2019).

#### **Samples and setting**

This research was conducted in a village in Cimanggis District, Depok City. The study used a purposive sampling technique which obtained 86 respondents according to the criteria and the objectives of the study (Polit & Beck, 2010). The inclusion criteria were patients with a medical diagnosis of type 2 DM, aged 35-59 years old, and being able to read and write. The exclusion criteria were patients with foot complications, diabetic, and bed rest.

#### **Research instrument and data collection**

According to the assessment of the psychometric properties of the Health-Related Quality of Life Instruments (HRQoL), this research used the EuroQoL five-dimensional (EQ-5D) scale instrument. EQ-5D was scored using assessments derived from the UK general population survey with the domains contained in the patient's self-care and what activities are normally done. The brief diabetic knowledge test in questionnaire format developed by the University of Michigan Diabetes Research and Training Center and the attitude toward self-care questionnaire based on the diabetic care profile were used.

The *EMAS* interventions were carried out in 8 sessions where each session was around 30 minutes long. The data collection processes were as follows; 1) selecting research subjects that were adjusted to the inclusion criteria; 2) providing research information clearly to the research subjects; 3) requesting the respondent's approval to be the subject of research by providing an informed consent sheet; 4) determining the groups of research subjects which were divided into seven groups; 5) completing pre-test questionnaire to all respondents; and 6) measuring post-test after *EMAS* interventions were finished. The intervention activities are presented in Table 1.

*Table 1. Schedule of EMAS (education, nutrition management, physical activity, stress management) interventions*

Session	Activities	Method
Session 1	Diabetes education	Watching educational videos, discussions, and evaluation of workbooks which was held once in the first week of November.
Session 2	Health screening: risk factors screening for diabetes mellitus	The support group method by health cadres to the community, demonstration, and re-demonstration on the google form filling training for health cadres which were held twice in November.
Session 3	Nutritional management: healthy and unhealthy food for diabetes patients	The brief quiz method and evaluation of workbooks which were held twice in the third and fourth weeks of November.
Session 4	Nutritional management: calculating the body's calorie	A tutorial that was held once in the first week of December.
Session 5	Nutritional management: compiling a daily meal menu	Demonstrations and re-demonstrations that were held once in the second week of December, as well as evaluating workbooks, in the third week of January.
Session 6	Increased exercise: Diabetic foot exercises	Demonstration and re-demonstration methods carried out for five meetings in the first, second, and third weeks of February, and the first and second weeks of March.
Session 7	Increased exercise: Gymnastics	Conducted with health cadres and the community every week.
Session 8	Progressive muscle relaxation and music therapy	Community nurse specialists conducting the program for five meetings in the third week of February until the third week of March.

**Data analysis**

Statistical tests for all analyses had a significance level of 95% (alpha 0.05). A paired t-test was used to test the differences between the two dependent variables.

**Ethical consideration**

The study was approved by the research ethics committee from the Faculty of Nursing, University of Indonesia, number 62/UN2.F12.D/HKP.02.04/2018.

**RESULTS**

The characteristics of respondents in this study included gender, education, sources of information about DM, income, and the age. Table 1 shows that the majority of the respondents were women, graduated from junior high school, not getting information from anyone, and having income under the minimum wage. The mean age was 45.70 years.

Table 2. The characteristics of respondents (n=86)

Characteristics of respondents	Intervention (n=86)	
	f	%
<b>Age</b> (Mean±SD)	45.70±6.928	
<b>Gender</b>		
Man	34	39.5
Woman	52	60.5
<b>Education</b>		
No school	8	9.3
Not graduated from primary school	15	17.4
Graduated from elementary school	19	22.1
Graduated from junior high school	24	27.9
Graduated from high school	18	20.9
College	2	2.4
<b>Sources of information about DM</b>		
Health workers	18	20.9
Family/friends	23	26.7
Media (TV/newspapers, internet, posters)	21	24.5
Not getting information from anyone	24	27.9
<b>Income</b>		
< Rp 3.565.660	62	72.1
≥ Rp 3.565.660	24	27.9

Table 3 shows that the mean of knowledge and attitudes increased from 56.05 to 76.98 and from 22.14 to 33.36, respectively, after the intervention. Similarly, the mean of skills increased from 5.51 to 7.13, while the mean of blood glucose decreased from 238.36mg/dl to 231.63mg/dl after the intervention. There were significant differences in knowledge, attitudes, skills ( $p=0.001$ ), and glucose control ( $p=0.04$ ) of type-2 diabetes after the interventions.

Table 3. Knowledge, attitude, skill, and glucose type 2 diabetic patients (n=86) before and after the interventions

Variable	Mean	SD	95% CI	p-value
<b>Knowledge</b>				
Before	56.05	16.61		
After	76.98	11.59	(-8.015) – (-7.148)	0.001
<b>Attitudes</b>				
Before	22.14	4.46		
After	33.36	2.63	(-12.360) – (-10.081)	0.001
<b>Skills</b>				
Before	38.59	1.70		
After	49.88	0.94	(-13.428) – (-9.154)	0.001
<b>Glucose</b>				
Before	238.36	79.48		
After	231.63	65.79	(0.196) – (13.270)	0.04

## DISCUSSION

The results of this study showed that EMAS had a significant effect on knowledge, attitudes, skills, and glucose control of type 2 diabetic patients. Knowledge, attitudes, and skills of a person would increase if he or she was carried out mentoring to give an activity or a way to stimulate themselves in the form of activities that trigger to raise their awareness. As an example, in this case, EMAS intervention was given to adults with diabetes mellitus specifically to increase self-awareness and then create good self-management for their care. Therefore, it is indeed necessary to have a nursing intervention in the health care system given to adults of type 2 diabetes mellitus with efforts to promote and prevent disease control. There are several reasons why the EMAS intervention could increase KSB and control glucose level.

The EMAS intervention provides education to promote healthy living that needs to be done as a part of efforts to prevent and control diabetes mellitus. The International Diabetes Association believes that to prevent the complications of diabetes or disease from being more sustainable, the need for health education for the behaviour of self-management of people with diabetes should be promoted (Lari et al., 2017). Health-related research found that Diabetes Self-Management Education (DSME) plays a crucial role in empowering people with diabetes to engage and maintain lifestyle changes, which have been shown to improve health outcomes. DSME is a process of facilitating the knowledge, skills, and abilities needed for self-management. DSME needs to be done on people with diabetes regularly, which is also in line with the Ministry of Health program (Fan, Cde, & Sidani, 2018).

In addition to the health education provided in EMAS interventions, the interventions also combine nutrition management, which included diet, recommended, restricted, and avoided foods, calculating the body's caloric needs, and compiling a meal menu each day. The principle of eating regulation for people living with diabetes is almost the same as the recommended diet for the general public, namely food that is balanced by the calorie and nutritional needs of each individual. Adults' diabetes mellitus needs to be emphasized on the importance of regular eating schedules, type, and amount of calorie contents, especially in those who use drugs that increase insulin or insulin therapy itself (Zamani-alavijeh, Araban, Mohammadi, & Goodarzi, 2017). This nutrition management intervention also has the same results as research related to nutritional counseling for people with type 2 diabetes and has been shown to increase respondents' knowledge and skills in measuring balanced nutrition (Herring, Beckett, Stanton-robinson, & Witry, 2018).

Physical activities were also included in the intervention after giving nutrition management for five meetings. Physical activities reported by the World Health Organization are carried out regularly 3-5 times a week for at least 30 minutes, with a total of 150 minutes per week, and a training break of no more than two consecutive days. When doing exercise, it is recommended to examine the glucose level before the exercise begins (Alghafri et al., 2017). If the blood glucose level is <100mg/dL, the patients must consume carbohydrates first, and if it is >250mg/dL, the patients should delay the physical exercises.

Lastly, stress management was also emphasized in the interventions. Increased risk of diabetes mellitus under stress conditions is caused by excessive production of the cortisol hormone. Excessive production of the cortisol hormone will affect to sleeplessness, depression, blood pressure increase, which will then make a person become weak and have excessive appetite. Therefore, a method to reduce the stress that occurs is needed (Awadalla et al., 2017). Stress management is effective in reducing stress levels and controlling blood sugar in diabetes mellitus by training progressive muscle relaxation and music therapy. Progressive muscle relaxation has various benefits. It can be seen from the results of previous studies related to the effects of progressive muscle relaxation with music and aromatherapy to reduce the level of stress among teachers (Dewi, Margawati, & Mu'in, 2019). The same study about the effect of progressive muscle relaxation therapy also found that the therapy is very effective in reducing stress and blood sugar with a significant value of 0.003 (Guo et al., 2017).

The effect of EMAS innovation was also caused by various types of media and methods. The learning module is beneficial to be used as a tool for residency students to provide EMAS interventions to adult's diabetes mellitus and later can also be used by health workers in providing health education. Meanwhile, workbooks were given to adult's diabetes mellitus as a material for training when the intervention takes place. Modules and workbooks were written with the aim that health workers could provide appropriate interventions, and adults with diabetes mellitus could learn independently after getting direction from the cadres. This phenomenon in line with the previous research that by utilizing media tools in the form of module development for health workers, the results show that there is a positive reaction to the development of the module, and the post-training test results in the form of knowledge, attitudes, monitoring, and evaluation are higher than initial testability (Khaikleng, Wongwanich, Sriklaub, & Ajpru, 2015). Family support is also necessary to realise, based on the results of research that the family empowerment affected family support in patients with type-2 DM (Luthfa & Ardian, 2019).

The present study, however, still had limitations that it did not involve a control group, so there was no comparison group from the results of this study. Further research may employ a larger number of participants with a control group and a longer period of interventions. Nonetheless, this study has contributed to provide evidence for the nursing management of diabetes mellitus especially in the community.

## **CONCLUSION**

The result showed that knowledge, attitudes, skills, and glucose control adults with type 2 diabetes mellitus increased after the implementation of EMAS (education, nutrition management, physical activity, and stress management) interventions. Thus, providing interventions should be adjusted to the management of the disease and the needs of the patients. Programs related to the promotive and preventive efforts need to be reviewed by paying more attention to the distinctive aspects of diabetes mellitus patients and the region as a pilot. The health office also needs to integrate health education provided to diabetes mellitus patients using a comprehensive method in accordance with DM management, and utilize a variety of media that are more interactive and applicable, both for health workers themselves and adults with diabetes mellitus who focuses on



improving knowledge, attitudes, skills, and blood sugar controlling. Public health nursing services need to be established in order to increase the health services to be more precisely determine what interventions are following community problems.

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#### **CONFLICT OF INTEREST**

The authors declare no conflict of interest in this study.

#### **REFERENCES**

- Ahdizadeh, M., Peymam, N., Taghipour, A., Esmaily, H., & Mahdizade, S. (2013). Effect of health education program on promoting physical activity among diabetic women in Mashhad, Iran: applying social cognitive theory. *Journal of Research in Health Sciences*, 13(1), 90-7.
- Al-Khalifa, A., Mathew, T. C., Al-Zaid, N. S., Mathew, E., & Dashti, H. M. (2009). Therapeutic role of low-carbohydrate ketogenic diet in diabetes. *Nutrition*, 25(11–12), 1177–1185. doi:10.1016/j.nut.2009.04.004
- Alghafri, T. S., Alharthi, S. M., Al-balushi, S., Al-Farsi, Y., Al-busaidi, Z., Bannerman, E., ... Anderson, A. S. (2017). Health professionals' perceptions about physical activity promotion in diabetes care within primary health care settings in Oman. *Heliyon*, 3(12), e00495. doi:10.1016/j.heliyon.2017.e00495
- Awadalla, H., Noor, S. K., Elmadhoun, W. M., Almobarak, A. O., Elmak, N. E., Abdelaziz, S. I., ... Ahmed, M. H. (2017). Diabetes complications in Sudanese individuals with type 2 diabetes: Overlooked problems in sub-Saharan Africa? *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 11(suppl 2), S1047–S1051. doi:10.1016/j.dsx.2017.07.039
- Ayele, K., Tesfa, B., Abebe, L., Tilahun, T., & Girma, E. (2012). Self care behavior among patients with diabetes in Harari, Eastern Ethiopia: the health belief model perspective. *PLoS One*, 7(4), e35515. doi:10.1371/journal.pone.0035515
- Darling-Fisher, C. S., Kanjirath, P. P., Peters, M. C., & Borgnakke, W. S. (2015). Oral health: An untapped resource in managing glycemic control in diabetes and promoting overall health. *Journal for Nurse Practitioners*, 11(9), 889-896. doi:10.1016/j.nurpra.2015.08.001
- Dewi, C. F., Margawati, A., & Mu'in, M. (2019). Effects of progressive muscle relaxation intervention with music and aromatherapy on decreasing stress level among teachers. *Nurse Media Journal of Nursing*, 8(2), 71-78. doi:10.14710/nmjn.v8i2.20681
- Dwi, A., Amatayakul, A., & Karuncharernpanit, S. (2017). Predictors of diabetes self-management among type 2 diabetics in Indonesia: Application theory of the health promotion model. *International Journal of Nursing Sciences*, 4(3), 260-265. doi:10.1016/j.ijnss.2017.06.010
- Fan, L., Cde, R. N., & Sidani, S. (2018). Factors influencing preferences of adult with type 2 diabetes for diabetes self-management education interventions. *Canadian Journal of Diabetes*, 42(6), 645-651. doi:10.1016/j.jcjd.2018.04.003
- Guo, W., Zhu, H., Wang, Z., Chen, J. A., Wu, J., Zhu, Y., & Gu, X. (2017). Novel rhyinchophylline analogues as microvascular relaxation agents for the treatment of

- microvascular dysfunction caused by diabetes. *European Journal of Medicinal Chemistry*, 139, 657-664. doi:10.1016/j.ejmech.2017.08.026
- Herring, M. S., Beckett, E. A., Stanton-robinson, C. A., & Witry, M. J. (2018). What do I eat? Impact of an interactive teaching method for improving pharmacy students' diabetes nutrition knowledge and comfort in providing nutrition counseling. *Currents in Pharmacy Teaching and Learning*, 10(7), 918-24. doi:10.1016/j.cptl.2018.04.015
- Jeong, J., & Yu, J. (2018). Prevalence and influencing factors of metabolic syndrome among persons with physical disabilities. *Asian Nursing Research*, 12(1), 50-55. doi:10.1016/j.anr.2018.02.001
- Joiner, K. L., Nam, S., & Whittemore, R. (2017). Lifestyle interventions based on the diabetes prevention program delivered via eHealth: A systematic review and meta-analysis. *Preventive Medicine*, 100, 194-207. doi:10.1016/j.ypmed.2017.04.033
- Khaikleng, P., Wongwanich, S., Sriklau, K., & Ajpru, H. (2015). A training module for evaluation capacity building of a health support organisation in Thailand. *Procedia Social and Behavioral Sciences*, 171, 1395-1399. doi:10.1016/j.sbspro.2015.01.259
- Lari, H., Tahmasebi, R., & Noroozi, A. (2017). Diabetes & metabolic syndrome: Clinical research & reviews effect of electronic education based on health promotion model on physical activity in diabetic patients. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 12(1), 45-50. doi:10.1016/j.dsx.2017.08.013
- Liang, X., Wang, Q., Yang, X., Chao, J., Chen, J., Mo, X., ... Gu, D. (2011). Effect of mobile phone intervention for diabetes on glycaemic control: a meta-analysis. *Diabetic Medicine*, 28(4), 455-63. doi:10.1111/j.1464-5491.2010.03180.x
- Luthfa, I., & Ardian, I. (2019). Effects of family empowerment on increasing family support in patients with type-2 diabetes mellitus. *Nurse Media Journal of Nursing*, 9(1), 58-68. doi:10.14710/nmjn.v9i1.22501
- Mohebi, S., Parham, M., Mozafarion-Pour, E., & Kamran, A. (2014). Self-care assessment in patients with diabetes in Qom city in 2013. *Archives of Hygiene Sciences*, 3(4), 167-176.
- Polit, D. F., & Beck, C. T. (2010). *Essentials of nursing research appraising evidence for nursing practice* (Seventh Ed). China: Library of Congress Cataloging in Publication Data.
- Ministry of Health Republic of Indonesia. (2016). *Info datin: Waspada diabetes [Datin information: Beware of diabetes]*. Retrieved November 12, 2018, from <https://pusdatin.kemkes.go.id/folder/view/01/structure-publikasi-pusdatin-info-datin.html>
- Ministry of Health Republic of Indonesia. (2018). *Riset kesehatan dasar tahun 2018-kementerian kesehatan [Basic health research 2018-ministry of health]*. Retrieved from [https://www.depkes.go.id/resources/download/info-terkini/materi\\_rakorpop\\_2018/Hasil%20Riskasdas%202018.pdf](https://www.depkes.go.id/resources/download/info-terkini/materi_rakorpop_2018/Hasil%20Riskasdas%202018.pdf)
- Wang, L.W., Ou, S.H., Tsai, C.S., Chang, Y.C., & Kao, C.W. (2016). Multimedia exercise training program improves distance walked, heart rate recovery, and self-efficacy in cardiac surgery patients. *The Journal of Cardiovascular Nursing*, 31(4), 343-349. doi:10.1097/JCN.0000000000000246

- Wattanakul, B. (2012). *Factors influencing diabetes self management behaviors among patients with T2DM in rural Thailand* (Unpublished Doctoral Dissertation). University of Illinois Chicago, Chicago, United States.
- Zamani-alavijeh, F., Araban, M., Mohammadi, V., & Goodarzi, F. (2017). Development and psychometric evaluation of a new instrument to assess nutritional perceptions and behaviors of diabetic men. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 119(Suppl 2), S949-S955. doi:10.1016/j.dsx.2017.07.021

## **Development and Trial of a Paediatric Falls Screening Tool for Use in an Indonesian Context**

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### **ABSTRACT**

**Background:** Falls in the hospital have become an important issue internationally with numerous studies and assessment tools developed with a focus mainly on elderly adults. However, little has been written about falls in children in the hospital, which reveals evidence that falls and the sequels are significant problems.

**Purpose:** This study aimed to develop a culturally-based instrument for paediatric falls prevention.

**Methods:** In this action research study, participants, in this case, clinical nurses, joined the researcher in progressive problem-solving in two phases, starting with composing tool items based on the previous tools and research, then conducting validity and reliability tests. The instrument, the Paediatric Risk of Falls (PROF) Scale, was developed based on a literature review, contemporary models and the local context, and its content validity. In phase two, the staff of one local hospital participated in an education programme in the use of the tool, then were involved in the screening of all falls within two months on 156 paediatric patients in the paediatric ward in a local hospital in Indonesia. Data were analysed to examine the validity and reliability of the PROF Scale using Pearson Product Moment and Cronbach's alpha coefficients.

**Results:** Two of nine items related to medication and surgery were judged as not valid, possibly because of study parameters and technical problems in completing the items. One item on parental involvement, which was developed based on cultural practice in Central Java, was judged as a valid item. All items demonstrated acceptable reliability statistics.

**Conclusion:** The PROF Scale demonstrates satisfactory validity and reliability as a scale for assessing falls in pediatric settings in an Indonesian context, but needs to be tested in other settings to further test validity and reliability as well as its application and acceptability.

**Keywords:** Culture; Indonesia; pediatric falls; prevention; safety

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## **BACKGROUND**

Safety is noted as a basic human need in the theories of Maslow (Dewit & O'Neill, 2014; Maslow, 1943) and Henderson (Mason, Isaac, & Colby, 2011). These theories are complemented by regulatory bodies' requirements for practice, such as the International Council of Nurses Code of Ethics, which states that "The nurse's primary professional responsibility is to people requiring nursing care." ( International Council of Nurses [ICN], 2012). World Health Organization [WHO] (2013) defined patient safety as the prevention of errors and adverse effects to patients associated with health care. Both the Joint Commission International and Minister of Health Regulation set the prevention of falls as the sixth goal of patient safety (Joint Commission International [CJI], 2012; Ministry of Health Republic of Indonesia [MoHRI], 2011).

Patients who fall off beds can experience a worsening of their condition, or worse further injury (WHO, 2013) therefore improving human resources and facilities plays an important role in patient safety (Black, Car, Pagliari, Anandan, Cresswell, Bokun, & Sheikh, 2011; Tzeng, 2011).

Problems such as old furniture, rails, and wheels of beds that do not work yet are still used for patients, need to be addressed systematically. Nurses must take responsibility for the prevention of falls, and families can be educated to decrease risk by being with their child in the hospital; however, in the absence of a systematic fall screening tool and implementation of a model, the unwanted incidence of falls remains.

While safety has become a significant economic and health issue in developed countries, and prevention of falls a major drive, this has yet to become a prominent issue locally where there is a lack of hospital models or programs to reduce falls such as those developed in overseas countries (Choi, Lawler, Boenecke, Ponatoski, & Zimring, 2011; Miake-Lye, Hempel, Ganz, & Shekelle, 2013; Raeder, Siegmund, Grittner, Dassen, & Heinze, 2010; Razmus & Davis, 2012; Tzeng, 2011). There is disagreement in the literature which models are most beneficial, and there is a clear need to review the overseas work and synthesise the findings into a tool and a model which is suitable for the Indonesian context. In the absence of any publications or known applications related to the Indonesia situation, this study is most timely.

## **PURPOSE**

This study aimed to develop and test a pediatric falls scale and test it in an Indonesian cultural context, specifically in Central Java, to reduce falls-related injuries in hospitalized children.

## **METHODS**

This study was approved and a Permit was granted by the Department of Infection Control and Prevention of the Local Public Hospital. The data collection was conducted with strict adherence to principles of confidentiality - all patient information was de-identified. Head nurses were invited from the Emergency Room, Outpatient Unit, PICU, and the Paediatric ward to be trained in the use of the PROF Scale, which was developed for the study.

The initial meeting consisted of brainstorming the possible factors and issues that would be included in the study such as the development of the tool to be used within the study: age, gender, length of stay (LOS), medical condition, intravenous, surgery, medication, parental/guardian involvement, and environmental factors.

The project was comprised of two phases: 1). Composing items for the tool based on the existing validated tools, and 2) Conducting validity and reliability test for the tool. In phase one, the tool to be used was developed by reviewing other protocols used for child safety in acute care settings as well as gathering information from the nurses and medical staff working at Salatiga Local Public Hospital where the pilot study was to take place. Pediatricians and paediatric nurses from other hospitals and academics from other institutions of higher education provided the content validity for developing the tool. The final product being the Paediatric Risk of Falls Scale (PROF Scale) with nine items.

The PROF Scale was checked against existing tools such as the Royal Darwin Falls and Prevention Protocol, Falls Prevention Policy at Westmead Children's Hospital in New South Wales, the Humpty Dumpty Fall Assessment Tool as well as established tools, the GRAF-PIP, Humpty Dumpty, CHAMPS, and PFRA. It was discovered parts of these tools were relevant and appropriate for local use, however other sections and items were not relevant to our study as they tended to reflect issues existing in developed countries rather than those of a developing country. In higher and middle-income countries, it is common for parents to leave their hospitalized children alone in the hospital. Roberts (2010) revealed that one-third of hospitalized children were not accompanied by their parents for at least part of the hospitalisation. A qualitative follow-up study was conducted, and it was discovered that financial issues and not being able to leave work were the main reasons for not being with the child in the hospital (Roberts, 2012). These findings contrast with typical Indonesian hospitals where a guardian must stay with the hospitalized child. This might be the child's parents, grandmother, or caregiver.

Hospital facilities also differ remarkably between developed and developing countries. In rural hospitals in some developing countries, it is often observed that wheel(s) or rail(s) of hospital beds do not function. In some cases, patients share beds and even have makeshift mattresses or couches as beds in corridors. Patient and occupational health and safety policies in developed countries are strong and adhered to, and facilities must be in good condition. Therefore, the PROF Scale added items related to guardian presence, and wheels and rails of bed condition as an item/subitem. Once developed, the tool was translated into Indonesian.

In phase two, head nurses from the Emergency Room, the Outpatient Unit, the Paediatric Ward, and PICU were trained to use the PROF Scale. They were asked to teach nurses in their own unit how to use the scale. The PROF Scale tool was piloted by being placed in the front of children's medical records on arrival at the Emergency Room (ER), the Outpatient Paediatric Unit, and in the ward. The Emergency Room nurses had difficulties with this as there were too many admissions and not enough staff, so very few admissions came from the ER with paperwork completed or armbands on. The Outpatient Clinic also proved to be difficult until research assistants were placed there for two hours in the morning. On the ward, paperwork was often filled out retrospectively as the nurses did not see this as a priority. Reasons used by the nurses were; too many patients to care for or the patient was deteriorating. Once again, the use of a research assistant was needed.

The sample was comprised of 156 paediatric patients who were chosen using purposive technique sampling, all with parents/guardians involvement, as it is typical of Indonesian hospitals to have them present with their children.

## RESULTS

The PROF Scale consists of 9 items. The items are age, gender, current LOS, medical condition, intravenous, surgery, medication, parental/guardian involvement, and related environmental factors. There is also a section on the scale which consists of several open-ended questions about details of IV location, other medications received by the patient, bed condition, room features, falls events, and nurse-patient ratio. Patients were assessed twice a day at 10 a.m. and 10 p.m. as at those times, the routine activities had been done, and the nurses would have sufficient time to examine the child's condition and complete the scale. The attending nurses were also requested to complete the open-ended questions. After several-day's trial, the number of scales completed was low; therefore, research assistants were recruited to conduct the assessments and complete the scale while the nurses were able to perform their care usual related tasks.

After a one-month trial, there were 156 patients on whom the PROF Scale was administered. The patient's age ranged from infancy to adolescence years old, male and female, with acute diseases, such as typhoid fever, acute respiratory disease, diarrhea, dengue fever, post-surgery. The face and content validity were addressed based on the literature review and the pilot study with experts, while the reliability of the scale was tested using the Pearson Product Moment coefficient. Five items were found to be acceptable, while two were problematic (Table 1). All items proved reliable, and the overall scale reliability was acceptable (Table 2).

*Table 1. Item to item total correlations of PROF scale*

No.	Indicators	r Score to r Total	r Table $\rightarrow$ $\alpha=0.05$	Probability	Interpretation
1	Current Los	0.308	0.148	0.000	Valid
2	Medical Condition	0.463	0.148	0.000	Valid
3	Intravenous	0.274	0.148	0.000	Valid
4	Surgery	0.033	0.148	0.669	Invalid

No.	Indicators	r Score to r Total	r Table $\rightarrow$ $\alpha=0.05$	Probability	Interpretation
5	Medication	0.023	0.148	0.768	Invalid
6	Parental/guardian Involvement	0.185	0.148	0.017	Valid
7	Environmental Factor	0.964	0.148	0.000	Valid

Table 2. The reliability of PROF scale

Reliability Statistics	
Cronbach's Alpha	N of Items
.882	9

## DISCUSSION

The study set out to develop a pediatric falls scale, based on those developed and with proven reliability and validity in overseas studies, for use in a local Indonesian hospital. Several protocols and tools were examined, and after discussion and comments from local experts, in Phase one, the nine-item PROF Scale was developed.

The PROF Scale was developed based on previous established paediatric falls measurements, namely GRAF-PIP, Humpty Dumpty, CHAMPS, and PFRA. Ryan-wenger, Kimchi-woods, & Erbaugh (2012) study indicated that the accuracy of these tools was insufficient as their items were based on adult falls tools. Furthermore, the study also showed that the toddlers and male patients who were having musculoskeletal problems; in fact, did not experience falls. An integrative study by DiGerolamo and Davis (2017) uncovered similar findings – that there was a lack of fall screening tools that were valid and reliable across institutions and diverse populations. However, a recent literature review (Chromá, 2016) argued that the Humpty Dumpty measuring scale was the most suitable tool to measure the risk of falls for hospitalized children.

Accordingly, Jamerson et al. (2014) described that most of the falls of hospitalized children were, in fact, occurred when the floor was clean and dry while the parents were present, also when the light was good. In addition, the study also revealed that most of the incidents occurred during the time the children were trying to grab an object. However, another study which implemented the Humpty Dumpty Falls Scale in paediatric specialty care showed that the scale had low accuracy in measuring falls risk among children in specialty care. Consequently, the study recommends identifying in more detail the characteristics of all paediatric patients who had experienced falls in all hospitals ( Ryan-wenger, Kimchi-woods, & Erbaugh, 2012), as well as in specialty paediatric hospitals (Pauley & Houston, 2014).

The pilot testing revealed difficulties with the tool being accepted by the hospital nurses, and completing the tool in a timely and complete manner proved difficult. Therefore, research assistants were employed to help with the administration and correct completion of the scale.



There were two items on PROF Scale, 'surgery' and 'medication', which were shown to be problematic. It is likely this was caused by the sampling imbalance (Polit & Beck, 2012) in this study, where there were only 5 out of 156 paediatric patients who underwent surgery, and only 18 of 156 paediatric patients had received particular medications which were listed on the scale.

In accordance with Indonesian culture, the item identifying parental presence was important, and the PROF Scale provides an additional choice for guardian involvement in the item, as some paediatric patients were not always accompanied by their parents. Although valid and reliable in this study, Jamerson et al. (2014) found that the falls occurred when parents were present, and this issue is important locally as nurses tend to rely on parental involvement to help promote their child's safety. A study of nurses' perception of unaccompanied hospitalized children suggested that nurses were concerned about their patients' safety during the absence of their parents. The nurses were placed in a difficult situation by having to put toddlers into cribs to keep them safe, which caused them to feel sorry for the child or by placing the child on a regular bed with a high risk of fall (Roberts, 2012).

Another typical condition in Indonesian rural hospitals is the condition of the bed. Therefore, three sub-items in environmental factors were added: wheel on cot/bed is damaged, infant or toddler, and >3 years old child in cot/bed without cotsides. The item was considered valid and reliable as some of the beds lacked functioning wheels or rails.

The nine-item PROF Scale developed for the study was found to be reliable and valid; once two items were removed. Having the scale adopted as a routine part of the nursing notes and completed on time proved difficult for the regular nursing staff, and the challenge for nursing administration is to provide sufficient education on falls and falls risk so that the nurses feel motivated and sufficiently knowledgeable about falls, and their impact on the health of patients and the economic impact of falls on the hospital.

## **CONCLUSION**

The PROF Scale demonstrated internal consistency, and the statistical correlations of the items contributed to the validity alongside the content and face validity from phase one and pilot testing. Since there were two invalid items, the scale needs further testing in similar settings, and also in a homogeneous sample of patients undergoing surgery and taking medication. Further studies should include a more in-depth analysis of pediatric patients' characteristics in the hospital where the falls occurred. Nevertheless, the PROF Scale presents as credible and easy to use, and future studies could address ways of raising nurses' and family awareness of the importance of systematically preventing falls through the adoption of such tools.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## REFERENCES

- Black, A. D., Car, J., Pagliari, C., Anandan, C., Cresswell, K., Bokun, T., & Sheikh, A. (2011). The impact of health on the quality and safety of health care: A systematic overview. *PLoS Medicine*, 8(1), 1-16. doi:10.1371/journal.pmed.1000387
- Choi, Y. S., Lawler, E., Boenecke, C. A., Ponatoski, E. R., & Zimring, C. M. (2011). Developing a multi-systemic fall prevention model, incorporating the physical environment, the care process and technology: A systematic review. *Journal of Advanced Nursing*, 67(12), 2501-2524. doi:10.1111/j.1365-2648.2011.05672.x
- Chromá, J. (2016). Risk of falling in pediatric nursing. *Central European Journal of Nursing and Midwifery*, 7(4), 542-548. doi:10.15452/CEJNM.2016.07.0027
- Dewit, S. C., & O'Neill, P. (2014). *Concepts and skills for nursing* (4<sup>th</sup> Edition). St. Louis: Elsevier.
- DiGerolamo, K., & Davis, K. F. (2017). An integrative review of pediatric fall risk assessment tools. *Journal of Pediatric Nursing*, 34, 23-28. doi:10.1016/j.pedn.2017.02.036
- International Council of Nurses (ICN). (2012). *The ICN code of ethics for nurses*. International Council of Nurses. Geneva: International Council of Nurses.
- Jamerson, P. A., Graf, E., Messmer, P. R., Fields, H. W., Barton, S., Berger, A., & Lunbeck, M. (2014). Inpatient falls in freestanding children's hospitals. *Pediatric Nursing*, 40(3), 127-135.
- Joint Commission International (JCI). (2012). *International patient safety goal*. Retrieved from <https://www.jointcommissioninternational.org/>
- Maslow, A. H. (1943). A theory of human motivation. *A Theory of Human Motivation*, 50, 370-396. doi:10.4324/9781912282517
- Mason, D., Isaacs, S., & Colby, D. (2011). *The nursing profession: Development, challenges, and opportunities*. New York: Jossey Bass.
- Miake-Lye, I. M., Hempel, S., Ganz, D. A., & Shekelle, P. G. (2013). Inpatient fall prevention programs as a patient safety strategy: A systematic review. *Annals of Internal Medicine*, 158(5 Pt 2), 390-396. doi: 10.7326/0003-4819-158-5-201303051-00005
- Ministry of Health Republic of Indonesia [MoHRI]. (2011). *Peraturan menteri kesehatan republik Indonesia [The regulation of ministry of health republic of Indonesia]*. Retrieved from <http://bprs.kemkes.go.id/v1/uploads/pdf/files/peraturan/21%20PMK%20No.%201691%20ttg%20Keselamatan%20Pasien%20Rumah%20Sakit.pdf>
- Pauley, B. J., & Houston, L. S. (2014). Clinical relevance of the humpty dumpty falls scale in a pediatric specialty hospital. *Pediatric Nursing*, 40(3), 137-142.
- Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia: Lippincott Williams Wilkins.
- Raeder, K., Siegmund, U., Grittner, U., Dassen, T., & Heinze, C. (2010). The use of fall prevention guidelines in German hospitals - A multilevel analysis. *Journal of Evaluation in Clinical Practice*, 16(3), 464-469. doi:10.1111/j.1365-2753.2009.01143.x

- Rasmus, I., & Davis, D. (2012). The epidemiology of falls in hospitalized children. *Pediatric Nursing*, 38(1), 31-35.
- Roberts, C. A. (2010). Unaccompanied hospitalized children - A review of the literature and incidence study. *Journal of Pediatric Nursing*, 25(6), 470-476.
- Roberts, C. A. (2012). Nurses' perceptions of unaccompanied hospitalized children. *Journal of Pediatric Nursing*, 38(3), 133-136.
- Ryan-wenger, N. A., Kimchi-woods, J., & Erbaugh, M. A. (2012). Challenges and conundrums in the validation of pediatric fall risk assessment tools nancy. *Pediatric Nursing*, 38(3), 159-168.
- Tzeng, H.-M. (2011). Nurses' caring attitude: Fall prevention program implementation as an example of its importance. *Nursing Forum*, 46(3), 137-145. doi:10.1111/j.1744-6198.2011.00222.x
- World Health Organization (WHO). (2013). Patients for patient safety: Partnerships for safer health care. Geneva: WHO

## **The Degree of Diabetic Wounds Affects Kidney Function Damage**

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### **ABSTRACT**

**Background:** The peripheral neuropathy is the cause of hospitalization for patients with diabetes mellitus (DM) and damages kidney function due to the circulatory system with high sugar levels. High sugar levels in DM patients with diabetic wounds can trigger glomerular damage resulting in the decrease of kidney function.

**Purpose:** This study aims to analyze the relationship between the degree of diabetic wounds and kidney functions in patients with DM.

**Methods:** A cross-sectional study was conducted on 723 DM patients who experienced diabetic wounds in a hospital in Mojokerto, East Java, Indonesia. A purposive sampling technique was used to recruit the samples. The data of this study were medical records of diabetic patients. A simple linear regression test was employed to analyze the data.

**Results:** The result showed that the degree of the diabetic wound was significantly related to kidney function damage ( $p=0.000$ ). The relationship between the degree of diabetic wounds and the decline in kidney function was shown by an R-squared value of 0.768, meaning that the degree of diabetic wound affected the decline of kidney function by 76.8%, while the 23.2% was affected by other factors.

**Conclusion:** The degree of diabetic injury affects the decline of kidney function in DM patients by 76.8%. Nurses should do health promotion about controlling blood sugar levels in DM patients with the prevention of four pillars of diabetes, including education, nutrition, physical activity, and stress.

**Keywords:** Diabetes mellitus; diabetic wounds; kidney function

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### **BACKGROUND**

Diabetes mellitus (DM) is a chronic metabolic disorder related to increased levels of glucose in the blood (Nejhaddadgar, Darabi, Rohban, Solhi, & Kheire, 2018).

According to the World Health Organization [WHO] (2016), the prevalence of diabetes among adults over 18 years reached 8.5%. Elevated glucose levels in the blood cause microvascular development (blindness, nephropathy, and neuropathy) and macrovascular degenerative complications (cardiovascular and stroke) due to uncontrolled blood glucose levels (Laddha & Kulkarni, 2019). According to Abu Al-Halaweh et al. (2017), most of the complications that occurred in 794 diabetic patients were; 307 patients (38.7%) having a history of microvascular disease, 239 patients (83%) having retinopathy, 83 patients (28.5%) having peripheral neuropathy, 18.9% having advanced nephropathy, and 12.2% experiencing myocardial infarction (MI).

Peripheral neuropathy is the cause of hospital care for the DM patients who experience the damage of kidney function because of high sugar levels, although this problem can be prevented (Chao-Hung, Kun-Der, Ke, & Liang, 2019). Patients with this disease have a higher risk of morbidity, mortality, and hypoglycemia than those who do not experience it (Chowdhury, Khan, Lasker, & Chowdhury, 2019). The prevalences of microalbuminuria, proteinuria, and a decrease in glomerular filtration rate are 36%, 8%, and 22%, respectively. The presence of albuminuria is a predictor of chronic kidney disease. Diabetic kidney disease, known as diabetic nephropathy, refers to kidney disease caused by diabetes (Carretero Gómez & Arévalo Lorigo, 2018).

Type-2 DM is the main cause of chronic kidney disease (CKD). CKD patients with type-2 DM have more significant morbidity and mortality and a risk of hypoglycemia than people who have normal kidney function. The impact of type-2 DM on the healthy population is based on its high prevalence and socioeconomic costs, because microvascular and macrovascular complications are the significant causes of death (Avogaro & Fadini, 2019). Based on the results of previous studies, 30-40% of people with type-1 DM and 20-30% of people with type-2 DM will suffer from diabetic nephropathy, which will eventually lead to kidney failure (Rivandi & Yonata, 2015). The occurrence of terminal kidney failure can affect the patients' quality of life (Sari & Hisyam, 2014). This complication arises from the presence of foot lesions and the possibility that diabetic patients will face amputation. Diabetic nephropathy becomes the most common cause of morbidity and the main determinant of death in diabetic patients (Laddha & Kulkarni, 2019).

Abu Al-Halaweh et al. (2017) in their study showed poor glycemic control in Palestine, while blood pressure and lipids were less poorly controlled. Other studies have also obtained that the risk of CKD and its severity in diabetic patients increase with age (Hughes-Carter, Liu, & Hoebeke, 2018). In the US, the incidence of end-stage renal failure in 2014 for those aged 22 to 44 years old was 128.8 per million. The incidence jumps to 1,265 per million for those aged 65 to 74 years and to 1,556 per million for those older than 75 years. National and international organizations assert that further research is needed concerning CKD in the elderly to guide screening and treatment better. The Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group recommends the following tests yearly for those with diabetes: (1) urine microalbumin-to-creatinine ratio, (2) estimated glomerular filtration rate (eGFR), and (3) serum creatinine. However, national data show that only 33.3% of medicare beneficiaries with diabetes had annual urine microalbumin screening, and 33.8% of people aged 65 and

elder with CKD obtained recommended serum creatinine, lipids, and microalbuminuria together with a medical evaluation (United States Renal Data System, 2018). Previous studies showed that peripheral neuropathy resulting in diabetic wounds was the most problem experienced by diabetic patients with kidney damage. However, little evidence was known about whether the diabetic wound affects kidney function in diabetic patients. Therefore, research to study the relationship between diabetes wounds and kidney function damage is needed.

## **PURPOSE**

The purpose of this study was to analyse the relationship between the degree of diabetic wounds and kidney function in patients with DM.

## **METHODS**

### **Research design**

The research design was a correlational analysis using a cross-sectional approach.

### **Samples and setting**

The population in this study was all diabetic patients who suffered from diabetic wounds in a hospital in Mojokerto District in 2018. The research used a simple random sampling method to obtain the total samples of 723 patients.

### **Research instrument and data collection**

The independent variable used in this study was the degree of diabetic injury with an ordinal data scale, and the dependent variable was kidney function with an interval data scale. Data were collected using secondary data from the medical records. These medical record data were medical diagnoses for the degree of diabetic wounds and laboratory results of serum creatinine for kidney function. The classification of kidney function damage in this study according to LFG values are; Degrees 1 with values of more than 90; Degrees 2 with values of 60-90; Degrees 3 with values of 28-59; Degrees 4 with values of 15-29; and Degrees 5 with values of less than 15.

### **Data analysis**

The data analysis used a simple linear regression test to determine the relationship between the degree of diabetic wounds and kidney function. Meanwhile, the statistical test for all analyses had a significance level of 95% (alpha 0.05).

### **Ethical consideration**

This study received ethical approval from the ethics committee at Sumber Gelagah hospital in Mojokerto, Indonesia. Furthermore, the ethical principles were also observed throughout this study.

## **RESULTS**

The characteristics of respondents in this study include gender and age. Table 1 shows that the majority of the respondents were women (59.8%) with 3rd degree of diabetic wounds (54.9%). The mean age and kidney functions were  $56.5 \pm 9.53$  years and  $43.5 \pm 18.25$ , respectively.

Table 1. Characteristics of respondents (n=723)

Characteristics of respondents	f	%
Age (Mean±SD)	56.5±9.532	
GFR (Mean±SD)	43.5 ± 18.25	
Gender		
Man	291	40.2
Woman	432	59.8
Degree of wound		
Degree 1	0	0
Degree 2	149	20.6
Degree 3	397	54.9
Degree 4	177	24.5

The model test obtained a *p*-value of 0.000, meaning that H<sub>0</sub> was rejected. This means that there was a relationship between the degree of diabetic injury and kidney function. In other words, the model can explain overall empirical data (Table 2).

Table 2. The model test of the degree of diabetic wounds to the decline in kidney function

Model	Sum of Squares	df	Mean Square	F	<i>p</i>
Regression	184801.514	1	184801.514	2389.423	0.000
Residual	55763.219	721	77.341		
Total	240564.733	722			

The level of the relationship among variables was strong, with the value of *r*-0.876 in a negative direction. It means that the higher the degree of the injury, the lower the kidney function would be (Table 3).

Table 3. Relationships between diabetic wound degrees and decreased kidney function

Model	Unstandardized Coefficients		Standardized Coefficients	Counted t	<i>p</i>
	B	Std. Error	Beta		
(Constant)	115.965	1.518		76.383	0.000
diabetic wounds	-23849	0.488	-0.876	-48.882	0.000

The estimated relationship was shown by the R-squared value of 0.768, meaning that the degree of diabetic injury affected the decline of kidney function by 76.8%, while 23.2% of the decrease in kidney function was affected by other variables (Table 4).

Table 4. The predictive value of the relationship

Model	R	R- Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.876	0.768	0.768	8.79440	1.804

## DISCUSSION

The results showed that patients with diabetic wounds had decreased kidney function in the degree of 3, 4 & 5. Decreasing kidney function depends initially on the underlying disease. In DM, there is an obstruction of blood vessel flow resulting in diabetic nephropathy, where there is an increase in glomerular pressure resulting in mesangial expansion, glomerular hypertrophy. It will cause a reduction in the filtration area, which leads to glomerulosclerosis (Lee & Chung, 2014). The high blood sugar levels in patients with diabetes mellitus who have diabetic wounds can lead to glomerular damage (Hughes-Carter et al., 2018). The condition can cause the kidneys to lose the ability to filter blood, so kidney failure and high blood pressure can also cause injury to the renal afferent arterioles. The worst condition is it can decrease infiltration, which causes diabetic nephropathy (Carretero Gómez & Arévalo Lorigo, 2018; Limkunakul et al., 2019). People with diabetes mellitus is potential to experience kidney damage, so they should take kidney function checks (Hsieh, Lee, Chen, Chang, & Han, 2016).

The high blood sugar levels will make the kidney structure change, and it will disturb the functions (Ghandour et al., 2018). Besides, the results of another study found that a significant proportion of people with type-2 DM have weak macro and microvascular complications (MICRO) and metabolic control. Incidence of complications of diabetic nephropathy patients is 86.5%, far higher than 58.6% of the control group (Chen, Wang, & Huan, 2017). Glucose control in patients with diabetes is not less important than lipid and blood pressure control since hyperglycemia is the single most important risk factor for MICRO: once MICRO boosts the risk of CVD and HF, not only in patients with diabetes, but also in the general population, and much more if several MICRO of them co-exist. For these reasons, MICRO should represent a concern for cardiologists who should search and treat these conditions as it is exactly equally important for the diabetologist to search and recognize the importance of macrovascular complications (Avogaro & Fadini, 2019).

Some investigators have preferred glomerular filtration rate (GFR) as the main parameter to detect glomerular injury in disturbances of glucose metabolism, considering that hyperfiltration is a high-risk condition for progressive kidney disease (Julia, de Almeida-Pititto, & Ferreira, 2019). GFR elevation is dependent on increased plasma flow and glomerular pressure, even in the absence of systemic hypertension. Hyperglycemia-related hyperfiltration is attributed to afferent arteriolar vasodilation that leads to intraglomerular hypertension, increased transcapillary protein loss, and tubular sodium reabsorption. Abnormal GFR can be normalized by plasma glucose control, and microalbuminuria has been considered the hallmark of early diabetic microvascular disease in the kidney. More recently, the International Society of Nephrology stated that prognosis to chronic kidney disease should be based on both AER and GFR. Therefore,



for the purpose of the present review, microalbuminuria and reduced GFR were taken as the major search terms (Lopes-Virella et al., 2019). Among the studies reviewed by Julia et al. (2019), the range of diabetic kidney disease (DKD) prevalence rates in prediabetes was wide, varying from a minimum of 4.5% to a maximum of 26.0%. Taking into consideration two studies in which diagnosis was based on eGFR or six studies that used ACR, rate variation was similar. Presuming that microalbuminuria should precede the reduction of GFR in the natural history of diabetic kidney disease (DKD), it could be expected higher prevalence rates using AER rather than GFR. Several factors could be contributing to these findings.

Based on a simple linear regression test, the results also obtained that the degree of diabetic injury affected the decline of kidney function by 76.8%, while 23.2% of the decrease in kidney function was affected by other variables. It is known that renal function is dependent on age, gender, genetic susceptibility, degree and duration of the hyperglycemic excursions, presence of comorbidities such as obesity, hypertension, smoking, and others. The main reason for such variability differences was age range, sample size, and genetic predisposition to renal diseases (Hsieh et al., 2016). Some of these factors also affect other problems in diabetic kidney disease (DKD).

The ways the disease is managed strongly influence the level of patient's productivity. Therefore, it is necessary to manage this disease comprehensively to make the patient's quality of life is optimal (Ghandour et al., 2018). The results of another study showed that the quality of life of patients with diabetes wounds is influenced by emotional factors, family, adherence, and friend support (Sari, Purnawan, Taufik, & Sumeru, 2018). Family empowerment affected family support in patients with type-2 DM. Support provided by the family to patients with diabetes makes patients have self-management to prevent complications (Luthfa & Ardian, 2019).

The implications of the finding were essential in the care of diabetic patients with or without diabetic wounds. Patients with impaired kidney function have a higher risk of developing diabetic wounds. It requires intensive preventive care, especially if they also experience peripheral neuropathy. The correlation between a decrease in creatinine clearance and an increase in ulcer formation is linear. Thus, patients with the lowest creatinine clearance level are at the highest risk. However, after the lesion develops, individuals with impaired kidney function can expect their injuries to be no more severe than patients with normal kidney function. Therefore, it is crucial to identify the burden of complications of type-2 DM and understand the factors which contribute to the policy and decision-making processes related to prevention, management, and glycemic control.

## **CONCLUSION**

The degree of diabetic wound affected the decline of kidney function. Diabetic wounds can trigger decreased kidney function because blood circulation in blood vessels decreases due to an increase in sugar levels. The continuous increase of blood sugar levels can cause damage to the glomerulus, which has a function as filtration in the nephrons in the kidneys. Therefore, people with diabetic wounds have a high risk of kidney function decline. As a recommendation, nurses should do health promotion

about controlling blood sugar levels in DM patients with the prevention of four pillars of DM, including education, nutrition, physical activity, and stress to be able to take care of diabetic patients to prevent injuries and if diabetes sores can prevent on kidney function problems.

#### **ACKNOWLEDGMENT**

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#### **CONFLICT OF INTEREST**

The authors declare no conflict of interest in this study.

#### **REFERENCES**

- Abu Al-Halaweh, A., Davidovitch, N., Almdal, T. P., Cowan, A., Khatib, S., Nasser-Eddin, L., & Baradia, Z. (2017). Prevalence of type 2 diabetes mellitus complications among Palestinians with T2DM. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 11(2017), S783-S787. doi:10.1016/j.dsx.2017.05.017
- Avogaro, A., & Fadini, G. P. (2019). Microvascular complications in diabetes: A growing concern for cardiologists. *International Journal of Cardiology*, 291, 29-35. doi:10.1016/j.ijcard.2019.02.030
- Carretero Gómez, J., & Arévalo Lorigo, J. C. (2018). Clinical assessment and treatment of diabetes in patients with chronic kidney disease. *Revista Clinica Espanola*, 218(6), 305-315. doi:10.1016/j.rce.2018.03.016
- Chao-Hung, C., Kun-Der, L., Ke, L. Y., & Liang, C. J. (2019). O-GlcNAcylation disrupts STRA6-retinol signals in kidneys of diabetes. *Biochimica et Biophysica Acta - General Subjects*, 1863(6), 1059-1069. doi:10.1016/j.bbagen.2019.03.014
- Chen, Q., Wang, J., & Huan, X. (2017). Comparative analysis of diabetic nephropathy and non-diabetic nephropathy disease. *Saudi Journal of Biological Sciences*, 24(8), 1815-1817. doi:10.1016/j.sjbs.2017.11.019
- Chowdhury, A., Khan, H., Lasker, S. S., & Chowdhury, T. A. (2019). Fasting outcomes in people with diabetes and chronic kidney disease in East London during Ramadan 2018: The East London diabetes in Ramadan survey. *Diabetes Research and Clinical Practice*, 152, 166-170. doi:10.1016/j.diabres.2019.05.022
- Ghandour, R., Mikki, N., Abu Rmeileh, N. M. E., Jerdén, L., Norberg, M., Eriksson, J. W., & Husseini, A. (2018). Complications of type 2 diabetes mellitus in Ramallah and Al-Bireh: The Palestinian Diabetes Complications and Control Study (PDCCS). *Primary Care Diabetes*, 12(6), 547-557. doi:10.1016/j.pcd.2018.07.002
- Hsieh, Y. L., Lee, F. H., Chen, C. L., Chang, M. F., & Han, P. H. (2016). Factors influencing intention to receive examination of diabetes complications. *Asian Nursing Research*, 10(4), 289-294. doi:10.1016/j.anr.2016.10.004
- Hughes-Carter, D. L., Liu, C. C., & Hoebeke, R. E. (2018). Improved screening and diagnosis of chronic kidney disease in the older adult with diabetes. *Journal for Nurse Practitioners*, 14(8), 626-632.e3. doi:10.1016/j.nurpra.2018.07.008
- Julia, B., de Almeida-Pititto, B., & Ferreira, S. R. G. (2019). Diabetic kidney disease in prediabetes. *Obesity Medicine*, 15, 100105. doi:10.1016/j.obmed.2019.100105

- Laddha, A. P., & Kulkarni, Y. A. (2019). Tannins and vascular complications of diabetes: An update. *Phytomedicine*, 56, 229-245. doi:10.1016/j.phymed.2018.10.026
- Lee, S. J., & Chung, C. W. (2014). Health behaviors and risk factors associated with chronic kidney disease in Korean patients with diabetes: The fourth Korean national health and nutritional examination survey. *Asian Nursing Research*, 8(1), 8-14. doi:10.1016/j.anr.2013.11.001
- Limkunakul, C., de Boer, I. H., Kestenbaum, B. R., Himmelfarb, J., Ikizler, T. A., & Robinson-Cohen, C. (2019). The association of glycated hemoglobin with mortality and ESKD among persons with diabetes and chronic kidney disease. *Journal of Diabetes and Its Complications*, 33(4), 296-301. doi:10.1016/j.jdiacomp.2018.12.010
- Lopes-Virella, M. F., Baker, N. L., Hunt, K. J., Hammad, S. M., Arthur, J., Virella, G., & Klein, R. L. (2019). Glycosylated sphingolipids and progression to kidney dysfunction in type 1 diabetes. *Journal of Clinical Lipidology*, 13(3), 481-491. doi:10.1016/j.jacl.2019.03.005
- Luthfa, I., & Ardian, I. (2019). Effects of family empowerment on increasing family support in patients with type-2 diabetes mellitus. *Nurse Media Journal of Nursing*, 9(1), 58-68. doi:10.14710/nmjn.v9i1.22501
- Nejhaddadgar, N., Darabi, F., Rohban, A., Solhi, M., & Kheire, M. (2018). Effectiveness of self-management program for people with type 2 diabetes mellitus based on PRECEDE PROCEED model. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 13(1), 440-443. doi:10.1016/j.dsx.2018.08.016
- Rivandi, J., & Yonata, A. (2015). Hubungan diabetes melitus dengan kejadian gagal ginjal kronik [Relationship between diabetic nephropathy and chronic kidney disease's prevalences]. *Medical Journal of Lampung University*, 4(9), 27-34.
- Sari, N., & Hisyam, B. (2014). Hubungan antara diabetes mellitus tipe II dengan kejadian gagal ginjal kronik di rumah sakit PKU Muhammadiyah Yogyakarta periode Januari 2011- Oktober 2012 [Relationship between type II diabetes mellitus and chronic kidney failure at PKU Muhammadiyah hospital on January 2011-October 2012]. *Jurnal Kedokteran dan Kesehatan Indonesia*, 6(1), 11-18.
- Sari, Y., Purnawan, I., Taufik, A., & Sumeru, A. (2018). Quality of life and associated factors in Indonesian diabetic patients with foot ulcers. *Nurse Media Journal of Nursing*, 8(1), 13-24. doi:10.14710/nmjn.v8i1.16815
- United States Renal Data System. (2018). USRDS annual data report. Retrieved from <https://www.usrds.org/adr.aspx>
- World Health Organization (WHO). (2016). *Global report on diabetes*. Retrieved from <https://www.who.int/diabetes/global-report/en/>

## **Are Nursing Students' Early Course and Perceived Performance Related to Their Final and Actual Course Performance?**

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### **ABSTRACT**

**Background:** Assessing the academic performance of students is imperative for nursing educators. While it is commonly accepted that performance in quizzes is linked with final examination performance, little published empirical data is available among nursing student samples.

**Purpose:** The purpose of this study was to determine the relationship between performance in regular short lecture quizzes and long quiz on the final examination performance of nursing students in a nursing course. Likewise, this study ascertained whether there is a significant relationship between perceived performance and actual performance in the final examination of the course.

**Methods:** A descriptive-correlational study design was used. All 138 second-year nursing students enrolled in the Community Health Nursing course were included in this study. Grades in short quizzes, long test, and final examination were analyzed, and a one item global scale was utilized to determine students' perceived performance in the final examination. Pearson's *r* was employed to determine the relationship between variables.

**Results:** Results revealed that performance in regular short lecture quizzes ( $p=0.000$ ) and long quiz ( $p=0.000$ ) were significantly correlated with final examination performance. Moreover, there was a significant relationship between perceived performance and actual performance in the final examination ( $p=0.000$ ).

**Conclusion:** This study suggests that early performance in the lecture course can significantly influence students' performance in the final assessment of the course. Nurse educators are encouraged to be proactive in identifying students who are at risk of performing poorly early in the course so that prompt remediation and guidance may be provided to students who are not performing well.

**Keywords:** Academic performance; actual grade; perceived grade; quizzes; nursing

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## **BACKGROUND**

Assessment of academic performance of students is imperative for nurse educators (Oducado & Penuela, 2014; Mthimunye & Daniels, 2019). Studies have shown that academic performance in nursing school is a significant predictor of the Nurse Licensure Examination, a key indicator of the quality of the nursing program (Banua, 2017; Oducado, Cendaña, & Belo-Delariarte, 2019). Assessment of students' performance is an integral component of the teaching and learning process as it determines whether or not the goals of the course are being met (Delaram, Shams & Gandomani, 2017). It is also one way to inform educational institutions of the success of their teaching-learning practices (Belo-Delariarte, Oducado, & Penuela, 2018). Formative assessment that occurs throughout the course intends to improve students' attainment of learning objectives (Theall & Franklin, 2010).

Assessing students' performance by giving regular quizzes throughout the course provides information regarding students' progress and learning gaps along the way. A study found that students value frequent graded assessments as a study motivator (Vaessen et al., 2016). On the other hand, a qualitative research disclosed that academic nursing staff experienced ambivalence in the timing of assessment and types of formative assessment (Koh, 2010). Moreover, critiques charge frequent testing in the academe to cause heightened anxiety among students and that it decreases the value of learning for learning sake (Paul, 2015).

While it is widely accepted that students who perform well in continuous assessment tests are likely to get a good final grade (Wambuguh & Yonn-Brown, 2013), to the researcher's knowledge, there is a limited number of published studies on this topic among nursing students. Additionally, there is little available research conducted within the local setting. Some researchers also noted inconsistent results on the effect of frequent examinations on students' learning (Zamini et al., 2013). For instance, studies of Zamini et al. (2013) and Bluman, Purchase, & Duling (2011) found no influence of quizzes on final examination performance.

Moreover, although earlier researchers cautioned on the use of self-reported grades (Kuncel, Credé, & Thomas, 2005) and that students have the propensity to overreport their grades (Zimmerman, Caldwell, & Bernat, 2002; Tejeiro et al., 2012), it is also important to study the ability of students to accurately self-evaluate course performance to ascertain that students do not under- or over-estimate their achievement levels (Sticca et al., 2017). In this study, students perceived performance in the final exam reflects their self-evaluation defined "as the process that involves the students making summative judgments about their work, leading to the assignment of a mark or self-grading" (Tejeiro et al., 2012).

## **PURPOSE**

The purpose of this study was to determine the relationship between performance or rating in regular short lecture quizzes and long quiz on the final examination performance or rating of nursing students in a nursing course. Also, this study

ascertained whether there is a significant relationship between perceived and actual performance in the final examination.

## **METHODS**

### **Research design**

This study employed a descriptive-correlational, cross-sectional research design.

### **Participants**

All second-year nursing students (n=138) enrolled in the Community Health Nursing course in the first semester of 2019 in one nursing school in the Philippines were the participants of the study.

### **Ethical considerations**

Ethical conduct of research was observed throughout the study. Students were informed of their voluntary participation in the study. All data remained confidential, and access was limited only to the researcher. Students were also informed that their participation or non-participation would not affect their grades.

### **Research instrument and data collection**

Grades in regular short quizzes, long test, and final examination of students were analyzed for this study. Students were given short regular quizzes (15 to 25 items) after the lecture, and the long exam (100 items) was given two weeks after all the topics in the course were covered. The final examination (70 questions) was administered at the end of the semester, which was a little more than one month after the lecture series and long test were conducted. The types of the test during quizzes were identification, true or false, enumeration and multiple-choice while the long test and final examinations were in multiple-choice format. All examinations were administered in a paper-and-pen format, although a study found the type of quiz administration does not significantly affect student performance (Sherman et al., 2019).

To determine perceived performance, students were requested to self-evaluate after the final test using a single item self-administered instrument. Students were asked to rate, on a scale of 1 to 10 (10 being the highest), how well they performed in the final examination of the course. Wanous, Reichers, & Hudy (1997) suggested that single item scales may be used to represent global constructs.

### **Statistical data analysis**

Descriptive statistics were utilized to describe the data while Pearson's *r* was employed to test for the relationship between variables. The statistical analysis was aided by IBM SPSS version 23. Alpha level of significance was set at .05.

## **RESULTS**

### **Participants profile**

Nursing students who participated in this study were in their second-year of the four-year baccalaureate nursing degree program. The majority (63%) of the students were females, typically within the age range of 19 to 21 years old with a mean age of 20.

### Performance in quizzes, long quiz and final examination

The performance of students in different tests is shown in Table 1. On the average, nursing students had satisfactory to very satisfactory performance ( $M=83.70$ ) in regular short lecture quizzes. They had good to very good performance ( $M=86.18$ ) in the long test and had satisfactory to very satisfactory performance ( $M=83.91$ ) in the final examination.

Table 1. Performance in short quizzes, long quiz, and final examination

Quiz and tests	<i>f</i>	%
Quizzes ( $M=83.70$ )		
Outstanding to Excellent (92.00 and above)	10	7.2
Good to Very Good (86.00-91.99)	50	36.2
Satisfactory to Very Satisfactory (80.00-85.99)	46	33.3
Passing-Fair (75.00-79.99)	17	12.3
Below 75	15	10.9
Long Quiz ( $M=86.19$ )		
Outstanding to Excellent (92.00 and above)	6	4.3
Good to Very Good (86.00-91.99)	72	52.2
Satisfactory to Very Satisfactory (80.00-85.99)	53	38.4
Passing-Fair (75.00-79.99)	7	5.1
Below 75	-	-
Final Exam ( $M=83.91$ )		
Outstanding to Excellent (92.00 and above)	7	5.1
Good to Very Good (86.00-91.99)	39	28.3
Satisfactory to Very Satisfactory (80.00-85.99)	70	50.7
Passing-Fair (75.00-79.99)	18	13.0
Below 75	4	2.9

### Perceived performance in the final exam

Students self-evaluation of their performance in the final examination is reflected in Table 2. The table shows that a high majority of nursing students perceived their performance to be at the average level ( $M=5.71$ ) in the final examination of the Community Health Nursing course.

Table 2. Perceived level of performance in the final examination

Level of Perceived Performance ( $M=5.71$ )	<i>f</i>	%
High (8.00-10.00)	8	5.8
Average (4.00-7.99)	124	89.9
Low (1.00-3.99)	6	4.3

### Correlation between variables

Table 3 displays the relationship between the variables included in this study. It can be gleaned in Table 3 that there is a significant positive relationship between regular short lecture quizzes performance ( $p=0.000$ ) and long quiz performance ( $p=0.000$ ) with final examination performance. Table 3 also shows that there is a significant positive

relationship between perceived performance and actual performance in the final examination of the course ( $p=0.000$ ).

*Table 3. Correlation between variables*

Variables	<i>r</i>	p-value
Short quizzes and final exam	0.510	0.000*
Long quiz and final exam	0.637	0.000*
Perceived performance and actual performance	0.335	0.000*

\* $p<0.05$

## DISCUSSION

This study investigated the correlation between students' performances in quizzes, long quiz and final examination. Not surprisingly, this study found that performance in regular short lecture quizzes and long test were significantly correlated with final examination performance. This finding may indicate that early performance in the course has a significant bearing in the final or terminal outcomes of the course. This result is consistent with the findings of Wambuguh & Yonn-Brown (2013), wherein regular lecture quizzes scores predicted final examination performance of college students in several courses. Poljicanin et al. (2009) likewise discovered that scores in daily mini quizzes were positively correlated with final examination performance of medical students in the anatomy course in Croatia. A similar finding was also disclosed in Iran with a sample involving nursing students in the study of Delaram et al. (2017). Authors concluded that weekly quizzes significantly increased students test scores in the midterm and final examinations of the Maternal and Child Health course. Azzi et al. (2014) likewise found that performance in formative assessment was related to the performance of medical students in the summative examination. Authors also relayed that the use of formative assessment was considered as a useful approach in identifying students at risk of failing. On the contrary, the study of Zamini et al. (2013) revealed that frequent announced quizzes did not influence the final exam score of medical students in Iran. In addition, although Bluman et al. (2011) were not conclusive, scholars relayed that the practice of giving review quizzes did not affect students' final exam performance in their study.

Moreover, the finding of this study also suggests that frequent assessment or regular testing has a positive impact on students' performance. Drill and practice, as in this case, the use of regular quizzes, promotes the acquisition of knowledge or skill through multiple repetitions, rehearsal, and practice (Lim, Tang, & Kor, 2012). Test-enhanced learning or testing effect considers test prompts to promote retrieval practice from memory, thereby enhances learning (Brame & Biel, 2015). A study among high school students found that daily quizzes had a positive influence on students' retention and mastery of the material (Kayser, 2015).

People's self-assessment holds a modest connection with their actual behavior and performance (Dunning, Heath, & Suls, 2004). It was demonstrated in this study that self-evaluation or perceived performance is related to actual performance in the final examination of the course. This means that students who viewed themselves to perform



well in the test were more likely also to get higher scores or perform well in the actual examination. This may reflect a relatively accurate self-evaluation of students regarding their performance in the test. This result of this study is consistent with the findings of Sticca et al. (2017) among high-school students and Laguador (2013) with freshmen engineering students in the Philippines. Landrum & Dillinger (2000) also found that 61% of students had an accurate prediction of their expected to actual grade. Correspondingly, realistic self-appraisal was found to be associated with academic performance of freshmen students (Adebayo, 2008).

It is also noteworthy that while the average students' performance in the long test was found to be higher compared to the average performance in the final examination, performance in regular lecture quizzes and final examination were relatively comparable. The time interval between the administration of the long test which was given two weeks after the lecture series and the final exam which was conducted more than one month after the lecture ended may have contributed to the higher ratings of students in the long test. While this is not a test-retest reliability study, test-retest correlations are found to decrease progressively as the interval lengthens (McAdams, 2009). Moreover, the finding of this study also suggests consistency in the early and final performance of students in course. It is recommended that nursing faculty must be proactive in identifying students at risk of underperforming early in the class. Additionally, academic guidance remains integral for nursing students (Oducado et al., 2017).

It is also interesting to note that despite performance in regular lecture quizzes and final examination were relatively comparable, this study demonstrated that the correlation between performance in the long and final exam was slightly higher than the correlation between regular short quizzes and final examination as indicated by the Pearson's correlation coefficient. It can be argued that this is because the long and final exams were administered in a similar multiple-choice format. This may direct the value of test administration in the same test item format. Some prior studies have shown that the format of the test items influences students' test performance (Thawabieh, 2016; Reardon et al., 2018).

Concerning the demographic profile of the students, similar to prior research conducted in a private nursing school (Oducado & Penuela, 2014), many nursing students in this study were females suggesting that nursing remains to be a female-dominated profession. It is also significant to acknowledge that participants in this study already belong to Generation Z or those born from 1995 to present (Oducado, 2019). This is interesting to note because this cohort is argued as a generation that is shaping the changes that are happening and will happen in the educational landscape (Oducado, 2019).

Since this study is only limited in a single course and college, it is suggested to use the findings with caution. Moreover, the use of non-standardized assessment in this study in the form of teacher-made tests may limit the validity, reliability and generalizability of the results. Nonetheless, the examinations used to assess students' performance were based on the content and objectives of the course merit a valid evaluation of students'

academic performance concerning the course or subject. Future researchers may work on a larger scale and use experimental designs and standardized measures to further validate the result of this study. This study has contributed to the body of knowledge on assessment in nursing education. Moreover, this study has provided current evidence and has documented within the context of nursing education a widely accepted notion that early course performance, as indicated by scores in regular quizzes, significantly contributes to the final course performance of students.

### **CONCLUSION**

This study concludes that students' performance in regular short lecture quizzes and long quiz are reasonable indicators of final examination rating. Consistent with the literature, this study suggests that early performance in the lecture course can significantly influence students' performance in the final assessment of the course. This study highlights the importance of regular and continuous assessment of students' performance. Moreover, this study indicates that nursing students appear to have a realistic expectation of their examination performance in the course. Nevertheless, nurse educators can introduce strategies to remind and encourage students to evaluate their performance truthfully and assess their learning accurately. In addition, nurse educators must be proactive in identifying students who are likely to perform poorly early in the course so that prompt remediation and guidance may be offered to underperforming students.

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### **CONFLICT OF INTEREST**

The author declares that he is the instructor of the course. Furthermore, the author declares that the study was conducted in the absence of any financial relationships that could be construed as a potential conflict of interest.

### **REFERENCES**

- Adebayo, B. (2008). Cognitive and non-cognitive factors: Affecting the academic performance and retention of conditionally admitted freshmen. *Journal of College Admission, 200*, 15-21.
- Azzi, A.J., Ramnanan, C.J., Smith, J., Dionne, E., & Jalali, A. (2014). To quiz or not to quiz: Formative tests help detect students at risk of failing the clinical anatomy course. *Anatomical Sciences Education, 8*(5), 413-420. doi:10.1002/ase.1488
- Banua, A.S. (2017). Determinants of performance of nursing graduates in licensure examination. *BU R&D Journal, 20*, 113-118.
- Belo-Delariarte, R.G.B., Oducado, R.M.F., & Penuela, A.C. (2018). Terminal assessment of core nursing knowledge in a state university. *Asia Pacific Journal of Multidisciplinary Research, 6*(2), 10-17.
- Bluman, J.E., Purchase, K., & Duling, C.T. (2011). Daily review quizzes: A hindrance or a help? *Proceedings of the 2011 American Society for Engineering Education Annual Conference & Exposition*, Paper AC 2011-1146.

- Brame, C.J. & Biel, R. (2015). Test-enhanced learning: The potential for testing to promote *greater* learning in undergraduate science courses. *CBE—Life Sciences Education*, 14, 1-12.
- Delaram, M., Shams, S., & Gandomani, H.S. (2017). Effect of quizzes on test scores of nursing students for learning maternal and child health. *Journal of Medical Education*, 16(2), 118-122.
- Dunning, D., Heath, C., & Suls, J. M. (2004). Flawed self-assessment: implications for health, education, and the workplace. *Psychological Science in the Public Interest*, 5(3), 69-106. doi:10.1111/j.1529-1006.2004.00018.x
- Kayser, J.A. (2015). *The effect of daily quizzes on student learning in the advanced placement chemistry classroom* (Master's thesis). Montana State University, Bozeman, Montana
- Koh, L.C. (2010). Academic staff perspectives of formative assessment in nurse education. *Nursing Education in Practice*, 10(4), 205-209. doi:10.1016/j.nepr.2009.08.007
- Kuncel, N.R., Credé, M., & Thomas, L.L. (2005). The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. *Review of Educational Research*, 75(1), 63-82. doi:10.3102/00346543075001063
- Laguador, J. (2013). Academic performance of freshman engineering students based on their perception and actual final grades. *Journal of International Academic Research for Multidisciplinary*, 7(1), 1-8.
- Landrum, R.E., & Dillinger, R.J. (2000). Student perceptions of grading practices: Does "average" class performance equal a "C" grade? *The Journal of Research and Development in Education*, 34(1), 86-92.
- Lim, C.S., Tang, K.N., & Kor, L.K. (2012). *Drill and practice in learning (and beyond)*. In: Seel N.M. (eds) *Encyclopedia of the Sciences of Learning*. Boston, MA: Springer.
- McAdams, D.P. (2009). *The person: An introduction to the science of personality psychology*. New York, NY: John Wiley & Sons, Inc.
- Mthimunya, K., & Daniels, F. M. (2019). Predictors of academic performance, success and retention amongst undergraduate nursing students: A systematic review. *South African Journal of Higher Education*, 33(1), 200-220.
- Oducado, R.M.F. (2019). Gen Z nursing students' usage, perception and satisfaction with Facebook for educational purposes: Tool for learning or distraction. *Indonesian Nursing Journal of Education and Clinic*, 4(1), 79-89. doi:10.24990/injec.v4i1.241
- Oducado, R.M.F., Cendaña, D.P., & Belo-Delariarte, R.G.B. (2019). Institutional competency assessment and other factors influencing the nurse licensure examination. *International Journal of Scientific & Technology Research*, 8(11), 268-270.
- Oducado, R.M.F., Frigillano, P.R.S., Gunce, J.J.T., Jover, P.L.B., Meliton, P.N., & Pangilinan, K.T. (2017). Guidance needs of nursing students in Iloilo City, Philippines. *PEERS Inc. Multidisciplinary Research Journal*, 1(2), 35-47.
- Oducado, R.M.F., & Penuela, A.C. (2014). Predictors of academic performance in professional nursing courses in a private nursing school in Kalibo, Aklan, Philippines. *Asia Pacific Journal of Education, Arts and Sciences*, 1(5), 21-28.

- Paul, A.M. (2015). Researchers find that frequent tests can boost learning. *Scientific American*. Retrieved from <https://www.scientificamerican.com/article/researchers-find-that-frequent-tests-can-boost-learning/>
- Poljicanin, A., Carić, A., Vilović, K., Kosta, V., Marinović Guić, M., Aljinović, J., & Grković, I. (2009). Daily mini quizzes as means for improving student performance in anatomy course. *Croatian Medical Journal*, 50(1), 55-60. doi:10.3325/cmj.2009.50.55
- Reardon, S.F., Kalogrides, D., Fahle, E.M., Podolsky, A., & Zárate, R.C. (2018). Relationship between test item format and gender achievement gaps on math and ELA tests in fourth and eighth grades. *Educational Researcher*, 47(5), 284-294. doi:10.3102/0013189X18762105
- Sherman, T.J., Harvey, T.M., Royse, E.A., Heim, A.B., Smith, C.F., Romano, A.B., ..., & Holt, E.A. (2019). Effect of quiz format on student performance and answer-changing behaviour on formative assessments. *Journal of Biological Education*, 1-15. doi:10.1080/00219266.2019.1687106
- Sticca, F., Goetz, T., Bieg, M., Hall, N.C., Eberle, F., & Haag, L. (2017). Examining the accuracy of students' self-reported academic grades from a correlational and a discrepancy perspective: Evidence from a longitudinal study. *PLoS ONE*, 12(11), e0187367. doi:10.1371/journal.pone.0187367
- Thawabieh, A.M. (2016). A comparison between two test item formats: Multiple-choice items and completion items. *European Centre for Research Training and Development UK*, 4(8), 32-43.
- Tejeiro, R.A., Gomez-Vallecillo, J.L., Romero, A.F., Pelegrina, M., Wallace, A., & Emberley, E. (2012). Summative self-assessment in higher education: Implications of its counting towards the final mark. *Electronic Journal of Research in Education Psychology*, 10, 789-812.
- Theall, M., & Franklin J.L. (2010). Assessing teaching practices and effectiveness for formative purposes. In: *A Guide to faculty development*. K.J. Gillespie & D.L. Robertson (Eds). San Francisco, CA: Jossey Bass.
- Vaessen, B.E., van den Beemt, A., van de Watering, G., van Meeuwen, L.W., Lemmens, L. & den Brok, P. (2016). Students' perception of frequent assessments and its relation to motivation and grades in a statistics course: a pilot study. *Assessment & Evaluation in Higher Education*, 42(6), 872-886. doi:10.1080/02602938.2016.1204532
- Wambugh, O. & Yonn-Brown, T. (2013). Regular lecture quizzes scores as predictors of final examination performance: A test of hypothesis using logistic regression analysis. *International Journal for the Scholarship of Teaching and Learning*, 7(1), Article 7. doi:10.20429/ijstl.2013.070107
- Wanous, J.P., Reichers, A.E., & Hudy, M.J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology*, 82, 247-252.
- Zamini, G., Khadem Erfan, M. B., Rahmani, M. R., Khodavaisy, M. S., & Davari, B. (2013). Effects of frequent announced parasitology quizzes on the academic achievement. *Iranian Journal of Parasitology*, 8(4), 617-621.
- Zimmerman, M.A., Caldwell, C.H., & Bernat, D.H. (2002). Discrepancy between self-report and school-record grade point average: Correlates with psychosocial outcomes among African American adolescents. *Journal of Applied Social Psychology*, 32(1), 86-109. doi:10.1111/j.1559-1816.2002.tb01421.x

## ***Amo Ergo Sum – I love, Therefore, I am – Emotional Synchrony: A Norris’ Method of Concept Clarification***

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### **ABSTRACT**

**Background:** Nursing is an interpersonal process that requires a deeper emotive-caring and communion-encounter with a higher degree of emotional synchrony. However, the social, cultural, ethical, economic, legal, and technological demands make it intangible and indefinable.

**Purpose:** To identify and delineate the antecedents, defining attributes, and outcomes of emotional synchrony using both empirical and theoretical literature.

**Methods:** This concept analysis used the Norris’ method of concept clarification. Electronic databases such as OVID, Web of Science, CINAHL, PsychInfo, SocIndex, PubMed, and ProQuest were used to search the keyword ‘emotional synchrony.’ There were fifty-two sources included in the inductive thematic analysis to identify, analyze, recognize, and report the themes generated from the corpus. The discussion is grounded in light of the Theory of Nursing as Caring to elucidate its utility within the parlance of nursing as caring.

**Results:** The Model of Patterning Emotional Synchrony offers a new perspective toward a meaningful synchronous experience in the communion of beings that illuminates a soul-felt connectedness through the encounter, presence, and bond. The emotional synchrony’ is a phenomenon of caring integration where an intricate dance through a triadic-synchronistic rhythm of fusion, attunement, and effervescence contribute to the personhood, growth in reflection, and capacity to care. Also, as the emotional synchrony becomes an outward expression of caring, and as a manifestation of healing-caring-moment, the person embodies caring as a mode of being and views all persons as caring.

**Conclusion:** The model explicates that it is the emotional synchrony where the person develops a soul-felt connection with others. It is with emotional synchrony that refuels the synergy and transcendence towards a communion of beings to embody *Amo Ergo Sum—I love, therefore, I am*.

**Keywords:** Communion of beings; concept clarification; emotional synchrony; nursing as caring

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## BACKGROUND

Philosophers, psychologists, and other scholars' broad perspectives on emotion come to fruition. To some, emotion is a mental and physiological state that plays a central role in the lives of humans and other animals. The “basic emotions are designed to deal with inter-organismic encounters between people, or between people and animals...mobilize an organism to deal quickly with important interpersonal encounters” (Ekman, 1992, p. 171). The existence of emotion encompasses emotion families having similar characteristics or variations along with distinctive universal signals (e.g., facial expressions), unique physiology (e.g., emotion-specific physiology), and distinctive universal in antecedent events (e.g., social learning experiences) (Ekman, 1992). Emotion also encapsulates a bio-psycho-social and cultural affective phenomenon inherently manifesting in the first life-tasks for evolution, adaptation, and existence. These views on emotions contributed to other researchers to expand their field. For Ekman (1992), emotion is a by-product of human evolution experiences, whether real or imagined, explicit or implicit, is inherent, unique, and embodied in culture. The individual is a socio-adaptive system possesses a complex emotion communicated through language and develops an adaptive advantage to predict the intentionality of others, to coordinate shared experience, and to enhance social interaction (Schimmack, Oishi, & Diener, 2002; Williams & Bliss-Moreau, 2016).

Emotion is inherent to each person, manifests in different forms, and a requisite for human relations. Emotion as a subject or phenomenon of interest has received much attention in many fields, including medical neurosciences, social, psychology, behavioral sciences, engineering, and robotics. Emotion, like any other intertwining concept, plays a significant role in nursing as much as its practice is concerned. The transactional relation is inevitable between nurses and patients through pre-orientation, orientation, working, and termination phase within the context of caring, sharing, and goal orientation (Hagerty & Patusky, 2003). More often, the nurse-patient relationship (NPR) develops in a linear hierarchical progression, requires trust before initiation, time-bound, and conforms to a fix-it mechanism of doing nursing for role expectations (Hagerty & Patusky, 2003). This conventional view of NPR governs the everydayness of the nursing practice environment to date and shaped by social, cultural, ethical, economic, legal, and technological trends. These trends also contribute to NPR that changes over a period that needs a refocus on how a person should value other's humanness and value of human relationships.

How does the practice of nursing emulate emotion to elicit the communion of beings? What are the intricate ingredients for the nurse and patient to immerse in mutual and communal relationships in a shared flow of emotion? How does a nurse-patient caring

come in-synch? These questions prompted the researchers to clarify, delineate, and identify the antecedents, defining attributes, and consequences of emotional synchrony.

### **Synchrony and synchronicity in literature**

Merriam-Webster Dictionary (2018) defined synchronicity (n.) as “the coincidental occurrence of events and especially psychic events that seem related but are not explained by conventional mechanisms of causality.” Jung (1973) surmised that synchronicity is the connection between psychic factor and the flow of events and “through this infiltration of a psychic, non-material, factor into the material world that the phenomenon of synchronicity comes into play” (Jung, 1960 cited in Lawson, 2008, p. 269) but “[are] difficult to establish a manageable statistical universe (Jung, 1960 cited in Lawson, 2008, p. 274). Beitman (2011) introduced the term ‘simulpathity’ as a specific subclass of synchronicity and referred to “a simultaneous experience by one person of another person's distress but occurs without conscious awareness and at a distance” (p. 568). On the other hand, Merriam-Webster Dictionary (2018) defined synchrony as “a state in which things happen, move, or exist at the same time.” Leclère et al. (2014) defined synchrony as a dynamic and reciprocal adaptation of the temporal structure of behaviors and shared effect between interactive partners associated with mutuality, reciprocity, rhythmicity, harmonious interaction, turn-taking, and shared effect. Bernieri, Reznick, and Rosenthal (1988) classified the definition of synchrony into three criteria: (a) as biological rhythms and congruence, (b) the quality of simultaneous behaviors, and (c) as a perceptual, social phenomenon that unifies behaviors into a meaningful described whole.

Original works of nurse theorists accounted for their description of synchronicity and synchrony in general. Rogers (1970), in her Theory of Science of Unitary Human Beings, postulated the principles of homeodynamics that conveys the dynamic, ever-changing nature of life and the world (i.e., nature, process, and context of change). This theory explains the nature and process of change in the human-environmental field process grounded in resonancy, helicy, reciprocity, and synchrony. For Rogers (1970), synchrony is a change in the human field and simultaneous state of the environmental field at any given point in space-time. For Newman (1997), 'synchrony', as stated in Theory of Health as Expanding Consciousness is an interconnectedness of the entire living system towards expanding consciousness and applied through the nurse-client interaction. This theory further posits the experience of health within the illness, and disruptive situations lead to a catalytic effect that facilitates movement to higher levels of consciousness (Alligood, 2014). Parse (1987), in her Theory of Humanbecoming, postulated three principles: structuring meaning, configuring rhythmical patterns, and cotranscending with possibles. For Parse (1987), synchrony is a "facilitating transcendence through explication, dwelling with, and moving beyond" (p. 169). Hagerty and Patusky (2003) developed the Theory of Human Relatedness where humans are viewed as “relational beings who experience some degree of involvement with external referents, including people, objects, groups, and natural environments” (pp. 147-148). Based on this theory, relatedness consists of four states of relatedness—connection, disconnection, enmeshment, and parallelism, are based on levels of involvement and comfort” (p. 148). In a similar vein, Hagerty, Lynch-Sauer, Patusky, and Bouwsema (1993) also theorized in their early works four processes or social

competencies essential in establishing relatedness, including a sense of belonging, reciprocity, mutuality, and synchrony.

The practice of nursing embodies a traditional, medical, and high-technology approach to care. The nurse's competency requires the ability to manage specialized care efficiently, but the emotional connection with the patient weakens their technology, cognitive, and competent judgment (Krejci, 1995). Krejci (1995) asserts that synchrony is a quintessential element of nursing practice. Based on her interview, seasoned expert nurses agreed to have the power to facilitate synchrony by connecting with their patients, nurses, and the entire healthcare system. Krejci (1995) further defined synchrony as "movement of harmonious intraaction and interaction" while synchronicity refers to the "meaningful events unexplained by causal reality" (p. 26). Furthermore, the interview accounts, seasoned nurses associated synchrony with balance, harmony, and wholeness where greater knowledge takes a form of synchronistic events, understanding important influences of health problems even without specific objective data referring to 'just knowing.' Krejci (1992) even suggested that synchrony is a 'way of knowing' and requires nurses' actions to accomplish synchrony through "tuning in, getting clients to tell their stories, holistic listening, knowing, and moving with" (p. 189). The nurse as a 'synchroscope' is an instrument assisting the patient in moving toward synchrony.

Chinn and Kramer (2015) associated synchrony with the aesthetic and art of nursing to form the aesthetic experience using synchronous narrative and movement known as transformative art or act. Also, in synchrony, there are coordination and rhythm of the experience between intention and action to form an integral whole. This definition further refers to the ability to make moves that are transformative towards a deeper understanding of nursing (e.g., relevant theory, facts, technical skill, personal knowing, and ethical understanding) and requires rehearsal in the deliberative application (Chinn, Maeve, & Bostick, 1997). In philosophy in nursing, Brencick and Webster (2000) mentioned, "synchrony is a pattern among the changes over time that is melodic and rhythmically beautiful" (p. 174) needed for self-discovery, sensitivity, and harmony with the cosmos. Hartrick (1997) postulated the five relational capacities leading to caring-relation, which include (a) initiative, authenticity, and responsiveness, (b) mutuality and synchrony, (c) honoring complexity and ambiguity, (d) intentionality in relating, (e) re-imagining. In this sense, "mutuality refers to the experiencing of commonalities of vision, goals, sentiments, or characteristics and acknowledgment of differences [while] synchrony involves congruence between a person's internal rhythms and external interaction with other" (p. 526).

Even early studies surmised that synchrony is an important concept related to nursing. For instance, Athlin and Norberg (1987) observed helplessness, dependence, and lack of communicative skills during feeding between nurses and their demented patients. Athlin and Norberg (1987) posited that through a signal model, the patient sends cues to his caregiver who must be sensitive enough to perceive these cues through repeated interactions leading to a non-verbal mutual understanding. Norberg and Athlin (1987) also postulated clarity of cues, sensitivity, interpretation, responsiveness, and synchrony are inherent to a nursing concern. These studies contributed to a theoretical model for



different phases of interaction during the meal and focused on the socio-emotional content versus the task content of the communication. Whall (1981) mentioned that synchrony is related to the context of providing holistic care to individual and family while dysynchrony is a tension which co-exists with unprovided care. Quinn (1989) opined that a nurse is the one who moves with another to facilitate self-healing and emphasized that nurses enter health care to be healers but find themselves immersed in a technological rather than the human environment. In the context of nursing education, Tarnow and Butcher (2005) integrate the art of nursing in teaching fundamental nursing skills using art and poetry, magazines and advertisements, and videotaping grounded in the body-mind-heart concept of Chinn et al. (1997). In so doing, those integrated approaches help the students to develop synchrony, skillfulness, caring, aesthetic behaviors, and in changing less effective behaviors (Tarnow & Butcher, 2005). Synchrony has also been present in online education where Frazer, Sullivan, Weatherspoon, and Hussey (2017) surmised that effective teachers should work in synchrony with the student to achieve academic success and long-term preparation for their professional roles. However, this area is beyond the scope of this concept clarification.

Nursing is an interpersonal process (Benner & Wrubel, 1989; Hagerty et al., 1993; Leininger, 1988; Orlando, 1961; Peplau, 1988; Watson, 1985) and requires an emotive-caring and communion-encounter with a higher degree of emotional synchrony and the paucity of evidence led to this concept clarification to identify its definition, antecedents, attributes, and consequences.

## **PURPOSE**

This study aimed to identify and delineate the antecedents, defining attributes, and outcomes of emotional synchrony using both empirical and theoretical literature.

## **METHODS**

### **Norris' method of concept clarification**

The development of a concept in nursing has received much attention in the past several decades. The development of multifaceted nursing concepts strengthens its scope of practice. However, concepts need further exploration, elaboration, and clarification because nursing knowledge continues to evolve associated with the dynamic complexities and ever-changing health systems (Norris, 1982; Rodgers, 2000). Norris (1982) described a concept as a basic idea, an abstraction of particular events, or a word symbol that bridges and reconnects empirical science to the real world.

Further, Norris explicated that concepts are “generalizations about particulars, such as for cause and effect, duration, dimension, attributes, and continua of phenomenon or objects” (p. 11). Norris (1982) proposed that concepts described in the past need clarification and operationalization for updated uses. The emerging concepts can be integrated into a model as a product of critical thinking and a creative mode of inquiry. This concept clarification helps the researchers to immerse and further explore a phenomenon of interest through an inductive iterative approach (see Figure 1).

The university electronic databases (e.g., OVID, Web of Science, CINHALL Plus, PsychInfo, SocIndex, PubMed, ProQuest, Scopus, and Google Scholar) were used to search the keyword ‘emotional synchrony’ to identify the meanings and essences of the concept. We initially reviewed a total of 183 sources from a wide range of studies with no specific methodological standards, including peer-reviewed journals, dissertations, and books, research, conceptual studies, with no exceptions to a year of publication. We reviewed the titles and abstracts and selected the relevant articles addressing the definition, attributes, and consequences of the concept. Eighty sources were eligible, of which we excluded 25 because of inadequate methodological rigor, no precise definitions attribute and grounded in theory, editorial, conference paper without complete details, no available full-text, and newspaper/opinion. There were 52 sources chosen for final inclusion and analysis (see Figure 2).

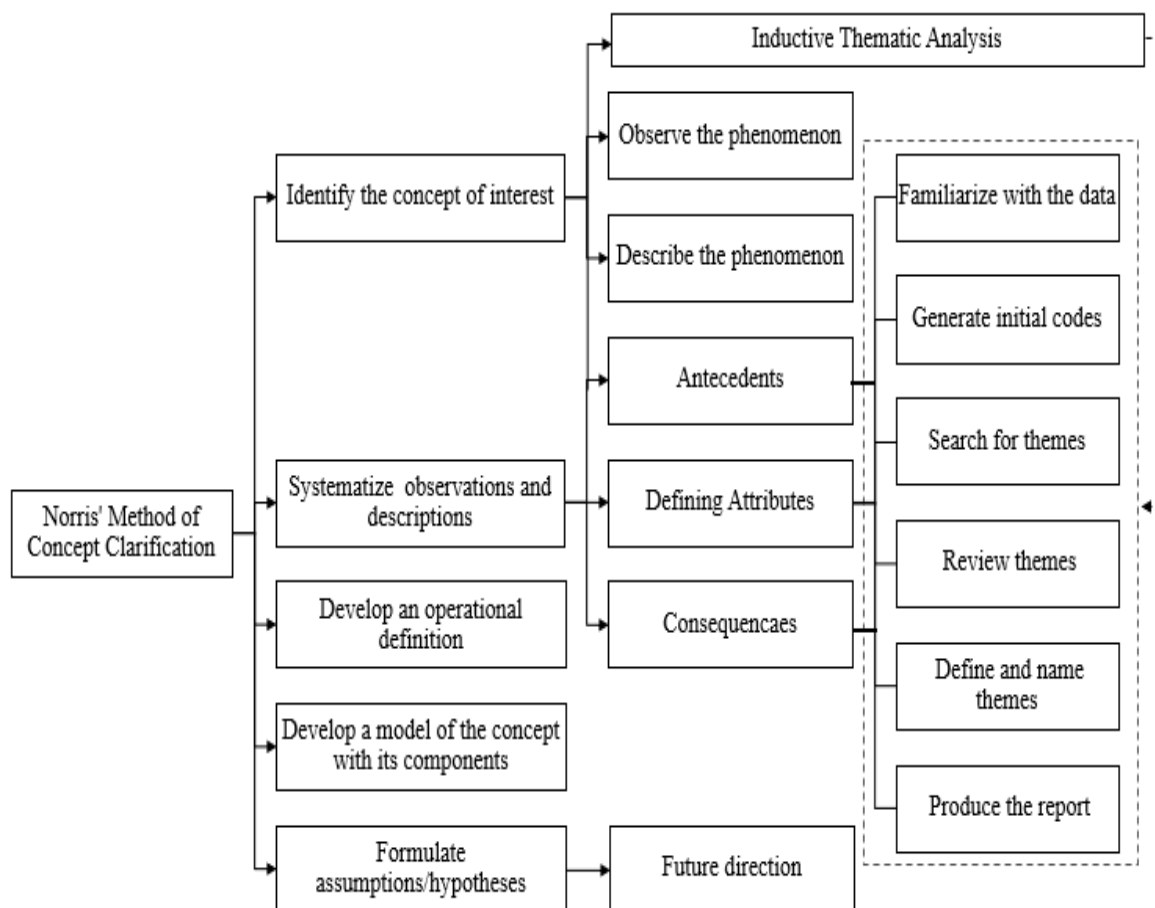


Figure 1. Norris' method of concept clarification

The inductive thematic approach was used to identify, analyze, recognize, and report the themes generated from the corpus (Braun & Clarke, 2006). We manually read and re-read each source to be familiar with the content and developed a logbook for the initially generated codes. The codes during the initial phase were tabulated, categorized, and examined continuously to identify essential themes. Words, phrases, and sentences

which contributed to the explication of the identified themes or conceptual categories were sorted, merged, and edited by retrieving, switching, entering and exiting from one document to another. Exemplars from selected sources were used to describe the meaning and essence of the concept (see appendix, Table 1).

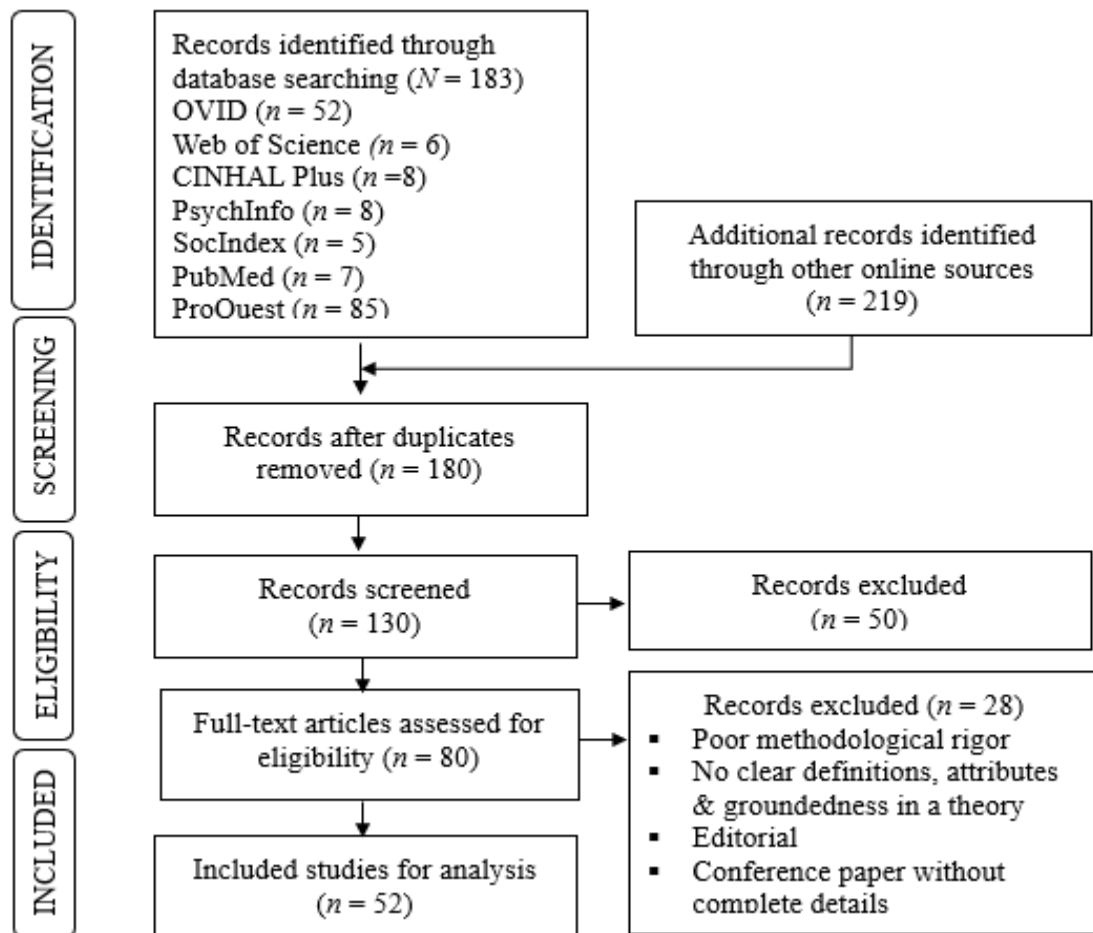


Figure 2. Flow chart detailing of studies through the review

## RESULTS

The concept of synchrony is a well-researched phenomenon across disciplines (e.g., medical neurosciences, social, psychology, behavioral sciences, engineering, and robotics), across the population (e.g., mother-infant, mother-child, couples), across ages (e.g., infants, adolescents, adults), and across human experiences (e.g., fear, anxiety). However, there is a dearth of evidence in recent years about emotional synchrony published either theoretical or empirical literature in nursing. Thus, this concept clarification offers a new perspective while it is grounded in the Theory of Nursing as Caring (Boykin & Schoenhofer, 2001) to elucidate its use within the parlance of nursing and caring. Figure 3 describes a model of emotional synchrony this study offers

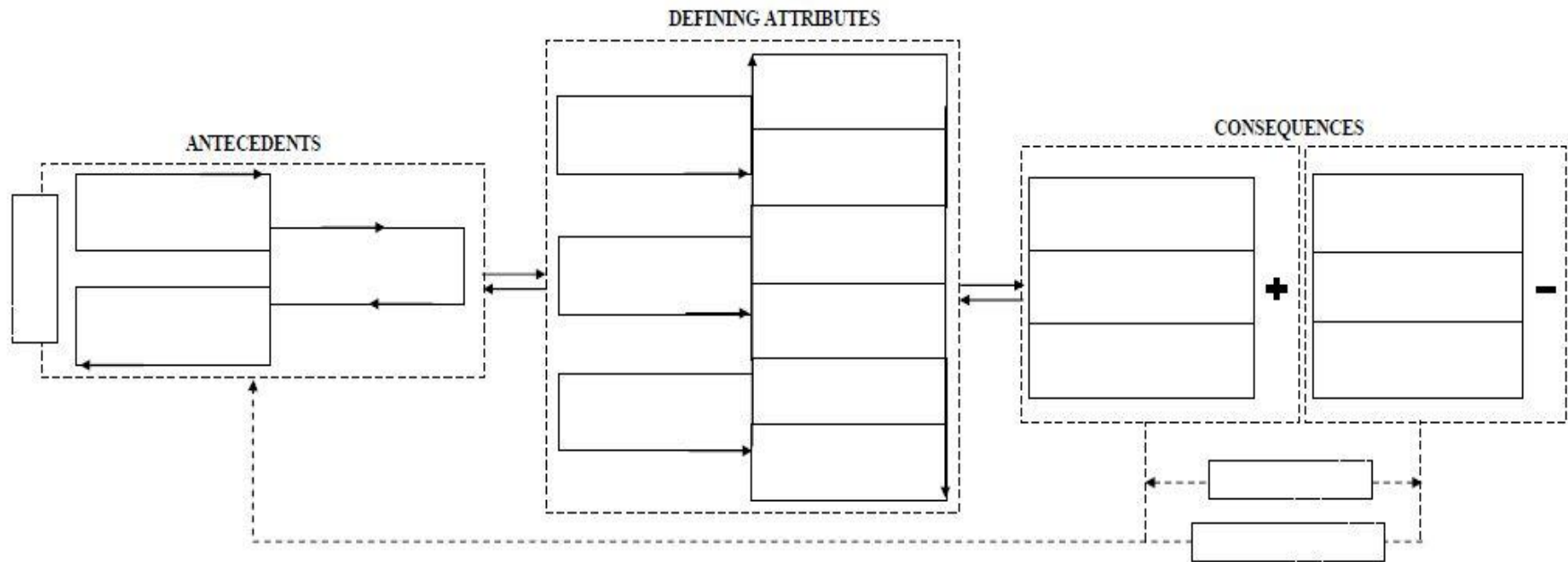


Figure 3. Model of Patterning Emotional Synchrony

### **Antecedents: Triadic experiences of person (I) – Other (You) – We**

Antecedents are the factors that precede and impact the experience of the concept (Rodgers, 2000). The emotional synchrony requires a flow of feelings, thoughts, and perceptions of meaningful experiences from moment to moment. The person forms a synchronous unity with others, events, environment, or cosmos. The person is aware that others have a distinct personality, live life in one's unique way, have mental capacities and moral attributes, and vary in age, culture, education, gender, life experiences, culture, religion, and beliefs (Kimura & Daibo, 2006). "I am aware of myself" as being-in-the-world with an integrated system of thoughts, emotions, lived events, and sense-experiences. The person's individuality becomes clear, in their values, relationships with others, emotional responses, behavior, wishes, and preferences. This awareness facilitates the person to recognize the value of self-knowing, deepens the acceptance of essential relationships, emboldens the consciousness of one's truth, and enables the recognition of factors that block authenticity.

The Other is a co-essential in existence, which also realizes the sameness to treat the other, not just by alterity but also in sameness or similarity. The Other enters in an authentic relation through one's involvement in other's being. The similarity of the structures of person and others will encounter the same feelings that they go through in their actual experiences. According to Zumeta, Oriol, Telletxea, Amutio, and Basabe (2016), in an experience where there is a shared emotion, it yields a relational involvement, achieves well-being, intensifies social integration, and builds an identity fusion. When a person and others meet through meaningful experience, it further strengthens their positive beliefs, social cohesion, interaction, and communication (Kimura & Daibo, 2006; Paez, Rime, Basabe, Wlodarczyk, & Zumeta, 2015).

The person and other as they immerse continuously, they learn to understand the dynamics of co-construction and conceptual representation of interpersonal relations (Gendron & Barrett, 2018; Koudenburg, Postmes, & Gordijn, 2017). Persons are relational beings who experience some degree of involvement with external referents (Hagerty et al., 1993; Hagerty & Patusky, 2003; Hartrick, 1997) and when they learn to affirm the sameness of each other, they influence their emotional responses to enact shared values, and sense of connection (Humphrey, Burch, & Adams, 2016). Hence, this embodied relation becomes pivotal to the formation of mutual and communal relationships (Koudenburg et al., 2017), social bonding (Rennung & Göritz, 2015), collective behaviors (Paez et al., 2015), and collective efficacy. Paez et al. (2015) further assert that in participation, they infuse emotional energy to enhance positive affect, thoughts, and emotions. As a result, they both strengthen their perceived similarity, unity, and entitativity.

### **Defining attributes**

Rodgers (2000) asserts that the identification of the attributes represents the primary accomplishment of the concept analysis and constitutes a definition of the concept. Three defining attributes of emotional synchrony emerged in the data: emotional encounter, emotional presence, and emotional bond.

The first attribute, *emotional encounter*, involves a meaningful situation, experience, or coincidence where at first, a feeling of unfamiliarity or strangeness emerges because of having no clear picture of the situation of the other. Many images from various past experiences, either positive or negative, will create an enormous toll of emotional challenges. However, the person regulates oneself in a composure that conveys trust and oscillates emotional channels as an automatic emotional response (Arizmendi, 2011; Butler & Randall, 2013; James, Andershed, Gustavsson, & Ternestedt, 2010). Also, emotional knowing becomes a vehicle for understanding various emotional rooms (e.g., normative, safe-secure, critical, affinity & closeness) (James et al., 2010) and provokes “ways of perceiving and understanding the self and the world” (Chinn & Kramer, 2008, p. 2). The person leads to imagining and later on understanding what specific situation other is experiencing at the moment. The second attribute, *emotional presence*, is the involvement of two or more people who can be fully present (Butler & Randall, 2013; Gendron & Barrett, 2018; Parse, 1987). Being present opens a way toward compassion, emotional responsiveness, and engagement. When the person chooses to be present emotionally, one feels connected to the tapestry of self-experience and other-experience, (James et al., 2010; Lindsey, Colwell, Frabutt, Chambers, & MacKinnon-Lewis, 2008; Valdesolo & Desteno, 2011). Presence lays the foundation to adapt to a complex social environment and framed by a moral vision of the self (Lee, Miernicki, & Telzer, 2017; McCarthy, Fergus, & Miller, 2016; Parse, 1987). The person says, “I am here with you,” and the presence becomes an outward expression of co-construction between self-experience and other-experience (Gendron & Barrett, 2018; Kuhn et al., 2011; Morley, Holman, & Murray, 2017). The third attribute, *emotional bond*, refers to the ties that connect between the person and others. This bond links with compassionate acceptance and authenticity to the plight of those around us interests us in their well-being, and motivates us to help on their behalf (Debrot, Schoebi, Perrez, & Horn, 2013; Valdesolo & Desteno, 2011; Whall, 1981). Wagner et al. (2015) mentioned that people have a strong tendency to affiliate with other people, especially in emotional situations, and contribute to the regulation of evolved emotions. As such, the person and the other share simultaneous movement, tempo similarity, coordination, and smoothness in their relationships (Kimura & Daibo, 2006; Wagner et al., 2015; Whall, 1981; Wiss & Tordjman, 2016). The mother-child bond is the most common form of the emotional bond created from dyadic synchrony characterizing the relationship as mutually responsive and moves beyond a focus on parent or child effects to integrate a family systems view (Debrot et al., 2013; Lindsey et al., 2008; Reyna, Pickler, & Brown, 2012; Tsai, Barnard, Lentz, & Thomas, 2011; Walker-Andrews, Krogh-Jespersen, Mayhew, & Coffield, 2011).

### **Positive consequences**

Rodgers (1989) states that the consequences follow an occurrence of the concept. The positive consequences of emotional synchrony include emotional fusion, emotional attunement, and emotional effervescence. In emotional synchrony, the *emotional fusion* draws the person to feel others, be more sensitive, and empathic. For instance, those who are emotionally fused set aside their choices to achieve harmony with others and within the system. Emotional fusion commonly exists in families, both extended and nuclear, in groups, or pairs (Wiss & Tordjman, 2016). When a higher degree of emotional fusion takes place, a high degree of sensitivity of people will reflect a state of

oneness, we-ness, and togetherness, and to some extent, that they feel alike, think alike, and behave alike (Kunst et al., 2018; Valdesolo & Desteno, 2011). When the emotional fusion takes place, the person does not merely adopt the attitude of those around us but acquires principles thoughtfully, reflectively, and autonomously. *Emotional attunement*, as another positive consequence, refers to a process of sensing the patterns, immersing to the rhythm, and synchronizing connection with others (Lee et al., 2017; Parse, 1987). For instance, when the mother responds and tunes in to the emotional states of an infant (e.g., fear, sadness, excitement), she feels being in-synch and able to communicate accordingly. The feeling of being-in-synch helps the mother to discern what the infant is feeling, doing, and thinking (Feldman & Eidelman, 2004; Jung, 2011; Leclère et al., 2014; Lindsey et al., 2008; Tsai et al., 2011). In a similar context, the person says, “I am really aware of how they are feeling and how I am feeling, and it feels like we are doing something together” (Krejci, 1992, p. 109). *Emotional effervescence* purports relatedness as a critical component of communal relations. The person becomes more focused and more aware of what each other is doing and feeling. The person and others mimic and synchronize their movements, expressions, postures, and with those of another person and, to converge emotionally (Hatfield, Cacioppo, & Rapson, 1993). Such convergence results to a higher degree of receptivity to the feelings of those to whom the person feels connected, and becomes more deeply rooted in communication, shared emotion, thoughts, and actions in a simultaneous mutually coordinating interactive rhythm (Lee et al., 2017; Lindsey et al., 2008). Also, emotional effervescence leads to melodic and rhythmically beautiful self-discovery, sensitivity, and harmony with the cosmos (Brenckick & Webster, 2000), synchrony with life's rules and emotional tranquility (Smith, 1995), self-esteem (Lindsey et al., 2008; Paez et al., 2015), empathy (Adler, 2007; Arizmendi, 2011; Finset & Ørnes, 2017), and well-being (Debrot et al., 2013; Paez et al., 2015; Valdesolo & Desteno, 2011; Zumeta et al., 2016). The person will say, “Moreover, it is at that moment, that..that..something is happening between us...finding the words and creating the mood...when that magic moment occurs sometimes ...we're thinking together..we're talking together, we're...were..feeling something together” Krejci (1992, p. 110).

### **Negative consequences**

When the person and others become emotionally out-of-synch, they will experience an emotional limit—a defense to reduce anxiety from their unresolved emotional challenges. Also, the person tends to avoid sensitive issues, uses silence, withdraws, or diverts conversations to avoid conflict, which could be a reflection of “alteration in synchrony” (Krejci, 1995, p. 29). Rennung and Göritz (2015), Norberg and Athlin (1987), McCollum (2002), Kunst et al. (2018) and James et al. (2010) noted that the chaotic rhythm of the environment, conflicting psychological structures or delineating fluctuation in the sense of ‘I’ and ‘We’, and varying emotional rooms will lead to emotional dyssynchrony (i.e., emotional labor, emotional dissonance, and emotional exhaustion). Notably, *emotional labor* may happen that “requires one to induce or suppress feeling to sustain the outward countenance that produces the proper state of mind in others, in this case, the sense of being cared for in a convivial and safe place” Hochschild (2003, p. 7). In this junction, emotional labor exists when a person cannot express one’s feelings, acting inconsistently with their true feelings, and becoming less authentic. As the person immerses in many situations, the emotional content dictates

how the person reacts by altering the emotional display and expression while feelings remain intact. The frequency of such a situation could be “overused, underappreciated, and susceptible to damage” Hochschild (2003, p. 91). The person may feel “...and sometimes you meet a patient, that you realize, that no matter what you do or say, they don't want to be in synch with you, they don't, they have made up their minds that they want somebody else to take care of them” (Krejci, 1992, p. 111). Another negative consequence, *emotional dissonance* involves incongruent with one right feeling, especially when the experience is a threat to one's identity leading to emotional strain. Any human relations involve high emotional content where the expressed emotion does not always correspond to what the person is experiencing within. Emotional dissonance can happen when the person experiences low confidence in establishing relations, emotional and mental exhaustion, overwhelming situations, or psychological difficulties (Al-Shawaf, Conroy-Beam, Asao, & Buss, 2016; Wiss & Tordjman, 2016). Also, Hochschild (2003) surmised that emotional dissonance causes one to alienate their true feelings, which leads to emotional strain and emotional exhaustion. Hochschild (2003) asked, “What happens when the emotional display that one person owes another reflects a certain inherent inequality?” (p. 19). *Emotional exhaustion* represents the “strain dimension of burnout where the person felt overextended and depleted of one's emotional as well as physical resources” (Helkavaara, 2013, p. 159). Due to the emotional demands and prolonged exposure to stress and burnout, the person develops a feeling of frustration, anxiety, and low morale. For this reason, further disengagement may happen as the person experiences emotional depletion or an escape confronting one's fragility (Debrot et al., 2013; Palagi, 2018; Parse, 1987; Tsai et al., 2011).

### **Refueling emotional synchrony**

In emotional synchrony, the cohesive-enhancing-refueling energy mediates the synchronistic events, balances the emotional content, and regulates the cognitive-emotive-social coincidences to enunciate a communion of beings. The synchrony generated from the soul-felt emotion transcends the boundary of the self to reveal its wholeness to others, affirm others as being in their true sense, and accept each person as irreducible and unique. When a person feels either synchrony or dyssynchrony, emotional energy refuels the body-mind-heart-soul to maintain a state of heightened emotional and mental awareness. As a result, the person and others moving-together-in-time and even in an experience that occurs without being together and sometimes without conscious awareness of its source (Beitman, 2011).

### **DISCUSSION**

Emotion may come from different sources of experience (i.e., self-experience, other-experience, or collective-experience) with the occurrence of synchronistic events, connecting persons, and the collective phenomenon of the human soul. The synchronistic events develop from triadic experiences profess a phenomenon of being-with and being-in-the-world generating meanings and essences. These experiences from the past, present, or future may contribute to a transcendence process on how a person views, acknowledges and accepts others. For instance, in NPR, the person-caring (i.e., nurse) and other-caring (i.e., patient) enter a relationship without ideas about each other. The nurse gets to know the patient through chart reading, during endorsement, or description from other nurses. At first, the nurse feels out-of-sync because of limited



information she has at hand. As the nurse enters the room, there is a feeling of strangeness and inadequacy (James et al., 2010). Also, the patient may feel anxious and avoidant, which can be observed through behaviors, general movement or gait, appearance, facial appearance, verbal reports, or even family behaviors (Krejci, 1992). When the nurse sees a patient, she immediately reflects, "I think it is important getting to know something about the patient's background and their past experiences...really impacts how they are dealing with their current health care? Have they had a nurse? What was that experience like? Was it positive, was it negative? Did they have a terrible hospital stay?" (Krejci, 1992, p. 94). This typical encounter refers to an emerging nursing situation that calls for nurturance perceived in the mind of the nurse as a direct invitation to initiate the relationship to true caring between the nurse and the one nursed (Boykin & Schoenhofer, 2001). Also, this encounter leads to meaningful investigation, discovery, and learning to respond to other's needs acknowledging and affirming the person living to care in unique ways (Boykin & Schoenhofer, 2001). The nurse reflects, "How might I nurse you in ways that are meaningful to you?" or "What truly matters most to you at this moment?" (Boykin & Schoenhofer, 2001). When the nurse continues to imagine and understand the patient, the presence becomes crystal clear and illuminates a rhythmic fusing movement toward a phenomenon of caring integration "in a spirit of being connected in oneness" (Boykin & Schoenhofer, 2001, p. 19). The nurse asks, "How ought I act like a caring person?" (Boykin & Schoenhofer, 2001, p. 4). The nurse becomes emotionally fused and attuned to the patient with a high degree of sensitivity, and understands what the patient is doing, feeling, and thinking. Also, the nurse achieves a sense of connectedness and outflowing compassion, empathy, and love.

On the other hand, a nurse may also encounter a patient who utters, "What am I going to do now—how will I live my life now? I am losing hope! This is my end!" The nurse becomes susceptible to a constraining situation where the patient feels burdened with the uncertainty of current illness, loss and grief, concerns, worries, and despair of the patient (Fridh et al., 2015). These situations reflect the dimensions of patients' most distressing suffering accounted in the study of Fridh et al. (2015). First, the suffering self—an expression of anger, suffering from symptoms, homesickness, discomfort, and uncertainty about the illness. Second, the suffering person in close relations—loss, sorrow, and worry about the family members' situation and their future. Third, the suffering person in a threatening world—worries about social and global concerns. In a similar context, Rowe (2003) described the threats leading to the suffering of the healer (e.g., nurse) such as "reverberation of the past, expectations, vulnerability, the high cost of empathy, inflicting pain, silence, and healer's spiritual or philosophical beliefs" (p. 17). Also, the nurse experiences work-related demands that potentiate an effortful process to alter their outward expression of their true feelings to align with work expectations (Diefendorff & Richard, 2003). From then, the nurse further sinks in severe dissonance, labor, and exhaustion—emotional dyssynchrony, yet still expected to care for many ill patients, families, and themselves simultaneously (Randall & Butler, 2013; Rowe, 2003). In light of this, the nurse responds but feels overwhelmed by the needs of others, which leads to self-protection, detachment, and callousness affecting the embodied relations. Despite the emotional limit leading to dyssynchrony, the nurse will often say, "...you just have to really find some inner resource to be in synch

yourself...it makes it very difficult to pick up the patient's ...feeling at that time” (Krejci, 1992, p. 115). There will always be a refueling of translucent emotional energy to develop a soul-felt connection to various healing stories with a context of struggle, the healing process, and continuing inspiration (Swatton & O'Callaghan, 1999). Also, the nurse remains committed to appreciating more about the self and others as caring, to develop more awareness for growth in reflection, and to immerse fully in caring as a mode of being (Boykin & Schoenhofer, 2001). As a result, the nurse becomes aware of harmony within, becomes enlivened of the importance of harmony with the patient, and learns self-to-self/self-to-other appreciation and communication (Brencick & Webster, 2000).

The *Model of Patterning Emotional Synchrony* offers a new perspective on how the nurse and patient enter mutual relations in a meaningful synchronous experience in the communion of beings, illuminates a soul-felt connectedness through the encounter, presence, and bond. This model further explicates a phenomenon of intricate dance in a triadic-synchronistic rhythm of fusion, attunement, and effervescence. The person and others share emotions in the unfamiliar-familiar pattern, and meaningful coincidences nurturing persons living to care and growing in caring, involve themselves in commitment to know self and others as caring, and as a whole and complete (Boykin & Schoenhofer, 2001). Also, in emotional synchrony, caring becomes the mode of being towards enhanced personhood, growth in reflection, and capacity to care.

## CONCLUSION

Nursing is an interpersonal process but requires a deeper emotive-caring and communion-encounter with a higher degree of emotional synchrony. However, the social, cultural, ethical, economic, legal, and technological demands make it challenging to develop emotional synchrony between nurses and patients. Also, the health system demands nurses to leverage their competence, level of proficiency, and intellectual capacities congruent with the modernization of care as service delivery outcomes. The mechanization of doing nursing remains enmeshed in a fix-it model that focuses on clinical objectivity. As a result, emotional synchrony remains intangible and indefinable.

The Model of Patterning Emotional Synchrony professes to care as a mode of being and views persons as all caring. This emerging concept is a soul-felt connection between the nurse and patient, the soul of the nursing profession, and the essence of the nursing practice. It is with emotional synchrony that will continue to refuel the synergy and transcendence in the communion of beings to embody the concept, *Amo Ergo Sum*, “I love. Therefore, I am.”

Further studies will be conducted for the following inquiries (a) Is emotional synchrony measurable? If so, what are the measures that can be developed? (b) How does emotional synchrony influence the nurse's productivity, well-being, work performance, and professional quality of life? (c) How does emotional synchrony affect a patient's recovery? (d) How does emotional energy mediate emotional synchrony? (e) Is there emotional synchrony between a faculty and student, mentor-mentee, preceptor-

preceptee, or nursing supervisor-nurse? (f) What methodological approach can be used to elicit emotional synchrony?

### CONFLICT OF INTEREST

The authors declare no conflict of interest.

### REFERENCES

- Adler, H. M. (2007). Toward a biopsychosocial understanding of the patient-physician relationship: An emerging dialogue. *Journal of General Internal Medicine*, 22(2), 280-285. doi:10.1007/s11606-006-0037-8
- Al-Shawaf, L., Conroy-Beam, D., Asao, K., & Buss, D. M. (2016). Human emotions: An evolutionary psychological perspective. *Emotion Review*, 8(2), 173-186. doi:10.1177/1754073914565518
- Alligood, M. R. (2014). *Nursing theorists and their work* (8th ed.). St. Louis, Missouri: Elsevier.
- Arizmendi, T. G. (2011). Linking mechanisms: Emotional contagion, empathy, and imagery. *Psychoanalytic Psychology*, 28(3), 405-419. doi:10.1037/a0024176
- Athlin, E., & Norberg, A. (1987). Caregivers' attitudes to and interpretations of the behaviour of severely demented patients during feeding in a patient assignment care system. *International Journal of Nursing Studies*, 24(2), 145-153. doi:10.1016/0020-7489(87)90056-3
- Beitman, B. D. (2011). Coincidence studies. *Psychiatric Annals*, 41, 561-571.
- Benner, P. E., & Wrubel, J. (1989). *The primacy of caring: Stress and coping in health and illness*: Addison-Wesley/Addison Wesley Longman.
- Bernieri, F. J., Reznick, J. S., & Rosenthal, R. (1988). Synchrony, pseudosynchrony, and dissynchrony: Measuring the entrainment process in mother-infant interactions. *Journal of Personality and Social Psychology*, 54(2), 243-253.
- Boykin, A., & Schoenhofer, S. (2001). *Nursing as caring: A model for transforming practice*. New York: National League for Nursing.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. doi:10.1191/1478088706qp063
- Brencick, J. M., & Webster, G. A. (2000). *Philosophy of nursing: A new vision for health care*. Albany, N.Y.: State University of New York Press.
- Butler, E. A., & Randall, A. K. (2013). Emotional coregulation in close relationships. *Emotion Review*, 5(2), 202-210. doi:10.1177/1754073912451630
- Chinn, P. L., & Kramer, M. K. (2008). *Integrated theory and knowledge development in nursing* (7 ed.). St. Louis, MO: Mosby Elsevier.
- Chinn, P. L., & Kramer, M. K. (2015). *Knowledge development in nursing: Theory and process* (9 ed.). St. Louis, Missouri: Elsevier Mosby.
- Chinn, P. L., Maeve, K., M., & Bostick, C. (1997). Aesthetic inquiry and the art of nursing. *Scholarly Inquiry for Nursing Practice*, 11(2), 83-96.
- Debrot, A., Schoebi, D., Perez, M., & Horn, A. B. (2013). Touch as an interpersonal emotion regulation process in couples' daily lives. *Personality and Social Psychology Bulletin*, 39(10), 1373-1385. doi:10.1177/0146167213497592
- Diefendorff, J. M., & Richard, E. M. (2003). Antecedents and consequences of emotional display rule perceptions. *Journal of Applied Psychology*, 88(2), 284-294.

- Ekman, P. (1992). An argument for basic emotions. *Cognition & Emotion*, 6(3-4), 169-200.
- Feldman, R., & Eidelman, A. I. (2004). Parent-infant synchrony and the social-emotional development of triplets. *Developmental Psychology*, 40(6), 1133-1147. doi:10.1037/0012-1649.40.6.1133
- Finset, A., & Ørnes, K. (2017). Empathy in the clinician-patient relationship: The role of reciprocal adjustments and processes of synchrony. *Journal of Patient Experience*, 4(2), 64-68. doi:10.1177/2374373517699271
- Frazer, C., Sullivan, D. H., Weatherspoon, D., & Hussey, L. (2017). Faculty perceptions of online teaching effectiveness and indicators of quality. *Nursing Research and Practice*, 2017. doi:10.1155/2017/9374189
- Fridh, I., Kenne Sarenmalm, E., Falk, K., Henoch, I., Öhlén, J., Ozanne, A., & Jakobsson Ung, E. (2015). Extensive human suffering: A point prevalence survey of patients' most distressing concerns during inpatient care. *Scandinavian Journal of Caring Sciences*, 29(3), 444-453. doi:10.1111/scs.12148
- Gendron, M., & Barrett, L. F. (2018). Emotion perception as conceptual synchrony. *Emotion Review*, 10(2), 101-110. doi:10.1177/1754073917705717
- Hagerty, B. M., Lynch-Sauer, J., Patusky, K. L., & Bouwsema, M. (1993). An emerging theory of human relatedness. *Journal of Nursing Scholarship*, 25(4), 291-296.
- Hagerty, B. M., & Patusky, K. L. (2003). Reconceptualizing the nurse-patient relationship. *Journal of Nursing Scholarship*, 35(2), 145-150.
- Hartrick, G. (1997). Relational capacity: The foundation for interpersonal nursing practice. *Journal of Advanced Nursing*, 26(3), 523-528.
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). Emotional contagion. *Current Directions in Psychological Science*, 2(3), 96-100.
- Helkavaara, M. (2013). Emotional exhaustion and psychosocial work factors. In S. Bährer-Kohler (Ed.), *Burnout for experts: Prevention in the context of living and working* (pp. 159-168). Boston, MA: Springer.
- Hochschild, A. R. (2003). *The managed heart - commercialization of human feeling, twentieth anniversary edition, with a new afterword*. Berkeley, Los Angeles: University of California Press.
- Humphrey, R. H., Burch, G. F., & Adams, L. L. (2016). The benefits of merging leadership research and emotions research. *Frontiers in Psychology*, 7. doi:10.3389/fpsyg.2016.01022
- James, I., Andershed, B., Gustavsson, B., & Ternstedt, B.-M. (2010). Emotional knowing in nursing practice: In the encounter between life and death. *International Journal of Qualitative Studies on Health and Well-being*, 5(2), 5367. doi:10.3402/qhw.v5i2.5367
- Jung, C. G. (1973). *Synchronicity: An acausal connecting principle* (R. F. C. Hull, Trans.). Princeton, NJ: Princeton University Press.
- Jung, J. (2011). Caregivers' playfulness and infants' emotional stress during transitional time. *Early Child Development and Care*, 181(10), 1397-1407. doi:10.1080/03004430.2010.532873
- Kimura, M., & Daibo, I. (2006). Interactional synchrony in conversations about emotional episodes: A measurement by "the between-participants pseudosynchrony experimental paradigm". *Journal of Nonverbal Behavior*, (3), 115-126. doi:10.1007/s10919-006-0011-5

- Koudenburg, N., Postmes, T., & Gordijn, E. H. (2017). Beyond content of conversation. *Personality and Social Psychology Review*, 21(1), 50-71. doi:10.1177/1088868315626022
- Krejci, J. W. (1992). *An exploration of synchrony in nursing*. Ph.D. The University of Wisconsin - Milwaukee. Ann Arbor. Retrieved from <https://www.proquest.com/>
- Krejci, J. W. (1995). Synchronous connections: Nursing's little secret. *Journal of Nursing Care Quality*, 9(4), 24-30.
- Kuhn, S., Muller, B. C. N., van der Leij, A., Ap, D., Brass, M., & van Baaren, R. B. (2011). Neural correlates of emotional synchrony. *Social Cognitive and Affective Neuroscience*, 6(3), 368-374. doi:10.1093/scan/nsq044
- Kunst, J. R., Boos, B., Kimel, S. Y., Obaidi, M., Shani, M., & Thomsen, L. (2018). Engaging in extreme activism in support of others' political struggles: The role of politically motivated fusion with out-groups.(research article). *PloS One*, 13(1), e0190639. doi:10.1371/journal.pone.0190639
- Lawson, T. T. (2008). *Carl Jung, Darwin of the mind*. London: Karnac Books.
- Leclère, C., Viaux, S., Avril, M., Achard, C., Chetouani, M., Missonnier, S., & Cohen, D. (2014). Why synchrony matters during mother-child interactions: A systematic review. *PloS One*, 9(12). doi:10.1371/journal.pone.0113571
- Lee, T.-H., Miernicki, M. E., & Telzer, E. H. (2017). Families that fire together smile together: Resting state connectome similarity and daily emotional synchrony in parent-child dyads. *Neuroimage*, 152, 31-37. doi:10.1016/j.neuroimage.2017.02.078
- Leininger, M. M. (1988). *Care: The essence of nursing and health*. Detroit: Wayne State University Press.
- Lindsey, E. W., Colwell, M. J., Frabutt, J. M., Chambers, J. C., & MacKinnon-Lewis, C. (2008). Mother-child dyadic synchrony in European American and African American families during early adolescence: Relations with self-esteem and prosocial behavior. *Merrill-Palmer Quarterly*, 54(3), 289-315.
- McCarthy, M., Fergus, K., & Miller, D. (2016). 'I-we' boundary fluctuations in couple adjustment to rectal cancer and life with a permanent colostomy. *Health Psychology Open*, 3(1), 1-14. doi:10.1177/2055102916633582
- McCollum, C. (2002). Relatedness and self-definition: Two dominant themes in middle-class Americans' life stories. *Ethos*, 30(1/2), 113-139. doi:10.1525/eth.2002.30.1-2.113
- Merriam-Webster Dictionary. (2018). "Synchrony, n.". Retrieved from <https://www.merriam-webster.com/dictionary/synchronicity>
- Morley, J., Holman, N., & Murray, C. D. (2017). Dressing changes in a burn unit for children under the age of five: A qualitative study of mothers' experiences. *Burns*, 43(4), 757-765. doi:10.1016/j.burns.2016.11.015
- Newman, M. A. (1997). Evolution of the theory of health as expanding consciousness. *Nursing Science Quarterly*, 10(1), 22-25.
- Norberg, A., & Athlin, E. (1987). The interaction between the parkinsonian patient and his caregiver during feeding: A theoretical model. *Journal of Advanced Nursing*, 12(5), 545-550. doi:10.1111/j.1365-2648.1987.tb03043.x
- Norris, C. M. (1982). *Concept clarification in nursing*. Rockville, MD: Aspen.
- Orlando, I. (1961). *The dynamic nurse-patient relationship function, process, and principles*. New York: National League for Nursing.

- Paez, D., Rime, B., Basabe, N., Wlodarczyk, A., & Zumeta, L. (2015). Psychosocial effects of perceived emotional synchrony in collective gatherings. *Journal of Personality and Social Psychology, 108*(5), 711-729. doi:10.1037/pspi0000014
- Palagi, E. (2018). Not just for fun! Social play as a springboard for adult social competence in human and non-human primates. *Behavioral Ecology and Sociobiology, 72*(6), 1-14. doi:10.1007/s00265-018-2506-6
- Parse, R. P. (1987). *Nursing science: Major paradigms, theories, and critiques*. Philadelphia: Saunders.
- Peplau, H. (1988). *Interpersonal relations in nursing* (2 ed.). London, UK: MacMillan Education Ltd.
- Quinn, J. F. (1989). Healing: The emergence of right relationship. In R. Carlson & B. Shield (Eds.), *Healers on healing*. (pp. 139-144). Los Angeles: JP Tarcher.
- Randall, A. K., & Butler, E. A. (2013). Attachment and emotion transmission within romantic relationships: Merging intrapersonal and interpersonal perspectives. *Journal of Relationships Research, 4*, e10, 1-10. doi:10.1017/jrr.2013.10
- Rennung, M., & Göritz, A. S. (2015). Facing sorrow as a group unites. Facing sorrow in a group divides. *PloS One, 10*(9). doi:10.1371/journal.pone.0136750
- Reyna, B., Pickler, R. H., & Brown, L. F. (2012). Mother-infant synchrony during preterm infant feeding. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 41*, S149. doi:10.1111/j.1552-6909.2012.01362\_43.x
- Rodgers, B. L. (1989). Concepts, analysis and the development of nursing knowledge: The evolutionary cycle. *Journal of Advanced Nursing, 14*, 330-335.
- Rodgers, B. L. (2000). Concept analysis: An evolutionary view. In B. L. Rodgers & K. A. Knafl (Eds.), *Concept development in nursing: Foundations, techniques, and applications* (pp. 77-102). Philadelphia, PA: WB Saunders Company.
- Rogers, M. E. (1970). Introduction to the theoretical basis of nursing. *Nursing Research, 19*(6), 541.
- Rowe, J. (2003). The suffering of the healer. *Nursing Forum, 38*(4), 16-20.
- Schimmack, U., Oishi, S., & Diener, E. (2002). Cultural influences on the relation between pleasant emotions and unpleasant emotions: Asian dialectic philosophies or individualism-collectivism? *Cognition & Emotion, 16*(6), 705-719.
- Smith, C. A. (1995). The lived experience of staying healthy in rural African-American families. *Nursing Science Quarterly, 8*(1), 17-21. doi:10.1177/089431849500800106
- Stieler, M., & Germelmann, C. C. (2016). The ties that bind us: Feelings of social connectedness in socio-emotional experiences. *The Journal of Consumer Marketing, 33*(6), 397-407.
- Swatton, S., & O'Callaghan, J. (1999). The experience of 'healing stories' in the life narrative: A grounded theory. *Counselling Psychology Quarterly, 12*(4), 413-429.
- Tarnow, K. G., & Butcher, H. K. (2005). Annual review of nursing education : Strategies for teaching, assessment, and program planning. In K. Heinrich & M. H. Oermann (Eds.), *Annual review of nursing education* (Vol. 3). New York: Springer Publishing Company.
- Tsai, S.-Y., Barnard, K. E., Lentz, M. J., & Thomas, K. A. (2011). Mother-infant activity synchrony as a correlate of the emergence of circadian rhythm. *Biological Research for Nursing, 13*(1), 80-88. doi:10.1177/1099800410378889

- Valdesolo, P., & Desteno, D. (2011). Synchrony and the social tuning of compassion. *Emotion, 11*(2), 262-266. doi:10.1037/a0021302
- Wagner, U., Galli, L., Schott, B. H., Wold, A., van der Schalk, J., Manstead, A. S. R., . . . Walter, H. (2015). Beautiful friendship: Social sharing of emotions improves subjective feelings and activates the neural reward circuitry. *Social Cognitive and Affective Neuroscience, 10*(6), 801-808. doi:10.1093/scan/nsu121
- Walker-Andrews, A. S., Krogh-Jespersen, S., Mayhew, E. M. Y., & Coffield, C. N. (2011). Young infants' generalization of emotional expressions: Effects of familiarity. *Emotion, 11*(4), 842-851. doi:10.1037/a0024435
- Walker, C. J. (2010). Experiencing flow: Is doing it together better than doing it alone? *The Journal of Positive Psychology, 5*(1), 3-11. doi:10.1080/17439760903271116
- Watson, J. (1985). *Nursing: Human science and human care. A theory of nursing*. Norwalk, CT: Appleton-century-crofts.
- Whall, A. (1981). Nursing theory and the assessment of families. *Journal of Psychiatric Nursing and Mental Health Services, 19*(1), 30-36.
- Williams, L. A., & Bliss-Moreau, E. (2016). Humans are ultrasocial and emotional. *Behavioral and Brain Sciences, 39*, 60. doi:10.1017/S0140525X15001211
- Wiss, M., & Tordjman, S. (2016). Creating a 'social zeitgeber' to synchronize family emotional rhythms: A new therapeutic approach in child and adolescent psychiatry. *Journal of Physiology - Paris, 110*(4), 480-486. doi:10.1016/j.jphysparis.2017.07.001
- Zumeta, L. N., Oriol, X., Telletxea, S., Amutio, A., & Basabe, N. (2016). Collective efficacy in sports and physical activities: Perceived emotional synchrony and shared flow. *Frontiers in Psychology, 6*. doi:10.3389/fpsyg.2015.01960

**Appendix***Table 1. Conceptual Components of Emotional Synchrony based on Consensual Validation of the Researchers\**

Literature	Antecedents		Defining Attributes			Positive			Negative		
	Definition	Experiences I-You-We	Encounter	Presence	Bond	Fusion	Attunement	Effervescence	Dissonance	Labor	Exhaustion
Adler (2007)			√	√			√				
Al-Shawaf et al. (2016)								√	√	√	
Arizmendi (2011)								√			
Brencick and Webster (2000)		√									
Butler and Randall (2013)								√			
Chinn and Kramer (2015)	√										
Debrot et al. (2013)		√	√	√	√						√
Ekman (1992)			√	√	√						
Feldman and Eidelman (2004)		√	√	√							
Finset and Ørnes (2017)		√					√		√	√	
Frazer et al. (2017)	√					√	√	√			
Fridh et al. (2015)	√	√	√	√		√	√	√			
Gendron and Barrett (2018)	√										
Hagerty et al. (1993)								√	√	√	
Hartrick (1997)		√	√	√				√			
Helkavaara (2013)											√
Hochschild (2003)						√	√			√	
Humphrey et al. (2016)		√	√	√		√	√				
James et al. (2010)	√										
Jung (2011)						√					
Kimura and Daibo (2006)											
Koudenburg et al. (2017)		√				√	√	√			
Kuhn et al. (2011)						√	√				
Kunst et al. (2018)		√									
Leclère et al. (2014)	√										
Lee et al. (2017)				√							
Lindsey et al. (2008)			√	√	√		√				
McCarthy et al. (2016)							√	√			
McCollum (2002)		√				√	√	√			
Morley et al. (2017)	√					√	√	√			
Norberg and Athlin (1987)							√				
Paez et al. (2015)								√		√	
Palagi (2018)		√	√	√							√
Parse (1987)		√	√		√				√	√	√
Quinn (1989)		√			√		√				
Randall and Butler (2013)						√	√	√			
Rennung and Göritz (2015)							√				
Reyna et al. (2012)		√				√	√				
Rogers (1970)						√	√	√		√	
Schimmack et al. (2002)			√	√	√						
Smith (1995)	√										
Stieler and Germelmann (2016)		√	√	√	√			√			
Swatton and O'Callaghan (1999)											
Tsai et al. (2011)		√	√			√	√	√	√	√	√



Literature	Definition	Antecedents			Defining Attributes			Positive			Negative	
		Experiences I-You-We	Encounter	Presence	Bond	Fusion	Attunement	Effervescence	Dissonance	Labor	Exhaustion	
Valdesolo and Desteno (2011)	√											
Wagner et al. (2015)					√							
Walker (2010)					√							
Walker-Andrews et al. (2011)					√							
Whall (1981)	√				√							
Williams and Bliss-Moreau (2016)								√				
Wiss and Tordjman (2016)				√					√			
Zumeta, Oriol, Telletxea, Amutio, and Basabe (2016)		√	√					√				

\*CPT/MDR/MGN/MGR

## **Interprofessional Education (IPE) in Developing Countries: Challenges and Lesson Learnt from its Implementation in the United Kingdom: A Systematic Review**

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### **ABSTRACT**

**Background:** Evidence of effectiveness of the Interprofessional Education (IPE) in improving collaboration practice, patient and family satisfaction, and patient outcomes had been widely published. Most developed countries, including the United Kingdom, have implemented IPE in their healthcare curriculum, whereas some developing countries are starting the IPE initiative program.

**Purpose:** This study aims to examine the challenges of implementing IPE.

**Methods:** Primary studies to be included in this systematic review were searched from electronic databases such as MEDLINE (OVID) 1996, CINAHL, and ERIC (EBSCO). Hand searching through the journal of interprofessional care was also conducted. The included studies were critically appraised using the JBI QARI appraisal tool. The findings of the included studies were extracted using JBI finding extraction form and appraised based on the JBI level of credibility. The analysis of the study was presented in narrative form.

**Results:** This review produced five qualitative studies using focus groups and interview methods. A total of 5 out of 88 papers met the inclusion criteria included in this systematic review. Three synthesis findings of the challenges in implementing IPE and possible solutions were identified in the literature: inter-professional relationship, IPE curriculum, and administration, and resources.

**Conclusions:** The evidence of implementing IPE in developing countries is limited. However, the challenges in implementing IPE in developing countries remain similar to those faced by developed countries. This can be a guide for developing countries to plan, initiate, and implement IPE. Future studies about the implementation of IPE in developing countries are highly recommended.

**Keywords:** Inter-professional education; challenges; developing countries

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## **BACKGROUND**

In the current global era, healthcare professionals face an increasing number of health problems and patients' health needs. The collaborative practice among healthcare professionals is required to overcome these problems and improve the quality of health services. According to the Canadian Interprofessional Health Collaborative (2010), collaboration occurs when healthcare professionals work together with colleagues, other professions, patients, and their families. After nearly 50 years of research, there is sufficient evidence to show that effective collaborative practices are optimizing health care services, strengthening healthcare systems, and improving health outcomes (Institute of Medicine [IOM], 2015). Collaborative practices can also reduce the number of complications, length of hospitalization, conflicts between healthcare teams, and mortality rates (Frenk et al., 2010). The absence of good collaboration among health workers will have a negative impact on patient outcomes, resource wastage, and decreased job satisfaction (Freeth, 2001).

Communication skills, as a part of collaboration practice, also play an important role in producing quality care (D'amour & Oandasan, 2005). One of the communication problems that can be found in clinical practice is the job overlapping in the inter-professional team caused by ineffective communication among the team members, which subsequently affects the patient outcome (Frenk et al., 2010). The joint commission (JCAHO) reported that 63 percent or nearly two-thirds of the incidences of medical errors conducted by health professionals were caused by poor communication (D'amour & Oandasan, 2005). These findings show how important the implementation of collaboration among health workers to improve the quality of health services is. However, the practice of collaboration does not occur easily as it requires a process to get health workers to work in teams and communicate effectively.

Education is the key to develop and change the methods and quality of health services (Steinert, Janny, Rocky, & Leins, 2005). The first Institute of Medicine (IOM) conference recommended that all health education providers be obliged to encourage cooperation between different health professions within the health care team (IOM, 1972). Inter-professional education (IPE), where students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes (WHO, 2010), provides an opportunity for health students to engage in interactive learning with other health professional students so that when they enter the workforce, they have the knowledge, skills, and confidence to work in teams that impact on better patient care (IOM, 2015). Shared learning experiences with various health professions can prevent barriers between them and change their attitudes into more respect for other professions (Hammick, Freeth, Koppel, Reeves, & Barr, 2007). IPE is an effective strategy for students to develop their clinical knowledge and skills, change attitudes, and increase their interest in patient care (WHO, 2010). The application of IPE is not limited to the field of health care. There are some disciplines that integrate IPE into the academic curriculum. A large Midwestern United States (US) university established an IPE program for an early childhood education program and a school counseling program (Dobbs-Oates & Morris, 2016). The IPE program included an experimental practice in a public school where the students of both programmes worked collaboratively to develop an academic plan and decide the functional need for children

with a disability. Another field that integrates IPE into the academic curriculum is communication sciences faculty in the US (Goldberg, 2015).

Some systematic reviews report positive results in the application of inter-professional education, such as improving collaboration skills, increasing clinical and medical knowledge, reducing the incidence of medical errors in patient management, and ultimately improving patient satisfaction (Hammick et al., 2007; Revees et al., 2010; Lapkin, Levett-Jones, & Gilligan, 2013). The integration of inter-professional education into the health education curriculum is also effective in changing the knowledge, attitudes, and interests of health students on other health professions so that they are more able to respect other professional associates (Steinert et al., 2005). Moreover, it increases their awareness to communicate and work in teams effectively, resulting in better patient outcomes. Therefore, based on the reports of IPE effectiveness and the demands of collaborative practice among health practitioners, World Health Organisation strongly recommends the transformative health education to include IPE in its curricula (WHO, 2010).

IPE has been implemented for many years, mostly in developed countries (Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013). One developed country that already has an established IPE program is the United Kingdom (UK). For the developing of inter-professional education program, United Kingdom governments have allocated substantial funding and have adopted a clear regulation to integrate inter-professional education into health professional education (Barnsteiner et al., 2007). Now, inter-professional education is a mandatory requirement for pre-registration training in health and social care in the UK (Lapkin et al., 2013).

Almost all of the latest evidence on IPE implementation comes from developed countries (Reeves et al., 2013). The evidence available from developing countries is limited (Lapkin et al., 2013). Some developing countries such as Qatar, Japan, Egypt, Philippines, India, Indonesia, and Thailand have been applied IPE in their curriculum; however, the implementation is not full IPE (Barr, 2016). Some of them only include IPE in their extra-curriculum activities, and some countries still develop an IPE initiative program (El-Awaisi, 2017). The lack of IPE evidence requires the establishment of IPE programs in developing countries based on assumptions and tools derived from developed countries. Lessons learned from challenges and constraints faced in planning, initiating, and implementing IPE in developed countries are essential to encourage the adoption of IPE globally and assist in the implementation of IPE programs in developing countries (Reeves et al., 2013). Therefore, this systematic review is important to be conducted in order to contribute knowledge about challenges in the implementation of IPE in both developed and developing countries.

## **PURPOSE**

This study aims to examine the challenges in implementing IPE

## METHODS

### Research design

This study used a systematic review as the study methodology to answer the research question of: “What are the challenges in implementing inter-professional education in developing countries?” The studies included in this review are primary research in a qualitative design that evaluate the planning, initiating, or implementing an IPE program. These studies include interviews, focus groups, and other methods of qualitative research. This review considered the population of interest, which includes students, staff, and faculty members of health and social care programs in the United Kingdom and developing countries. The exclusion criteria of this systematic review are studies that did not concern in planning or implementation of IPE, research on IPE outside of the health care field, and non-primary studies including reviews, commentaries, opinion articles, and editorials. Studies conducted before the year 2008 and presented in non-English languages will also be excluded. The studies were restricted to the last ten years (2008-2017) due to the initiative of IPE in developing countries, which began in 2007 (Barr, 2016).

### Search strategy

The search strategy found both published and unpublished studies that are limited to the English language and full texts only. Electronic databases such as MEDLINE (OVID) 1996, CINAHL, and ERIC (EBSCO) were searched using several combinations of terms to identify any relevant studies (Table.1). Hand search to find the relevant unpublished studies through the Journal of Inter-professional care was also conducted, but it resulted in similar articles as those found in MEDLINE. Titles and abstracts of the studies resulted from the search were assessed based on the inclusion criteria.

*Table 1. The search strategy of the review*

Search Number	Search Terms	Results	
ERIC (EBSCO)			
1.	Inter-professional AND education	3402	
2.	Inter-professional AND learning	991	
3.	1 OR 2	3493	
4.	3 AND Health education	409	
5.	Limiters- Full text; date published; 20080101-20171231	57	
MEDLINE			
1.	Inter-professional	Exp inter-professional relation	44453
2.		Exp patient care team	41855
3.		2 or 3	92450
4.	Education	Education\$ OR Learn\$	5326
5.		Exp education	20348
6.		4 OR 5	19804
7.		3 AND 6	2089
8.	Students	Exp Student	43890
9.		7 AND 8	754
10.		Limiters- Full text; date published; 2008-2017	31

### **Data extraction**

The data extraction tool used in this review is JBI-QARI (Joanna Briggs Institute Qualitative Assessment and Review Instrument) (Emily, 2008). This tool is used to collect information regarding the participants, methods, methodology, geographic locations, settings, cultural contexts, data analyses, and the authors' conclusions of the studies. This systematic review uses the critical appraisal tool of JBI QARI, which consists of ten criteria. It has been selected rather than the other critical appraisal tools because every question item on this checklist is presented very clearly and includes all the information needed to assess the quality of a study, including the nature and appropriateness of the methodological approach, specific methods and the representation of the voices or meanings of study participants (Emily, 2008).

### **Data analysis**

A meta-synthesis was undertaken for the included papers according to the framework provided by JBI. Findings from qualitative research were collected using JBI QARI. The findings were collected according to their level of credibility (Level 1 findings) in keeping with the JBI criteria. The findings were then categorised by the similarity of meaning (Level 2 findings). These Level 2 findings were then subjected to meta-synthesis resulting in a series of synthesised findings that can be used as a basis or recommendation in evidence-based practice (level 3 findings). If textual pooling is not possible, then the findings will be presented in a narrative form.

## **RESULTS**

The search strategy resulted in 88 potentially relevant papers to be examined. After examining the abstracts, 12 studies were selected. A more detailed examination was conducted to determine the relevant papers that meet the inclusion criteria, and 5 papers were left to be included in this systematic review: 4 papers from the UK and 1 paper from a developing country (Egypt). The process can be found in Figure 1.

A meta-synthesis was undertaken for the five included papers (Anderson & Lennox, 2009; Fook et al., 2013; Forte & Fowler, 2009; Hosny, Kamel, El-Wazir, & Gilbert, 2013) according to the framework provided by JBI. A total of twenty findings (Level 1) and their illustrations were drawn from the qualitative studies, and each finding was assigned a level of credibility in keeping with the JBI criteria. The findings were then identified, matching the objectives of this systematic review to produce nine categories (Level 2) according to the similarity of the findings in meaning. The nine categories were then treated to a meta-synthesis in order to produce three synthesised findings (Level 3) that could potentially be used as a basis for evidence-based practice relating to the initiative and implementation of inter-professional education. The three synthesized findings were: inter-professional relationships, IPE curriculum, and administration, and resources (Table 2).

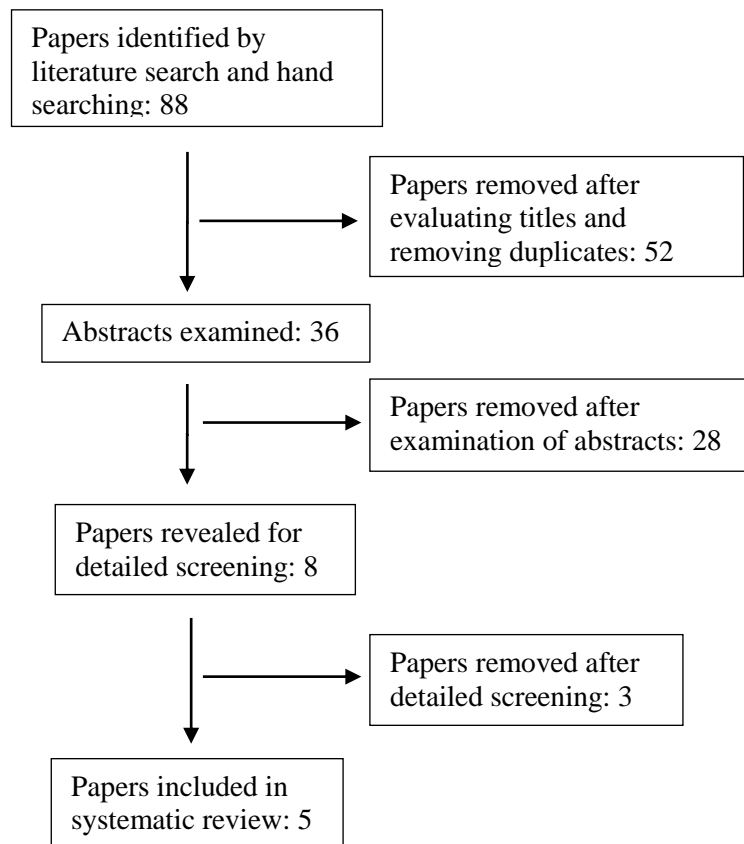


Figure 1. Retrieval process in the study

Table 2 presents the three synthesized findings of the study, including inter-professional relationships, IPE curriculum, and administration and resources.

Table 2. Categories of synthesized findings

Synthesized Findings (Level 3)	Categories (Level 2)	Findings (Level 1)
1. Inter-professional relationship	Teamwork	<ul style="list-style-type: none"> <li>- No collaboration</li> <li>- Engage in</li> <li>- Professional domination</li> </ul>
	Different perception and understanding of IPE	<ul style="list-style-type: none"> <li>- IPE is unimportant</li> <li>- IPE is about collaboration</li> <li>- Enjoyable activity</li> </ul>
2. IPE curriculum	Scheduling	<ul style="list-style-type: none"> <li>- Hectic timetables</li> <li>- Different academic calendars</li> </ul>
	Material content	<ul style="list-style-type: none"> <li>- Professions' terminologies</li> <li>- different thought process</li> </ul>
	Teaching and Learning approach	<ul style="list-style-type: none"> <li>- learning styles</li> <li>- separate lecture versus student group</li> <li>- small groups</li> </ul>

Synthesized Findings (Level 3)	Categories (Level 2)	Findings (Level 1)
3. Administration and resources	IPE planning	- Lack of central planning
	Leadership	- Strong commitment - Enjoyment - Contribution of all staff
	Faculty resources	- Lack of administrative staff - Lack of competent facilitators
	IPE evaluation	- Listening to students feedback

## DISCUSSION

### Inter-professional relationship

Inter-professional learning requires students from different professions learning and working together in a team (Rotz & Duenas, 2016). The diversity within student groups in age, life experience, attitude to learning, expectation, and tolerance of differences, influences the relationship between student groups and has the potential to cause conflict (Altin, Tebest, Kautz-Freimuth, Redaelli, & Stock, 2014). In line with this statement, this systematic review has found that developing a good relationship in which students can learn and work collaboratively in a team was challenging. Students were perceived to be unconfident to work with other profession groups, especially in group presentations (Anderson & Lennox, 2009), and they did not really work together in practice (Forte & Fowler, 2009). This inhibits the achievement of the IPE goal of creating collaborative practices (Altin et al., 2014). This problem is also found in a study by Coaster (2008), which has reported the low level of student contact with other professional groups within the interprofessional learning approach.

Interpersonal capabilities are suggested to be an important factor that influences students' willingness and openness to engage with other professions (Croker, Fisher, & Smith, 2015). These capabilities are included giving and receiving respect to other professions, being interested in other professions, developing interpersonal bonds to facilitate interprofessional interactions, being inclusive of other professions, and bringing a sense of own profession to interprofessional interactions (Morison, Boohan, Jenkins, & Moutray, 2003).

Another factor that encourages the synergetic interactions between students from different professions is a balance of professions during interactions (Thurston, Chesson, Harris, & Ryan, 2017). The unbalanced proportion of students from the variety of disciplines involved in an IPE session will create a sense of professional domination, which can create a gap between professional students (Thurston et al., 2017). This strengthens the finding in this review that some students felt unconfident in a group presentation dominated by medical students (Anderson & Lennox, 2009).

Student readiness for interprofessional education may have a significant impact on students to be involved in collaborative learning. A study conducted by Grice and Mccorkle (2016) has identified the readiness of healthcare students for interprofessional learning that showed significant differences in outcomes among professions. Results indicate that the teamwork and collaboration index of medical students is lower than



that of pharmacists, nurses, and other health professional students (Grice & Mccorkle, 2016). This finding suggests that medical students are less appreciative of teamwork and considers that collaborative learning has no significant impact on their ability to understand clinical problems. It can be a barrier to IPE learning.

Students' perception also influences the interprofessional learning process, including perception towards the other professions and perception towards IPE (Fook et al., 2013). A study from Zeeni et al. (2016) found that there is a positive correlation between students' perceptions towards the other professions and the readiness to work in an interprofessional team. It means that students who have a good perception and know about the role of other professions involved in interprofessional learning will show a positive attitude in teamwork, and this can create a harmonious interprofessional working group (Zeeni et al., 2016). However, this systematic review found that some students felt that medical is a superior profession and decision-maker in practice, while the other professions only follow their instructions (Forte & Fowler, 2009). It suggests that the students do not have a positive perception and understanding about the roles and responsibilities of each profession in healthcare teams. It is important that students identify and eliminate the wrong perceptions and stereotypes of other professions so that they can develop an effective collaboration on interprofessional teams (Hammick et al., 2007). Professional stereotypes that emerged during interprofessional learning may impede the ability of a team to work together and prevent effective communication between professional students (Thurston et al., 2017). This could be a barrier to implementing the IPE course. These problems can be prevented by creating collaborative learning among health professional students at the very beginning of their education (Hosny et al., 2013). This is supported by Barr (2016) that the introduction of IPE at the beginning of the academic level will prevent professional stereotypes and enhance the collaboration practice among healthcare students.

Staff members also have the same problem as the students regarding professional stereotypes (Bridges, Davidson, Odegard, Maki, & Tomkowiak, 2011). Barr (2016) suggested that the preferences of IPE facilitators towards their own professions can disrupt the learning process for students from other professions. For instance, in this review, it was found that some professions perceived that the medical profession is dominant in other professions (Anderson & Lennox, 2009; Fook et al., 2013). This results in a tendency to pay attention and reward students on their own professions greater than for other professional students (Wilby et al., 2015). It does not indicate healthy interprofessional teamwork because it has the potential to build an inter-professional gap that will ultimately impede collaboration and teamwork in implementing IPE (Altin et al., 2014). It will be more complicated when such professional stereotypical attitudes are transferred to their students, which can create conflicts and tensions among faculty members and students (Altin et al., 2014). To prevent this problem, at the beginning of the programme, faculty staff need to be equipped with knowledge about IPE, for example, by holding an IPE seminar (Barr, 2016). According to Bridges et al. (2011), staff and facilitators should have sufficient knowledge of the importance of IPE and the positive impact of collaborative practice. Thus, they will be motivated to cooperate in achieving the success of the IPE programme.

## **Curriculum**

Curriculum development is one of the challenging parts of the process implementation of IPE (Anderson & Lennox, 2009; Fook et al., 2013; Hosny et al., 2013). Some problems regarding the teaching approach, material content, and scheduling have arisen as the consequence of different programme activities and student characteristics involved in interprofessional learning (Crocker et al., 2015). Students may have different basic knowledge, learning needs, and learning styles.

Learning styles are student's preference toward a method of receiving information or skills from learning resources (Coffield, Moseley, Hall, & Ecclestone, 2004). The use of learning styles in accordance with the preference of students will facilitate the learning process resulting in a good outcome (D'Andrea, 2007). Therefore, the facilitator needs to identify the learning styles of the students in order to use appropriate teaching methods. This is a big challenge for the facilitator to determine the proper teaching method which can accommodate the learning style of the students in an interprofessional class. In terms of healthcare students, each of them has different practice approaches commonly used in their courses (Forte & Fowler, 2009). For example, doctors and nurses may have different approaches to the practice of patient care. Combining students of these two professions in a similar learning environment without considering their differences can be an obstacle in the process of interprofessional learning (Reeves, Goldman, & Oandasan, 2007). If this discrepancy is not addressed early on, it will provide a poor learning experience for students (Rotz & Duenas, 2016). In this condition, the role of faculty leader will be very important, especially in conducting regular meetings among IPE facilitators from different professions, giving the opportunity to share and evaluate interprofessional teaching approach within their wider interprofessional curricula (Reeves et al., 2007). Not less important, the faculty leader who provides opportunities for lecturers to attend training can improve their knowledge and skills in delivering an interprofessional course and create an interactive learning approach (Thurston et al., 2017).

Developing material content to be provided to students is also part of the curriculum preparation. The preparation of the material should consider the diversity of the disciplines (VanKuiken, Schaefer, & Hall, 2016). Choosing a theme that involves the role of the entire professions will foster collaborative practice within an interprofessional team (Reeves et al., 2007). For example, the selection of themes in management for patients with diabetes mellitus in pregnancy. This theme may include the professional roles of doctors, nurses, midwives, pharmacists, and nutritionists so that each profession can take a role according to its discipline (VanKuiken et al., 2016). The preparation of educational materials should use appropriate terminology for all professional groups. The use of specific phrases in certain disciplinary groups makes it difficult for other professional students to understand the material (Anderson & Lennox, 2009). This can be a barrier to the delivery of IPE courses.

The most common problem in preparing the IPE curriculum is scheduling (Anderson & Lennox, 2009; Forte & Fowler, 2009; El-Awaisi., 2017). Every program has its own activities and the academic calendar, and sometimes it is difficult to find availability timetabling that can accommodate all professional students to attend the IPE sessions

(Anderson & Lennox, 2009). This is reinforced by a statement from (VanKuiken et al., 2016) that finding a consistent schedule that can accommodate all students from various health professions can be one of the biggest obstacles in the implementation of the IPE program. Multiple lobbying between departments may be required to determine the date of the IPE session, and it is important to appoint one of the staff responsible for ensuring mutually agreed dates (Dobbs-Oates & Morris, 2016).

### **Administration and Resources**

It has been agreed that IPE is a complex program (Altin et al., 2016). It is not easy to organize interprofessional education, especially when faced with some administrative or logistical obstacles. The administrative barriers, that arise in the management of IPE programmes, call them as internal inhibitors (unequal numbers of student groups, campus distance, and different academic calendars) and external inhibitors (program accreditation, funds) (Rotz & Duenas, 2016). All stakeholders should coordinate to discuss these factors before starting the IPE programme (Thurston et al., 2017).

A study by Fook et al. (2013) showed that faculty members were frustrated as they have more workload, and at the beginning of the programme there is no clear distribution of jobs among the staff. This condition leads to a decrease in staff performance and impact on poor programme management. Therefore it is important to arrange some specific tasks and decide the right person to be involved in the programme (Altin et al., 2016).

Oandasan and Reeves (2005), in their study, suggested that planning is an important part of an IPE initiative. How an institution plans the IPE programme will influence the success of the programme. However, this modified systematic review found that some institutions faced some obstacles in the application of IPE because of the lack of central planning. Fook et al. (2013) showed that faculty members were frustrated as they have more workload, and at the beginning of the programme there is no clear distribution of jobs among the staff. This condition leads to a decrease in staff performance and impact on poor programme management. Therefore it is important to arrange some specific tasks and decide the right person to be involved in the programme (Altin et al., 2016). According to Altin et al. (2014), there are some issues that need to be taken into account in the planning of IPE initiatives, such as what drivers influencing the programme, who will be involved, what are the potential barriers and how to overcome, what teaching method used to achieve the goal, how to evaluate the activities, and how to sustain the programme. Careful planning is the first step that will lead to the success of a programme (Barr, 2016).

The lack of human resources including administrative staff and competent facilitators to support IPE was also found to be a major barrier in implementing IPE (Fook et al., 2013; Hosny et al., 2013). Expertise administrative staff are needed to organise the complex IPE sessions, including timetabling and placement (Hosny et al., 2013). In some cases, they should take additional responsibilities because of the over workload of the programme (Barr, 2016). Therefore, the lack of administrative staff will impede the application of IPE. Another issue is related to the availability of IPE facilitator (Fook et al., 2013). It is not only about the quantity but also the quality of the individual who will

teach IPE. According to Barr (2016), IPE facilitators should have the IPE competencies, which are skills of teamwork and collaboration, and value the role of other professions.

## CONCLUSION

Four out of the nine challenge categories were found in research conducted in Egypt as representatives of developing countries. However, this systematic review suggests that the other five challenges need to be an important consideration for developing countries who will initiate or are currently implementing an IPE programme. The challenges of implementing IPE founded in this study were synthesised into three topics, which are inter-professional relationships, IPE curriculum, and administration resources. Being aware of these potential challenges will increase the chances of building a successful and sustainable IPE programme. Research on the implementation of IPE in developing countries is still very rare. Therefore, it is highly recommended to extend research in developing countries, especially those that identify challenges and obstacles in the planning and implementation of IPE.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## REFERENCES

- Anderson, E., & Lennox, A. (2009). The Leicester model of interprofessional education: Developing, delivering and learning from student voices for 10 years. *Journal of Interprofessional Care*, 23(6), 557-573.
- Altin, S.V., Tebest, R., Kautz-Freimuth, S., Redaelli, M., & Stock, S. (2014). Barriers in the implementation of interprofessional education programs—A qualitative study from Germany. *BMC Medical Education*, 14, 227.
- Barnsteiner, J., Joanne, F., Disch, Hall, L., Mayer, D., & Moore, S. M. (2007). Promoting interprofessional education. *Nurse Outlook*, 55, 144-150. doi:10.1016/j.outlook.2007.03.003
- Barr, H. (2016). Responding as interprofessional educations to the WHO challenge. *Journal of Taibah University Medical Sciences*, 11(6), 505-509
- Bridges, D.R., Davidson, R.A., Odegard, R.S, Maki, I.V., & Tomkowiak, J. (2011). Interprofessional *collaboration*: three best practice models of interprofessional education. *Medical Education On-line*, 16, 6035. doi:10.3402/meo.v16i0.6035
- Canadian Interprofessional Health Collaborative (CIHC). (2010). A national interprofessional competency framework. Retrieved from <http://www.cihc.ca> (accessed 28 August 2017).
- Coaster, L. (2008). Challenges and opportunities for partnership in health development: A working paper. Geneva: WHO.

- Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004). *Should we be using learning styles? What research has to say to practice*. London: Learning and Skills Research Centre, LSDA
- Crocker, A., Fisher, K., & Smith, T. (2015). When students from different professions are co-located: The importance of interprofessional rapport for learning to work together. *Journal of Interprofessional Care*, 29, 41-48.
- D'amour, D., & Oandasan, I. (2005). Interprofessionality as the field of interprofessional practice and interprofessional education: An emerging concept, *Journal of Interprofessional Care*, 19 (Suppl 1), 18-20.
- D'Andrea, V.G.D. (2007). *Improving teaching and learning*. Berkshire: McGraw-Hill Education. Retrieved from: ProQuest Ebook Central. [30 May 2017].
- Dobbs-Oates, J., & Morris, C.W. (2016). The case for interprofessional education in teacher education and beyond. *Journal of Education for Teaching*, 42(1), 50-65. doi:10.1080/02607476.2015.1131363
- El-Awaisi, A. (2017). East meets Weast: Working together in interprofessional education and practice. *Journal of Interprofessional Education & Practice*, 7, 72-74.
- Emily, C. (2008). Evidence for nursing practice updates from the Joanna Briggs Institute. *Journal of Advanced Nursing*, 62(2), 270.
- Fook, J., D'Avray, L., Norrie, C., Psinos, M., Lamb, B., & Ross, F. (2013). Taking the long view: Exploring the development of interprofessional education. *Journal of Interprofessional Care*, 27, 286-291
- Forte, A., & Fowler, P. (2009). Participation in interprofessional education: An evaluation of student and staff experiences. *Journal of Interprofessional Care*, 23(1), 58-66.
- Freeth, D. (2001). Sustaining interprofessional collaboration. *Journal of Interprofessional Care*, 15, 37-46. doi:10.1080/13561820020022864
- Frenk, J., L., Chen, Z. A., Bhutta, J., Cohen, N., Crisp, T., Evans, H. (2010). Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *Lancet*, 376 (9756), 1923-1958.
- Goldberg, L. R. (2015). The importance of interprofessional education for students in communication sciences and disorders. *Communication Disorders Quarterly*, 36(2), 121-125.
- Grice, G. R., & Mccorkle., N.A. (2016). Difference in Student Pharmacist Attitudes and Readiness for Interprofessional Learning after an Activity with Student Nurses. *Journal of Interprofessional Education & Practice*, 3, 29-33. doi:10.1016/j.xjep.2016.04.005
- Hammick, M., Freeth, D., Koppel, I., Reeves, S., & Barr, H. (2007). A best evidence systematic review of interprofessional education: BEME guide no. 9. *Medical Teacher*, 29(8), 735-751. doi:10.1080/01421590701682576
- Hosny, S., Kamel, M.H., El-Wazir, Y., & Gilbert, J.(2013). Integrating interprofessional education in community-based learning activities: Case study. *Medical Teacher*, 35(1), S68-S73. doi:10.3109/0142159X.2013.765550
- Institute of Medicine (IOM). (1972). *Educating for the health team*. Washington, DC: National Academy of Sciences.

- Institute of Medicine (IOM). (2015). *Measuring the impact of interprofessional education (IPE) on collaborative practice and patient outcomes*. Washington DC: National Academies Press.
- Lapkin, S., Levett-Jones, T., & Gilligan, C. (2013). A systematic review of the effectiveness of interprofessional education in health professional programs. *Nurse Education Today*, 33, 90-102. doi:10.1016/j.nedt.2011.11.006
- Morison, S., Boohan, M., Jenkins, J., & Moutray, M. (2003). Facilitating undergraduate interprofessional learning in health care: Comparing classroom and clinical learning for nursing and medical students. *Learning in Health and Social Care*, 2(2), 92-104.
- Oandasan, I and Reeves, S. (2005). Key elements of interprofessional education. Part 2: Factors, processes and outcomes. *Journal of Interprofessional Care*, 9(1), 39-48.
- Reeves, S., Goldman, J., & Oandasan, I. (2007). Key factors in planning and implementing interprofessional education in health care settings. *Journal of Allied Health*, 36, 233-235.
- Reeves, S., Zwarenstein, M., Goldman, J., Barr, H., Freeth, D., Koppel, I., & Hammick M. (2010). The effectiveness of interprofessional education: Key findings from a new systematic review. *Journal of Interprofessional Care*, 24(3), 230-241. doi: 10.3109/13561820903163405
- Reeves, S., Perrier, L., Goldman, J., Freeth, D., & Zwarenstein, M. (2013). Interprofessional education: Effects on professional practice and healthcare outcomes (update). *Cochrane Database Systematic Review*, 3, CD002213.
- Rotz, M.E., & Duenas, G.G. (2016). "Collaborative-ready" students: Exploring factors that influence collaboration during a longitudinal interprofessional education practice experience. *Journal of Interprofessional Care*, 30, 238-241.
- Steinert, Y., Janny, W., Rocky, S. and Leins, R. (2005). Learning together to teach together: Interprofessional education and faculty development. *Journal of Interprofessional Care*, 19(Suppl 1), 60-75.
- Thurston, M.M., Chesson, M.M., Harris, E.C, & Ryan, G.J. (2017). Professional stereotypes of interprofessional education naive pharmacy and nursing students. *American Journal of Pharmacy Education*, 81(5), 84. doi:10.5688/ajpe81584
- VanKuiken, D.M., Schaefer J.K., & Hall, M.F. (2016). Integrating interprofessional education into the curriculum: Challenges and solutions for a university without a medical center. *Journal of Interprofessional Education and Practice*, 2, 5-11.
- Wilby, K.J., Al-Abdi, T., Hassan, A., Brown, M.A., Paravattil, B., & Khalifa, S.I. (2015). Attitudes of pharmacy and nutrition students towards team-based care after first exposure to interprofessional education in Qatar. *Journal of Interprofessional Care*, 29, 82-84.
- World Health Organization (WHO). (2010). *Framework for action on interprofessional education & collaborative practice*. Geneva: World Health Organization.
- Zeeni, N., Zeenny, R., Hasbini-Danawi, T., Asmar, N., Bassil, M., Nasser, S., ... & Hoffart, N. (2016). Student perceptions towards interprofessional education: Findings from a longitudinal study based in a Middle Eastern University. *Journal of Interprofessional Care*, 30(2), 165-174. doi:10.3109/13561820.2015.1117060

## **Impacts of Manual Handling Training and Lifting Devices on Risks of Back Pain among Nurses: An Integrative Literature Review**

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### **ABSTRACT**

**Background:** Musculoskeletal injuries, notably lower back injuries, are major occupational health problems among nurses. These injuries occur mainly due to incorrect use of body mechanics upon handling, lifting, and transfer of patients. It is the leading cause of occupational disability and is associated with increased healthcare costs. Reducing these injuries can lead to a significant reduction in healthcare costs.

**Purpose:** This integrative literature review aims to examine the impacts of manual handling and lifting devices on the risk of back pain among hospital nurses.

**Methods:** This study uses an integrative literature review design. Proquest, Science Direct, MEDLINE, and CINAHL were searched comprehensively. A Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) flow diagram was used to check the number of publications that were identified and screened for eligibility, and the number of publications excluded and reasons for exclusion. The Critical Appraisal Skills Programme (CASP) and the Centre for Evidence-Based Management critical appraisal checklist for a cross-sectional study (CEBM) were used to appraise the quality of selected articles.

**Results:** Fifteen studies were found to highlight the importance of manual handling training programs and the consistent use of lifting devices in the prevention of low back pain. Ergonomics training, proper body mechanics and posture, use of body slings, workplace characteristics, availability of equipments and complexity of work, lost work days including nurses' knowledge, experience, attitude and compliance are essential factors that impacts back pain.

**Conclusion:** Manual handling training programs and the use of patient lifting equipment are effective in preventing lower back pain among nurses.

**Keywords:** Lower back pain; musculoskeletal injuries; musculoskeletal pain; nurses; patient lifting devices

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## **BACKGROUND**

Nurses comprise the largest group of healthcare service providers, accounting for about 70 percent of all healthcare staff (Movahedi, Ghafari, Nazari, & Valiani, 2017). They spend more time with and provide more direct care to patients than any other type of healthcare worker (Tosunoz & Oztunc, 2017). At the same time, the hospital environment predisposes nurses to various physical problems and stress, making nursing a high-risk occupation (Movahedi et al., 2017). Indeed, nursing is a physically demanding profession that has been ranked second only to industrial occupations in terms of physical activity and is associated with high rates of musculoskeletal disorders (Sharafkhani, Khorsandi, Shamshi, & Ranjbaran, 2014). In the United States, nursing is identified as amongst the riskiest professions for back pain with the highest incidence of all forms of work-related, nonfatal injuries (Sanjoy, Ahsan, Nabi, Joy, & Hossain, 2017).

Nurses spend around 20 percent of their work time executing patient mobility and handling tasks. Safe patient handling and mobility tasks encompass any physical maneuver or activity that requires the nurse to move, transfer, or lift patients (Vendittelli Penprase, & Pittiglio, 2016). Musculoskeletal injuries emanating from manual handling injuries comprise a significant organizational, employee, and societal burden (Lee & Lee, 2017). Hence, healthcare organizations are increasingly focusing on environmental and organizational strategies to create a safety culture that entails the safe execution of patient mobility and handling tasks. Nonetheless, nurses continue to experience musculoskeletal injuries despite the heightened emphasis on training, education, injury prevention guidelines on SPHM, and ‘no lift policies’ (Vendittelli et al., 2016).

Manual handling includes any task that necessitates the use of force to restrain, hold, move, carry, pull, push, lower, or lift an object, animal, or person. Unsafe execution of such activities can increase the risk of injury. Research has demonstrated a significant association between manual handling and musculoskeletal injuries (McDermott, Haslam, Clemes, Williams, & Haslam, 2012). Evidence suggests that patient handling increases the risk of back injuries by up to 89 percent (Garg & Kapellusch, 2012). Heavy manual handling has been cited as a risk factor for work disability. However, it has been shown that education and training on manual handling can help reduce these risks (Garg & Kapellusch, 2012; McDermott et al., 2012).

Research on healthcare personnel training for patient handling and moving skills has demonstrated that, while training may result in enhanced work technique, evidence of this leading to reduced rates of musculoskeletal injuries is lacking (McDermott et al., 2012). Studies employing the economic effectiveness approach have demonstrated that training is more cost-effective than engineering controls, but that the overall effectiveness of training remains low (Garg & Kapellusch, 2012). In addition, evidence from reviews of randomized controlled trials demonstrates mixed results about the effectiveness of manual handling training in minimizing the risk of back pain amongst workers: some studies found no evidence and others demonstrated little evidence supporting the effectiveness of training on manual handling (McDermott et al., 2012).



Researchers have also identified potential reasons for the lack of effectiveness of training on manual handling. First, it is believed that a lack of refreshing or reinforcing safe practices may cause individuals to revert to previous customs and habits. Second, the emergency situations, reduced physical well-being, increased body weight, or a sudden quick movement may cause considerable body strain if such conditions were absent during training (McDermott et al., 2012). Third, the inherent risk may not be eliminated by behavior modification in the context of stressful job requirements (McDermott et al., 2012). These activities are believed to increase the risk of disorders of the lower back in nursing personnel (Garg & Kapellusch, 2012).

Psychological studies have reported that nurses experience high stress on the shoulder and lower back during manual patient lifting and transfer (Garg & Kapellusch, 2012). These factors highlight the need for performance and motivation as concepts in the training process. In the manual handling training context, performance refers to the efficient execution of manual handling tasks to reduce injuries in the long-term (Karahan & Bayraktar, 2013). Conversely, motivation entails the determination of employees to gain and use new skills (McDermott et al., 2012).

Notwithstanding the limited supporting evidence and doubts surrounding manual handling training effectiveness, healthcare organizations are obligated to train workers on manual handling (Lim, Black, Shah, Sarker, & Metcalfe, 2011). Moreover, the efficacy of assistive lifting devices in reducing the risk of musculoskeletal injuries has been examined; the available research suggests that these devices can reduce the risk of injury, but the evidence appears to be mixed (McDermott et al., 2012). Thus, evidence of the effects of manual handling training and lifting devices on the risk of back pain remains limited and inconclusive (McDermott et al., 2012).

## **PURPOSE**

The aim of this integrative literature review is to examine the impacts of manual handling training and lifting devices on the risk of back pain among hospital nurses.

## **METHODS**

### **Research design**

An integrative literature review method was employed to explore the impact of manual handling training and lifting devices on the risk of back pain amongst hospital nurses. It creates an objective summary, critique, and conclusions about a phenomenon through systematic search, thematic analyses, and categorization of past quantitative and qualitative research studies on the subject matter (Whittemore & Knafl, 2005). The design was chosen because of its comprehensive methodological approach that permits the inclusion of both experimental and non-experimental studies for an in-depth understanding of the phenomenon under review (Whittemore & Knafl, 2005). It combines data from both empirical and theoretical literature and permits the analysis of methodological problems on a given topic (De Souza, Da Silva, & De Carvalho, 2010).

Integrative literature review allows the research to accomplish various goals, including identification of gaps in current research, evaluation of scientific evidence strength, identification of significant issues in an area, bridging of knowledge gaps, generation of

a research question, exploration of successful research methods, and identification of a conceptual or theoretical framework, amongst other benefits (Russell, 2005). Therefore, this research design offers the most suitable approach to examine the impact of manual handling training and lifting devices on the risk of back pain amongst hospital nurses.

### Search strategy

A comprehensive literature search was conducted using the following academic electronic databases: ProQuest (Nursing & Health Alliance), Science Direct, MEDLINE, and the Cumulative Index of Nursing and Allied Health Literature (CINAHL). The search strategy involved the use of various keywords and Medical Subject Headings (MeSH) terms to guide the search. The first step involved the use of the following keywords: back pain, lower back pain, musculoskeletal injuries, musculoskeletal pain, nurses, nursing, nurse, lifting devices, manual handling, manual lifting, manual transfer, manual handling training, patient lifting, education, hospital, and hospitals (see Table 1). In addition, as the CINAHL and Medline databases use different terminology, the following Medical Subject Heading terms (MeSH) were used to retrieve the most relevant articles: 'Patient handling', 'Lifting', 'Back pain', 'Back injuries', 'Lifting and transfer equipment', 'Hospitals', and 'Nurses'. The initial search using these terms yielded numerous publications. The second step involved the use of the Boolean operators AND and OR to combine the MeSH/keywords and ensure a focused search.

*Table 1. Search keywords*

Manual handling (OR)		Back pain (OR)		Nurse (OR)		Hospital (OR)
Manual lifting (OR)		Lower back pain (OR)		Nurses (OR)		Hospitals
Manual handling training (OR)	AND	Musculoskeletal injuries	AND	Nursing	AND	
Lifting devices (OR)		Musculoskeletal pain				
Manual transfer (OR)						
Patient lifting (OR)						
Education (OR)						

### Exclusion criteria

Studies conducted in non-hospital settings, studies focused on causes of back pain rather than prevention, and studies concern with patients rather than nurses were not included in this study. A manual search of the reference lists of retrieved journal articles was performed to identify any additional relevant publications that the online search strategy did not capture for inclusion. The initial database search yielded a total of 347 publications; 15 articles were assessed based on quality appraisal and were found to be suitable for inclusion for critical analysis.

A flow diagram has been provided to show the number of publications that were identified and evaluated for eligibility (see Figure 1).

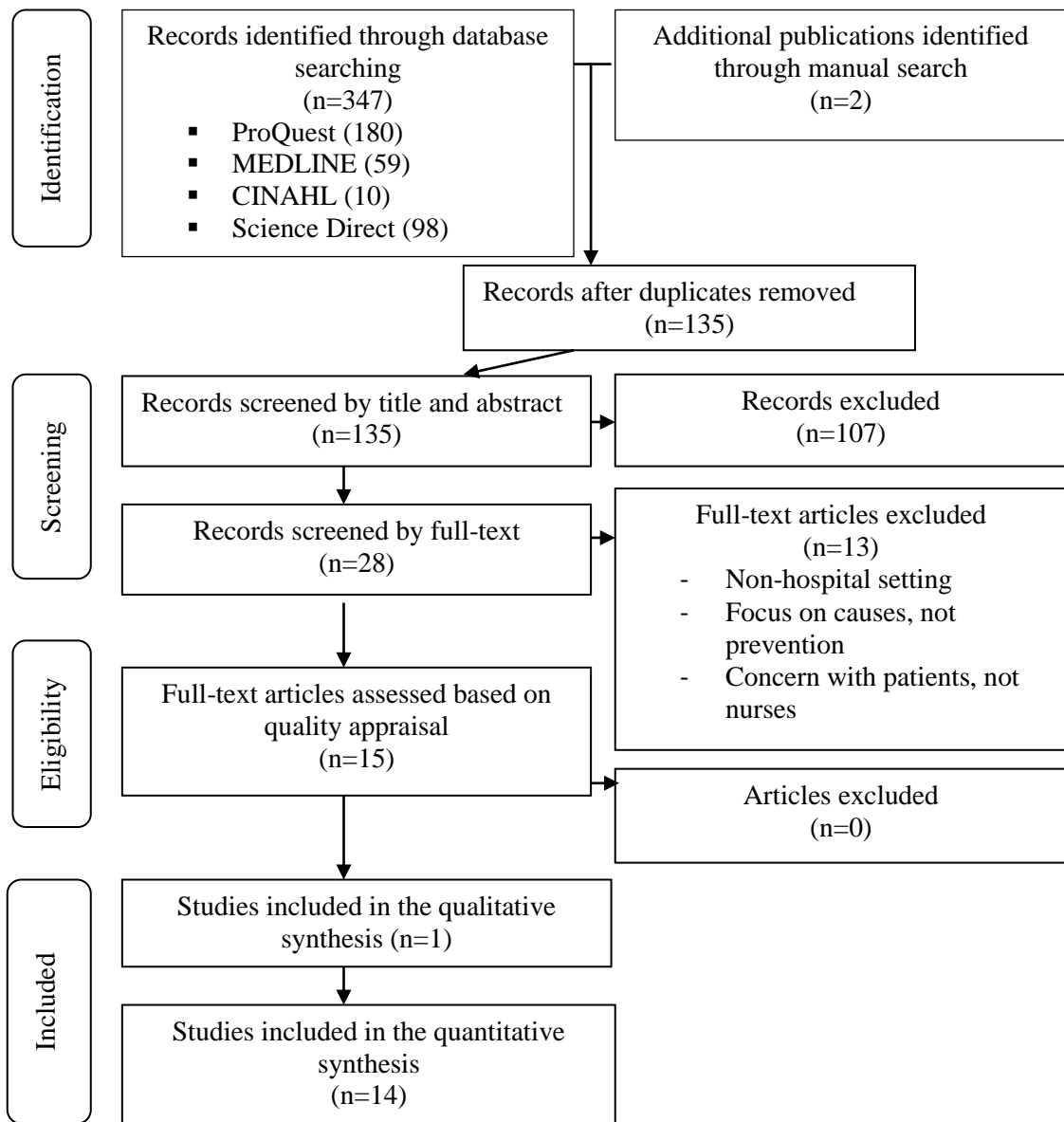


Figure 1. Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) flow diagram.

### Critical appraisal of the selected studies

Critical appraisal of the quality of research publications is a vital step in the integrative literature review process. For this integrative literature review, the Critical Appraisal Skills Programme (CASP) and the Center for Evidence-Based Management critical appraisal checklist for a cross-sectional study (CEBM) were chosen to appraise the quality of the selected research articles.

The CASP is a research appraisal tool consisting of 10 to 12 questions to help researchers conduct an in-depth exploration and make sense of a research study in a systematic manner. It outlines three broad issues that should be taken into consideration when appraising a research report. These issues focus on whether the trial is valid, on the results themselves, and on whether the results would help in local settings. CASP checklists have been developed for critical appraisal of the cohort, case-control, and qualitative studies as well as systematic reviews and randomized controlled trials (Nadelson & Nadelson, 2014). While various critical appraisal tools are available, the CASP tools were chosen for this review because they effectively and succinctly cover the areas required for critical appraisal of research reports (Nadelson & Nadelson, 2014). The CASP process offers a systematic process of identifying the weaknesses and strengths of a research study, thus improves the usefulness of a study and its findings (Nadelson & Nadelson, 2014).

Also, the Center for Evidence-Based Management critical appraisal checklist for a cross-sectional study (CEBM) was used (Center for Evidence-Based Management, 2014). Its 12 questions cover a study's aim, method, sample selections, presence of bias, and participants' response rate. Moreover, it assesses the measurement validity, statistical significance, and reporting confidence intervals, as well as whether the results can be applied in local practice settings.

## **RESULTS**

### **Characteristics of the selected studies**

#### ***Study designs***

Various research designs were used in different studies included in this paper. Overall, the majority of these studies were experimental and employed pre- and post-intervention research designs. Out of the fifteen reviewed studies, eight used pre- and post-intervention study designs (Black, Shah, Busch, Metcalfe, & Lim, 2011; Garg & Kapellusch, 2012; Hodder, MacKinnon, Rahlan, & Keir, 2010; Karahan & Bayraktar, 2013; Li, Wolf, & Evanoff, 2004; Resnick & Sanchez, 2009; Risor, Casper, Andersen, & Sorensen, 2017; Theis & Finkelstein, 2014). One study used an explorative study design (Karahan & Bayraktar, 2004), and another study employed a quasi-experimental study (Lim et al., 2011). Two of the reviewed studies used cross-sectional study designs (Lee, Faucett, Gillen, & Krause, 2013; Lee & Lee, 2017), and one study employed a descriptive survey design (Vendittelli et al., 2016). Also, there was one study with a qualitative study design (De Ruiter & Liaschenko, 2011), and one with a single-blinded randomized controlled trial research design (Jaromi, Nemeth, Kranicz, Laczko, & Betlehem, 2012).

#### ***Countries***

Of the fifteen articles selected for review, eight were carried out in various locations in the United States of America (USA). Specifically, one study was conducted in Southeast Michigan (Vendittelli et al., 2016), two in the State of Minnesota (De Ruiter & Liaschenko, 2011; Theis & Finkelstein, 2014), and one in the State of Florida (Resick & Sanchez, 2009). Also, one study was carried out in Missouri, USA (Li et al., 2004), two in the State of California (Lee & Lee, 2017; Lee et al., 2013), and one in Wisconsin, USA (Garg & Kapellusch, 2012). Two studies were carried out in Turkey in Bolu

(Karahan & Bayraktar, 2004) and the West Black sea (Karahan & Bayraktar, 2013). One study was conducted in Hungary (Jaromi et al., 2012), and another in the central region of Denmark (Risor et al., 2017). The remaining three studies were carried out in Saskatchewan, Canada (Black et al., 2011; Lim et al., 2011), and Newfoundland, Canada (Hodder et al., 2010).

### ***Sample size and sample characteristics***

The selected studies are different in the sample size. Three studies (Black et al., 2011; Garg & Kapellusch, 2012; Lim et al., 2011) used a quite large number of nurse participants. Their sample size was 766, 833, and 1480 participants, respectively. The remaining studies employed a lower number of participants, which range from 16 nurses (Resnick & Sanchez, 2009) to 443 nurses (Risor, et al., 2017). Moreover, one study recruited only female participants (Hodder et al., 2010) and 14 studies recruited both male and female nurses; however, the majority of them were females up to 90% (Black et al., 2011; Jaromi et al., 2012; Lee et al., 2013; Lim et al., 2011). All fifteen studies were carried out in many departments in different hospitals. Two studies were conducted in community hospitals (Black et al., 2011; Li et al., 2004), one in long-term care nursing facilities and chronic care hospital (Garg & Kapellusch, 2012), one study in rehabilitation hospital (Black et al., 2011) and the remaining studies took place in general hospitals (Hodder et al., 2010; Jaromi et al., 2012; Karahan & Bayraktar 2004; Karahan & Bayraktar, 2013; Lee et al., 2013; Lee & Lee, 2017; Lim et al., 2011; Resnick & Sanchez, 2009; Risor et al., 2017; Theis & Finkelstein, 2014; Vendittelli et al., 2016). Also, one study was carried exclusively in the intensive care unit (Lee et al., 2013) and another one in the emergency department (Resnick & Sanchez, 2009). Other studies were conducted in general departments. Moreover, seven studies highlight the importance of nurses' experience and knowledge (De Ruiter & Liaschenko, 2011; Hodder et al., 2010; Karahan & Bayraktar, 2004; Lee & Lee, 2017; Lim et al., 2011; Risor et al., 2017; Vendittelli et al., 2016) and five studies discuss nurses' compliance and attitude towards safe use of lifting devices (De Ruiter & Liaschenko, 2011; Lee & Lee 2017; Li et al., 2004; Resnick & Sanchez, 2009; Risor et al., 2017). Furthermore, the site of injuries was discussed in five studies (Black et al., 2011; Lee & Lee, 2017; Theis & Finkelstein, 2014; Vendittelli et al., 2016).

## **Manual handling training programs and patient lifting equipment**

### ***Ergonomics training***

Training is a process that facilitates the acquisition of skills in a given area. Training and education in body mechanics, transferring, and lifting techniques have been employed to reduce musculoskeletal disorders among nursing personnel, but their effectiveness is questionable (Vendittelli et al., 2016). Appropriate assistive devices for transferring patients, such as mechanical patient-lifting hoists, provide engineering solutions to biomechanical stressor reduction among nurses. Garg and Kapellusch (2012) conducted an intervention study to investigate the long-term efficacy of a comprehensive ergonomic intervention program that encompassed patient handling devices in various nursing facilities on patient-handling injuries to nurses. It revealed a reduction in patient-handling injuries after the implementation of the program. Perceived shoulder and low back stresses among nurses were also reasonably low. Also, most patients felt that the devices were safe and comfortable. The findings of this study

suggest that patient-handling devices implementation with a comprehensive program is likely to be effective in reducing back injuries among nurses (Garg & Kapellusch, 2012).

Similarly, Jaromi et al. (2012) investigated the effectiveness of an ergonomics training program called "Back School" on low back pain and body posture of nurses. They found out that the ergonomic training program resulted in a significant decrease in the intensity of lower back pain and improved body posture among nurses. It revealed that these effects were maintained during a six-month and one-year follow-up. These findings suggest that this intervention can be used in the management of nurses with chronic lower back pain (Jaromi et al., 2012). In another study, Kaharan and Bayraktar (2013) evaluated the effectiveness of an education program in low back pain prevention among nurses. They found out that the program improved the mean procedure scores and knowledge of nurses about the prevention of low back pain.

Similarly, Theis et al. (2014) found out that the safe patient handling program (STEPS) program resulted in a significant reduction in the number of injuries due to patient transfers. However, this effect was found to be short-term and was not sustained in the long-term. This suggests that retraining on the same program is essential to help achieve the desired effect of the reduction of work-related injuries in the long-term. The transfer, lifting, and repositioning (TLR) program were investigated by two studies (Black et al., 2011; Lim et al., 2011). The program focuses on musculoskeletal injury reduction by assessing, defining, and standardizing procedures and requirements of patient handling for each patient with the aim of ensuring both worker and patient safety. The TLR training program stresses and reinforces minimal use of physical effort by maximizing the use of equipment. Black and colleagues (2011) examined the effectiveness of the TLR program in reducing musculoskeletal disorders among direct health care providers. It is said that the implementation of the TLR program was associated with a reduction in all injury rates in the intervention group from 14.7 before the intervention to 8.1 after the intervention. The intervention group also experienced a decrease in time-loss injury from 5.3 to 2.5. After controlling for hospital and group size, the study revealed that the relative all-injury rate and time-loss injuries before and after intervention decreased by 30 percent and 18.6 percent, respectively. Their findings show that the TLR program is effective in reducing the risk of back pain in direct health care workers. This suggests that the TLR program can be implemented to reduce injury rates in health care practice (Black et al., 2011). Also, Lim et al. (2011) evaluated repeated patient handling injuries after the implementation of a multi-factor TLR program in health care workers. They found out that its implementation resulted in a reduction of work-related injury (Lim et al., 2011).

### ***Body mechanism and posture***

Poor body mechanics and poor posture are major risk factors for lower back pain. Proper body posturing and mechanics can reduce back pain. Various therapeutic approaches have been implemented in this regard (Jaromi et al., 2012). Evidence has shown a close association between correct body mechanics and lower back pain among nurses. The increase in the number of lower back pain cases among nurses has been attributed to incorrect use of body mechanics during work (Karahan & Bayraktar,

2004). Kaharan and Bayraktar (2004) investigated body mechanics use and lower back pain occurrence among nurses. They found that incorrect use of body mechanics was significantly associated with lower back pain. Factors such as heavy lifting and wearing high heels were associated with back pain among nurses. Nurses employed incorrect body mechanics when extending and lifting patients, and that this contributed to back pain. The findings of this study highlight the importance of correct body mechanics in nursing practice and the need to educate nurses on the same (Karahan & Bayraktar, 2004). Evidence has demonstrated that theoretical and practical training in transfer techniques can improve posture and other injury-associated risk factors (Hodder et al. 2010). The Back Injury Prevention Program (BIPP) is one of the intervention strategies that have been implemented to reduce back injuries. This program offers instruction on techniques of patient handling, identifies mechanisms of injury, and emphasizes back safety.

Furthermore, Hodder et al. (2010) have assessed the components BIPP in patient handling techniques and have found a reduction in muscle activity, lower spine angle variability, and smaller thoracolumbar spine angles. Overall, the BIPP patient transfer instruction has been associated with enhanced thoracolumbar biomechanics for experienced as well as new nursing staff (Hodder et al., 2010). Similarly, the Back School program focuses on minimizing the risk of back injury by increasing patients' knowledge and promoting behavior change through the adoption of good body posturing and proper lifting techniques during work (Jaromi et al., 2012). The BS program entails educating individuals about back anatomy and function, posture, and mechanical strain as well as providing isometric programs. It also includes information on patient transfer techniques, body mechanics, alternate body positioning during activities of daily living, standing posture, and sitting posture, among others. Implementation of the Back School program has been associated with significant improvement in healthcare workers' posture (Jaromi et al., 2012). Resnick and Sanchez (2009) contend that body mechanics training is one of the approaches that can be used to address the problem of lower back pain among nurses. They highlight the lack of a standardized training method for emergency nurses in manual handling of patients despite the high injury rates.

Consequently, Resnick and Sanchez (2009) evaluated the impact of various training protocols, including the use of realistic context in care delivery and the use of simulated emergency situations, on the postures of nurses and their compliances with the training. It revealed that all forms of training were associated with significant improvement in the torso flexion and rotation of nurses as well as nurses' compliance with safe patient handling practices. Additionally, they found out that contextual training resulted in the most significant improvement in all measures. The findings of this study suggest that contextual training approaches on safe patient handling can be used to reduce the risk of back injury among emergency nurses in their hectic and unpredictable healthcare environment (Resnick & Sanchez, 2009).

### ***Use of body sling***

Although body sling, including full-body sling, is useful in reducing the incidence of back pain among nurses, Theis and Finkelstein (2014) found out that staff did not use

positioning slings because they found it to cause disruption to patients' skin integrity and sleep as well as time-consuming. They also cited that the possibility of a lack of sufficient staff integration into the selection process of these devices, making it difficult for staff to fully appreciate their benefits in preventing injuries. This study highlights the need to incorporate and train staff in the selection and use of such devices to promote a culture that is safe and more accepting of equipment handling (Theis & Finkelstein, 2014). In another study, Hodder et al. (2010) cited patient condition as one of the factors that influence the use of body sling. Also, Risor et al. (2017) found out that their intervention was associated with increased sliding sheet use.

### **Workplace characteristics**

Research suggests that the safety practices of workers are influenced by psychosocial and organizational job factors. Precisely, workplace safety climate, which includes the shared perceptions of workers about the safety of the organizational and workplace safety practices, has been linked to higher safe work practices among various health care workers. Safety climate has been demonstrated to be the most influential factor linked to safe patient handling behaviors among nurses (Lee & Lee, 2017).

### ***Availability of equipment***

Unsafe handling of patients has been cited as a significant musculoskeletal injury risk factor among nurses (Lee & Lee, 2017). Musculoskeletal injuries remain common among nurses despite a heightened emphasis on "no lift" policies (Vendittelli et al., 2016). Lifting equipment is a significant component of programs that focus on safe patient handling. Available literature suggests that mechanical patient lifting equipment use is likely to reduce musculoskeletal injury risk from patient handling (Lee & Lee, 2017). Reductions in worker's compensation rates, injury rates, musculoskeletal discomfort, and biomechanical stress have been demonstrated in research following lifting equipment use (Vendittelli et al., 2016).

Consequently, promoting adequate lifting equipment use and eliminating risky manual lifting have become significant aspects of patient handling policies globally. However, despite advances in safe patient handling and mobility equipment, the equipment is often not readily available, may not be used, or may have inconsistent policies regarding their use (Vendittelli et al., 2016). Despite being available, concerns have been raised regarding the frequent use of these devices by nurses and other healthcare professionals (Lee et al., 2013). In addition to appropriate lift equipment use, various work behavior including patient cooperation, getting the required help from co-workers, physical environment assessment and correction, and patient and risk assessment are vital in the safe performance of patient handling tasks (Lee & Lee, 2017). It is believed that there is an association between the availability of lifting equipment and musculoskeletal pain. Lee and colleagues (2013) carried out a study to investigate the effectiveness of lifts on musculoskeletal pain based on lift availability and use. Their study revealed that greater lift availability and use was linked to fewer incidents of musculoskeletal pain among critical care nurses. Their findings suggest that ready availability of lifts is vital for the effectiveness of lift interventions. Also, the study highlights the need to eliminate barriers against lift use in health care practice (Lee et al., 2013).



Similarly, Lee and Lee (2017) conducted a study to investigate safe patient handling behavior and the use of lift among hospital nurses and the associated factors. Their study demonstrated a strong association between high patient handling behaviors and positive organizational safety climate. There was also a significant association between high lift use and high lift availability, as well as positive perceptions regarding lift use. They concluded that ensuring ready availability of lift equipment and promoting positive experiences and perceptions about lifts can be vital in ensuring lift equipment use (Lee & Lee, 2017). Similarly, Vendittelli et al. (2016) found out that adequate safe patient handling and mobility equipment were reported to be available by only 39.4 percent of the nurses investigated. This suggests the need for increased acquisition of safe patient handling and mobility equipment to prevent musculoskeletal injuries (Vendittelli et al., 2016).

### ***The complexity of daily care and culture of safety***

Research has demonstrated that patient handling in actual practice is complex and dynamic. Often, nurses are required to make rapid and ongoing assessments about patients and their environment. Various factors seem to influence the judgment of nurses regarding patient handling, including patients' overall mental and physical condition, patient size, patient preferences, and patient comfort. The realities of clinical practice highlight the importance of professional judgment and the autonomy of nurses on how some should be best handled. While excellent nursing care necessitates both judgment and knowledge, safe patient handling requires the application of guidelines and algorithms (De Ruiter & Liaschenko, 2011).

Workplace safety culture encompasses shared perceptions of workers regarding workplace safety and organization safety practices such as support and safety communication and management commitment. Safety culture has been cited as the most influential factors linked to safe patient handling behaviors among nurses (Lee & Lee, 2017). Consequently, hospitals have increased their focus on environmental and organizations aspects to create a safety culture that entails the safe execution of patient handling and mobility tasks (Vendittelli et al., 2016). Research has found that organizational safety culture is significantly associated with reduced experiences of musculoskeletal pain among healthcare providers (Lee & Lee, 2017). Vendittelli and colleagues (2016) carried out a descriptive study to explore hospital safety culture and the incidence of musculoskeletal injuries among new nurses. They found that environmental safety culture factors such as adequate staffing, the ability to refuse to engage in unsafe patient handling and mobility practice, a hospital interdisciplinary team, and the presence of a non-punitive environment were significantly associated with nurse injury incidence. Also, they noted that while there was evidence of commitment to safety culture, how this translates into actual practice needs further investigation (Vendittelli et al., 2016). Furthermore, research has shown that healthcare organizations with high safety culture and steadfast adherence to safe handling report the lowest incidence of musculoskeletal injuries among their employees (Theis & Finkelstein, 2014).

### ***Lost work days***

Musculoskeletal injuries arising from patient handling and mobility are the most frequent contributors to lost workdays among nurses and other direct patient care providers (Garg & Kapellusch, 2012; Jaromi et al., 2012). The number of lost workdays is a measure of the duration of disability arising from patient handling injuries and is representative of any preventive effects of an intervention (Black et al., 2011). A high number of lost workdays has facilitated the institution of safe patient handling programs in healthcare (Theis & Finkelstein, 2014). Black and colleagues (2014) explored the effectiveness of the engineering and administrative intervention for patient handling and found out that the intervention was associated with a significant decrease in time-loss days (from 35.99 days to 16.2 days) in the intervention groups (Black et al., 2011).

Similarly, Garg and Kapellusch (2012) found that implementation of a comprehensive ergonomics program was highly successful in reducing the number of lost workdays among nursing personnel. Their findings were also found a greater reduction in lost workdays relative to injuries, indicating less severity of post-intervention injuries, which enabled nursing personnel to resume employment much faster (Garg & Kapellusch, 2012). Jaromi and colleagues (2012) found out that the implementation of a spine training program had positive results, including fewer recurrent lower back pain episodes, improved spine functions, and decreased pain and disability intensity, factors that translate to decreased number of days off from low back pain (Jaromi et al., 2012). Also, it is believed that these programs can maintain reductions in staff injuries, thereby reducing the number of lost workdays (Theis & Finkelstein, 2014).

### **Individual characteristics**

#### ***Experience and knowledge***

Nurses' knowledge and experience seem to influence their judgment on safe patient handling and mobility. Lack of knowledge about safe patient handling is believed to be a significant contributor to lower back pain. Karahan and Bayraktar (2004) found out that nurses who lack knowledge of proper body mechanics have a higher likelihood of experiencing lower back pain. Lee and Lee (2017) cite a lack of knowledge as one of the significant barriers against lifting equipment use (Lee & Lee, 2017). Similar findings were reported by Vendittelli et al. (2016). Research has shown that nurses derive their knowledge on the safe handling of patients from various sources, including formal education, patient records, and prior experience with patient care (De Ruiter & Liaschenko, 2011). In particular, knowledge of a specific patient has been found to be critical to patient handling. The knowledge does not seem to be limited to aspects of the condition of the patient; rather, it encompasses any unique way that a patient can respond to being handled or moved (De Ruiter & Liaschenko, 2011). Knowledge of the patient is generally attained through subtle but intricate attention to sensory information. Subsequently, knowledge will inform how healthcare providers handle or help patients move. Research suggests that these sensory cues are a significant means through which nurses can know how to handle patients. If nurses lack this knowledge, they can employ previous experience with similar patients or consult colleagues with similar past experiences (De Ruiter & Liaschenko, 2011). Karahan and Bayraktar (2013) found that training nurses can significantly improve their knowledge and behavior on low back pain prevention. Their study revealed that the mean knowledge scores of nurses after

training were significantly higher than the pre-training scores. Another study by Hodder and colleagues (2010) demonstrated that experience affects patient transfer biomechanics. They found that experienced nurses are more likely to employ a smaller range of motion and a neutral spine posture than novice nurses, yet that had higher muscle activity compared to novices.

### ***Compliance and attitude toward the safe use of lifting device***

Nurses' attitudes are likely to influence their compliance with the safe use of lifting devices. Nurses are less likely to use lifting devices if they perceive those devices as posing a risk of harm to patients or that the equipment might malfunction (De Ruiter & Liaschenko, 2011). Similarly, Lee and Lee found out that the perceptions or attitudes of nurses towards lift use significantly influenced the use of such devices. They recommend the need to improve psychosocial working conditions to promote safe work practice and prevent musculoskeletal injuries (Lee & Lee, 2017). Research has shown that nurses are generally poorly compliant with the use of lifting devices. Li and colleagues (2004) found that the nurses used stand-up lifts occasionally and were most reluctant to use these devices for patient handling tasks. Nurses used stand-up lift equipment an average of 1.1 times each day instead of the required 3-4 times a day. Nurses in this study identified various reasons for failing to use stand-up lifts, including the lack of perceived need for using the devices for several transfers, lack of maneuvering space, and the increased time needed to use the equipment (Li et al., 2004). Risor et al. (2017) revealed that a multi-component patient-handling intervention was effective in improving nurses' attitudes towards patient-handling devices and their use. Resnick and Sanchez (2009) found that contextual training was more effective in promoting compliance with safe patient handling practices than classroom training.

### ***Site of injury***

Research has shown that back, shoulder, and neck are the most common parts of the body to sustain an injury during manual patient handling practices (Black et al., 2011). Lee et al. (2013) found a significant association between the availability of lifts and work-related shoulder and back pain, and the level of availability of patient handling devices influenced the place of injury. The study demonstrated that nurses who reported medium-level of availability of lifts had a 3.6 times less likelihood of sustaining work-related shoulder pain and nurses who reported high-level of availability of lifts had half the likelihood of sustaining low-back pain in their work compared to nurses without lifts. Concerning lift use, the study found out that nurses reporting medium-level lift use were three times less likely to experience work-related shoulder pain, whereas nurses with low-level use were three times more likely to develop neck pain (Lee et al., 2013). Lim et al. (2011) found out that any attempt to minimize ergonomic risk in one part of the body is likely to heighten the risk of injury in another body part. Lifting equipment reduced back strain; however, it increases stress on the shoulder.

## **DISCUSSION**

### **Training programs and lifting equipment**

Overall, the review has shown that training programs and the use of lifting equipment are effective in preventing back injuries among nurses. Safe patient-handling behaviors could be improved through training. Training on low back pain prevention can result in

significant improvement in nurses' behaviors and knowledge of safe patient-handling. They observed significant improvement in nurses' knowledge scores after the intervention, but these changes were not maintained in the long-term (Kaharan & Bayraktar, 2013). Theis and Finkelstein (2014) found that training and retraining on safe patient handling practices resulted in a significant reduction in musculoskeletal injuries among therapy and nursing staff. Resnick and Sanchez (2009) showed that specific training, particularly contextual training, on patient handling reduced the risk of back injury among emergency nurses. Similarly, Hodder et al. (2010) concluded that the training program, the BIPP, was effective in improving back posture and muscle activity during repositioning activities. Training reduced backload and the risk of injury by reducing peak muscle activity and spine deviation. Likewise, Jaromi et al. (2012) found out that the Back School program enabled study participants to display good body posture and beneficial spine movements, which resulted in reduced load to the back during daily activities. The study also revealed a significant long-term reduction in pain following the intervention, which was believed to be due to the adoption of the right body posture, observance of spine protection rules, and application of these elements to daily practice. Similar findings have been reported by other researchers (McDermott et al., 2012; Rasmussen, Holtermann, Bay, Sogaard, & Jorgensen, 2015). This shows that nurses who have learned appropriate body posture use are more likely to work safer and easier, thereby avoiding overloading spine movements and reducing the risk and relapse of lower back pain (Jaromi et al., 2012).

Black et al. (2011) demonstrated evidence that a multifactor program for direct care health workers was effective in preventing patient handling and mobility injuries. They supported the implementation of this program, particularly in smaller hospitals. They also found that the most significant decrease was evident in the number of lifting injuries, then transferring injuries, and lastly, repositioning injuries. Evidence suggests that a TLR program is likely to help prevent injuries during the performance on a single form of maneuver and not another based on the focus of the intervention. Additionally, it is believed that certain patient handling maneuvers are more stressful, with higher injury risk, implying that they could have enormous improvement potential (Black et al., 2011). These findings were supported in a study by Shojaei and colleagues (2017), which showed that a multidisciplinary workplace intervention employing social cognitive theory and using ergonomic posture training and education was effective in reducing the risk of work-related low back pain among nursing staff (Shojaei, Tavafian, Jamshidi, & Wagner, 2017). Garg and Kapellusch (2012) found out that implementation of ergonomics programs that involved modern patient-handling devices in seven nursing facilities resulted in a reduced number of injuries, workers' compensation costs, modified-duty days, and lost workdays linked to patient-handling tasks, despite an increase in the level of patient acuity post-intervention.

Additionally, they observed significant reductions in workers' compensation costs and lost workdays relative to patient-handling injuries, indicating less severity of injuries post-intervention and the ability of personnel to resume employment earlier due to patient-handling equipment availability. The study identified various intangible benefits of patient-handling device use and ergonomic program implementation, including nurses being less tired and their backs being less sore, being able to continue

employment, ability to work even when pregnant, and decreased employee absenteeism and improved morale (Garg & Kapellusch, 2012). These findings were supported by the study carried out by Andersen and colleagues (2014), which showed that persistent assistive device use was linked to reduced back injury risk among healthcare workers who transfer patients daily (Andersen et al., 2014).

Li et al. (2004) found out that mechanical patient lifts were effective in reducing injury rates, musculoskeletal symptoms, workers' compensation costs, and lost workday injury rates (Li et al., 2004). The findings of this study were supported by Burdorf and colleagues (2012), who showed that proper lifting device implementation resulted in reduced lower back pain and injury claims among health care workers. They recommended the implementation of programs to help minimize manual patient lifting in healthcare settings (Burdorf, Koppelaar & Evanoff, 2012). Similarly, Risor et al. (2016) found out that patient-handling equipment use led to improvements in nurse behaviors and attitudes on safe patient handling and reduced episodes of aggression. Lim et al. (2011) found that a multi-factor ergonomic intervention program reduced work-related repeated injuries among health care workers. Also, Humrickhouse and Knibbe (2016) found out that safe patient handling (SPH) programs were more effective in facilitating the improvement in safe patient handling and mobility practices and reducing musculoskeletal disorders among healthcare workers than single interventions. These findings are supported by Schoenfisch, Lipscomb, Pompeii, Myers, and Dement (2013).

### **Workplace environment**

Environmental factors seem to influence safe patient handling and mobility practices, including the use of lifting devices. Workplace safety culture encompasses shared perceptions of workers regarding workplace safety and organization safety practices such as support and safety communication and management commitment. Safety culture has been cited as the strongest factors linked to safe patient handling behaviors among nurses. Organizational safety culture is significantly associated with reduced experiences of musculoskeletal pain among healthcare providers (Lee & Lee, 2017). Environmental safety culture factors such as adequate staffing, the ability to refuse to engage in unsafe patient handling and mobility practice, a hospital interdisciplinary team, and the presence of a non-punitive environment are significantly associated with nurse injury incidence. However, evidence shows that while there was evidence of commitment to safety culture, how this translates into actual practice needs further investigation (Vendittelli et al., 2016). Furthermore, research has shown that healthcare organizations with high safety culture and firm adherence to safe handling report the lowest incidence of musculoskeletal injuries among their employees (Theis & Finkelstein, 2014).

Noble and Sweeney (2018) found out that environmental influences directly or indirectly affected the worker's commitment to or actual use of assistive devices. A study by Lee et al. (2013) revealed that great use and availability of lifts were linked to less musculoskeletal pain among nurses. They suggested the need to ensure the ready availability of lifts and the removal of barriers against their use in order to ensure the effectiveness of lift interventions. Similarly, in their study, Lee and Lee (2017) found

out that ergonomic practices, people-oriented culture, and favorable safety climate were significantly associated with safe patient handling behaviors. They also highlighted the need for promotion of safe patient-handling practices for injury prevention by organizational culture and safety practices. They also suggest the need to ensure ready equipment availability to improve experiences and positive perceptions regarding lifts and their use. Koppelaar and colleagues (2011) demonstrated that organizational factors such as easy accessibility and convenience, supportive management climate, and management support played an essential role in the successful lifting device implementation (Koppelaar, Knibbe, Miedema, & Burdorf, 2011).

### **Demographics**

The reviewed evidence did not show any significant association between gender and safe patient handling and mobility. However, there is some evidence suggesting that age could play a role. Vendittelli and colleagues found out that musculoskeletal injuries were more common among participants aged between 25 and 34 years (Vendittelli et al., 2016). They correlated these findings to the higher likelihood of nurses in this age group working in direct care positions as well as nurse inexperience. They highlight the need to educate and train new nurses on safe patient-handling practices to improve their knowledge, skills, and competence. Black et al. (2011) found that most musculoskeletal injuries occurred among female direct care workers with a mean age of 40 years. A study by Sikiru & Hanifa (2010) showed that the likelihood of female nurses to have back pain is higher compare to male nurses. Although Sikiru and Hanifa (2010) did not state an apparent reason for it, they relate it to the anatomical, physiological, and structural differences between males and females.

### **Knowledge**

Lack of knowledge about safe patient handling is believed to be a significant contributor to lower back pain (Sikiru & Hanifa 2010). The formal knowledge of handling patient safety that is taught in-services or classes focuses on moving patients in real space and time. Research has shown that knowledge of patients gained through the care experience is the most essential knowledge for safe patient handling. The foundation of this knowledge is mostly dependent on continuity of care. Nurses are only able to gain the knowledge required to make appropriate judgments needed for excellent care provision through continuity of care (De Ruiter & Liaschenko, 2011). However, it has been argued that the strategy used by experienced patient handlers to adjust postures to prevent low back pain can transfer loads to other joints, including the shoulder joint, thereby increasing injury risk to other tissues of the body. This suggests that they need to take into consideration other parts of the body, such as the shoulder joint in training programs focusing on patient handling and transfer (Hodder et al., 2010).

### **The complexity of daily care**

De Druiter and Liaschenko (2011) examined the factors that influence the judgment of nurses on how to move patients. They found out that the complexity of everyday care, patient treatment goals, time, and knowledge all influenced how nurses moved patients. The study also showed that almost all lifting equipment use needed a certain degree of manual handling. These findings suggest the need to take into account the professional judgment and autonomy of nurses on how to best handle certain situations (De Ruiter &

Liaschenko, 2011). The research also showed the conflict between patient goals achievement and exposure of nurses to injury risk, suggesting that nurses' focus on minimizing injury risk would compromise patient care. This highlights the need to acknowledge that the safety and interests of patients are closely interconnected with caregivers' safety (De Ruiter & Liaschenko 2011). Also, the study found that conditions of patients change rapidly over time, generally rendering irrelevant the best plans for moving them. Nurses are forced to make quick judgments to adjust to acute situations. These factors should be taken into account when developing guidelines on safe patient handling (De Ruiter & Liaschenko, 2011).

### **Barriers in implementing effective patient handling devices**

Lack of space for equipment use and non-availability of equipment have been identified as significant barriers to equipment use. Evidence also shows that nurses tend to be reluctant to use equipment that has failed in the past. Failure to take into account equipment failure is likely to expose patients and nurses to a higher risk of injury when the inevitable malfunction takes place. This risk can be minimized through ensuring equipment availability at the bedside and incorporating problem-solving into training (De Ruiter & Liaschenko, 2011). Noble and Sweeney (2018) found out that environmental, organizational, situational, and interpersonal influences directly or indirectly affect workers' commitment to or actual use of assistive devices. Time constraints were also found associated with less likelihood of the use of assistive devices. In another study, Koppelaar and colleagues (2011) found out that inclusion of guidelines and protocols of care, back pain presence in the last year, and nurse motivation were the strongest determinants of the use of lifting devices. They also found out that organizational factors, such as easy accessibility and convenience, supportive management climate, and management support, were linked to these determinants (Koppelaar et al., 2011). Similarly, Aslam and colleagues (2015) found that policy change, educational approaches, and technological interventions were all effective in reducing worker injuries and improving their safety. They also found out that these factors were associated with reduced worker compensation costs (Aslam, Davis, Felman, & Martin, 2015).

Karahan and Bayraktar (2004) identified the factors that contributed to the high rates of lower back pain among Turkish nurses, including heavy lifting, wearing high heels and incorrect use of body mechanics. In another study, Andersen et al. (2014) found out that daily patient transfers, history of a back injury, and pain, as perceived influence and seniority at work, were associated with increased back injury risk. Additionally, Al-Eisa and Al-Abbad (2013) identified the lack of workplace patient handling policy as significant risk factors for lower back pain development while regular exercise was a protective factor. Moreover, factors such as patients in isolation, inexperience in lift use, and high staff turnover are barriers to compliance. This suggests the need for incentive programs and additional training to promote compliance with these devices. Also, the adoption of no manual handling policies is likely to promote compliance with patient handling and mobility devices (Li et al., 2004).

### **Strengths and limitations**

This integrative literature review has various strengths. The studies reviewed were from different countries worldwide, suggesting that the findings are representative of a global population and can be applied to improve safe patient handling and mobility practices anywhere in the world. The use of various study designs in the reviewed studies is also an advantage. Also, most of the reviewed publications were current, suggesting that this review provides up-to-date evidence. However, there are some limitations. Some of the studies raised data quality concerns due to use of administrative data; lack of information of detailed injury and demographic characteristics of the subjects; and the short duration of pre- and post-intervention that made it difficult to identify general injury rate trends (Black et al., 2011). Another limitation is that some participants knew they were being observed, suggesting that they may have demonstrated more mindfulness of their posture during the study than during their typical work shift. This shows that the findings reported in the study may not be a true reflection of what actually happens on the ground (Hodder et al., 2010). In addition, some studies used small sample sizes, which suggest the need for well-designed studies with larger sample sizes to yield more reliable results (De Ruiter & Liaschenko, 2011; Li et al., 2004). One study used a quasi-experimental design for their study, suggesting the need for randomized controlled trials to confirm their findings before they can be applied in clinical practice (Lim et al., 2011).

### **Implications**

The findings of this review highlight the significance of manual handling training programs and the consistent use of lifting devices in low back pain prevention. Healthcare organizations should focus on training their direct healthcare providers to increase their knowledge of safe patient handling and mobility. This training must increase knowledge and lead to positive change in behavior (Karahana & Bayraktar, 2013). Research highlights the need for occupational health professionals to work together with hospital administrators and nurse educators to equip nurses with essential competence, knowledge, and skills to execute patient handling and mobility activities safely (Vendittelli et al., 2016). Additionally, there is a need to address the barriers to lifting device implementation and use to minimize the risk of lower back pain in this nurse population.

### **CONCLUSION**

Manual handling training programs and the use of patient lifting equipment are effective in preventing lower back pain among nurses. This is supported by several studies conducted globally. These studies have consistently revealed a reduction in patient-handling injuries after the implementation of education and training programs. The training which incorporates some strategies such as body mechanics, transferring and lifting techniques, that have been employed to reduce musculoskeletal disorder among nursing personnel, are effective.

There are several strategies to reduce risks such as the provision of safety climate, promotion of adequate lifting equipment, and ensure its availability and accessibility to healthcare workers and improving nurse's compliance with the proper use of lifting devices and transfer of patients. Hospital organizations hospitals should increase their



focus on environmental and organization aspects to create a safety culture that entails the safe execution of patient handling and mobility tasks. Safe patient handling and mobility programs should address these factors to improve compliance and effectiveness of their interventions.

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#### **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

#### **REFERENCES**

- Al-Eisa, E., & Al-Abbad, H. (2013). Occupational back pain among rehabilitation nurses in Saudi Arabia. *Workplace Health Safety*, 61(9), 401-407.
- Andersen, L. L., Burdorf, A., Fallentin, N., Persson, R., Jakobsen, M. D., Mortensen, ..., & Holtermann, A. (2014). Patient transfers and assistive devices: prospective cohort study on the risk for occupational back injury among healthcare workers. *Scand J Work Environ Health*, 40(1), 74-81. doi:10.5271/sjweh.3382.
- Aslam, I., Davis, S. A., Felman, S. R., & Martin, W. E. (2015). A review of patient lifting interventions to reduced healthcare worker injuries. *Workplace Health and Safety*, 63(6), 267-275.
- Black, T. R., Shah, S. M., Busch, A. J., Metcalfe, J., & Lim, H. J. (2011). Effect of transfer, lifting, and repositioning (TLR) injury prevention program on musculoskeletal injury among direct care workers. *Journal of occupational and environmental hygiene*, 8(4), 226-25.
- Burdorf, A., Koppelaar, E., & Evanoff, B. (2012). Assessment of the impact of lifting device use on low back pain and musculoskeletal injury claims among nurses. *Occupational and Environmental Medicine*, 70, 491-497.
- Center for Evidence Based Management. (2014). Critical appraisal checklist for cross-sectional study. Retrieved from <https://www.cebma.org/resources-and-tools/what-is-critical-appraisal/>
- De Souza, M. T., Da Silva, M. D., & De Carvalho, R. (2010). Integrative review: What is it? How to do it? *Einstein*, 8(1), 102-106.
- De Ruitter, H-P., & Liaschenko, J. (2011). To lift or not to lift: Patient-handling practices. *AAOHN Journal*, 59(8), 337-344.
- Garg, A., & Kapellusch, J. M. (2012). Long-term efficacy of an ergonomics program that includes patient-handling devices on reducing musculoskeletal injuries to nursing personnel. *Human Factors and Ergonomics Society*, 54(4), 608-625.
- Hodder, J. N., MacKinnon, S. N., Ralhan, A., & Keir, P. J. (2010). Effects of training and experience on patient transfer biomechanics. *International Journal of Industrial Ergonomics*, 40, 282-288.
- Humrickhouse, R, & Knibbe ,H,J (2016). The importance of Safe Patient Handling to Create a Culture of Safety: An Evidential Review. *The Ergonomics Open Journal*, 9(1), 27-42.

- Jaromi, M., Nemeth, A., Kranicz, J., Laczko, T., & Betlehem, J. (2012). Treatment and ergonomics training of work-related lower back pain and body posture problems for nurses. *Journal of Nursing, 21*, 1776-1784.
- Karahan, A., & Bayraktar, N. (2004). Determination of the usage of body mechanics in clinical settings and the occurrence of low back pain in nurses. *International Journal of Nursing Studies, 41*, 67-751
- Karahan, A., & Bayraktar, N. (2013). Effectiveness of an education program to prevent nurses' low back pain: An interventional study in Turkey. *Workplace Health & Safety, 61*(2), 73-79.
- Koppelaar, E., Knibbe, J. J., Miedema, H. S., & Burdorf, A. (2011). Individual and organizational determinants of use of ergonomic devices in healthcare. *Occupational and Environmental Medicine, 68*, 659-665.
- Lee, S., Faucett, J., Gillen, M., & Krause, N. (2013). Musculoskeletal pain among critical-care nurses y availability and use of patient lifting equipment: An analysis of cross-sectional survey data. *International Journal of Nursing Studies, 50*(12), 1648-1657.
- Lee, S-J., & Lee, J. H. (2017). Safe patient handling behaviors and lift use among hospital nurses: A cross-sectional study. *International Journal of Nursing Studies, 74*, 53-60.
- Li, J., Wolf, L., & Evanoff, B. (2004). Use of mechanical patient lifts decreased musculoskeletal symptoms and injuries among helath care workers. *Injury Prevention, 10*(44), 212-216.
- Lim, H. J., Black, T. R., Shah, S. M., Sarker, S., & Metcalfe, J. (2011). Evaluating repeated patient handling injuries following the implementation of a multi-factor ergonomic intervention program among health care workers. *Journal of Safety Research, 42*, 185-191.
- McDermott, H., Haslam, C., Clemes, S., Williams, C., & Haslam, R. (2012). Investigation of manual handling training practices in organization and beliefs regarding effectiveness. *International Journal of Industrial Ergonomics, 42*, 206-211.
- Movahedi, M., Ghafari, S., Nazari, F., & Valiani, M. (2017). The effects of acupressure on pain severity in female nurses with chronic low back pain. *Iranian Journal of Nursing and Midwifery Research, 22*(5), 339-342.
- Nadelson, S. S., & Nadelson, L. S. (2014). Evidence based practice article reviews using CASP tools: A method for teaching EBP. *Worldviews on Evidence-Based Nursing, 2014*, 1-3.
- Noble, N. L., & Sweeney, N. L. (2018). Barriers to the use of assistive devices in patient. *Continuing Education, 66*(1), 41-48.
- Rasmussen, C. D. N., Holtermann, A., Bay, H., Sogaard, K., & Jorgensen, M. B. (2015). A multifaceted workplace intervention for low back pain in nurses' aides: A pragmatic stepped wedge cluster randomized controlled trial. *Pain, 156*, 1786-1794.
- Resnick, M. L., & Sanchez, R. (2009). Reducing patient handling injuries through contextual training. *Journal of Emergency Nursing, 35*, 504-508.

- Risor, B. W., Casper, S. D., Andersen, L. L., & Sorensen, J. (2017). A multi-component patient-handling intervention improves attitudes and behaviors for safe patient handling and reduces aggression experienced by nursing staff: A controlled before-after study. *Applied Ergonomics*, *60*, 74-82.
- Russell, C. L. (2005). An overview of the integrative research review. *Progress in Transplantation*, *15*, 1-7.
- Sanjoy, S. S., Ahsan, G. U., Nabi, H., Joy, Z.F., & Hossain, A. (2017). Occupational factors and low back pain: A cross-sectional study of Bangladeshi female nurses. *BMC Research Notes*, *10*, 173-178.
- Schoenfisch, A. L., Lipscomb, H. J., Pompeii, L. A., Myers, D. J., & Dement, J. M. (2013). Musculoskeletal injuries among hospital patient care staff before and after implementation of patient lift and transfer equipment. *Scandinavian Journal of Work, Environment, and Health*, *39*(1), 27-36.
- Sharafkhani, N., Khorsandi, M., Shamshi, M., & Ranjbaran, M. (2014). Low back pain preventive behaviors among nurses based on the health belief model constructs. *SAGE Open*, *2014*, 1-7.
- Shojaei, S., Tavafian, S. S., Jamshidi, A. R., & Wagner, J. (2017). A multidisciplinary workplace intervention for chronic low back pain among nursing assistants in Iran. *Asian Spine Journal*, *11*(3), 419-426.
- Sikiru, L. & Hanifa, S. (2010). Prevalence and risk factors of low back pain among nurses in a typical Nigerian hospital. *African Health Science*, *10*(1), 26-30.
- Theis, J. L., & Finkelstein, M. J. (2014). Long-term effects of safe patient handling program on staff injuries. *Rehabilitation Nursing*, *39*, 26-35.
- Tosunoz, I. K., & Oztunc, G. (2017). Lower back pain in nurses. *International Journal of Caring Sciences*, *10*(3), 1728-1732.
- Vendittelli, D., Penprase, B., & Pittiglio, L. (2016). Musculoskeletal injury prevention for new nurses. *Workplace Health and Safety*, *64*(12), 573-585.
- Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing*, *52*(5), 546-553.

## **Effects of Early Warning Score (EWS) Tutorial Simulation on Nurses' Knowledge and Clinical Performance**

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### **ABSTRACT**

**Background:** The Early Warning Score (EWS) system has been recommended for an early identification tool of deterioration. However, its implementation has not been optimal, one of which is due to the low level of knowledge and understanding of EWS among nurses.

**Purpose:** This study aimed to determine the effects of EWS tutorial simulation on nurses' knowledge and clinical performance.

**Methods:** This study employed a pretest-posttest quasi-experimental design with a control group. Purposive sampling was used to recruit samples of 42 respondents each in the intervention group and control group. The data were collected using the questionnaires to measure knowledge and clinical performance and analyzed using Chi-square, Wilcoxon, and Mann-Whitney tests.

**Results:** The results showed that there were significant differences in the pre-test and post-test of knowledge and clinical performance in both groups ( $p < 0.001$ ). There was also a significant difference in clinical performance between the intervention group and the control group ( $p < 0.001$ ). However, no significant difference in knowledge was found.

**Conclusion:** Tutorial simulation of EWS had an effect on increasing nurses' clinical performance. Although there was no significant difference in knowledge between the intervention group and the control group, the intervention group showed a better value than the control group. EWS tutorial simulation can be used as one of the training methods to increase nurses' knowledge and clinical performance in EWS.

**Keywords:** Early warning score; clinical performance; knowledge; tutorial simulation

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### **BACKGROUND**

The care needs of patients with the acute illness have increased with the complexity of existing problems. Such conditions can trigger clinical deterioration that may develop into Serious Adverse Events (SAEs), such as cardiac arrest, unintended Intensive Care

Unit (ICU) admissions, as well as unexpected and preventable deaths (Taenzer, Pyke, & McGrath, 2011). A majority of SAEs begin with abnormal physiological changes and can develop into critical illness later (Corfield et al., 2014; Fagan, Sabel, Mehler, & MacKenzie, 2012). Early detection and appropriate interventions are important in improving the safety and effectiveness of care in patients with clinical signs of worsening (Alam et al., 2015).

Early Warning Score (EWS) system is a bedside tool developed for early identification of physiological deterioration by establishing numerical values of physiological parameters in which the results can be used to see the patient's condition; EWS is able to predict who is at risk of critical illness (Corfield et al., 2014). The implementation of EWS has not been optimal so far due to several obstacles, including poor understanding of physiological deterioration and triggering criteria (De Meester, Verspuy, Monsieurs & Van Bogaert, 2013); delays in recognition of staffs to worsening clinical condition of patients, which is associated with the level of knowledge and understanding of EWS (Bick et al., 2014); failure to complete and measure reliable vital signs, errors in calculating the EWS scores (Ludikhuizen, Smorenburg, de Rooij, & de Jonge, 2012); ineffectiveness of communication (Rabøl, Andersen, Østergaard, Bjørn, Lilja, & Mogensen, 2011); and weak clinical reasoning skills (Lapkin, Levett-jones, & Bellchambers, 2010).

Educational programs have been developed to assist staff in recognizing and managing worsening patient conditions, but lack of studies that evaluate the effects of educational programs on knowledge and clinical performance. The quality of nursing competence requires good performance in various nursing services. Nurses not only require adequate knowledge and skill in carrying out their duties and responsibilities, but they need to transform it into effective performance (Zhang, Luk, Arthur, & Wong, 2001) as actual performance is the most important outcome of education (Bradshaw & Hultquist, 2017; Khan & Ramachandran, 2012). Furthermore, Saab et al. (2017) suggest that EWS education programs can be used to increase nurse knowledge, self-confidence, and clinical performance.

A preliminary study conducted by the researchers in one of the hospitals in Indonesia showed that the implementation of EWS was still suboptimal. Furthermore, incorrect calculation of the EWS scores, as well as a non-standardized understanding of the EWS among nurses, were still found. Research on EWS training with tutorial simulation to increase nurses' knowledge and clinical performance has not been extensively investigated. Therefore, it is indeed necessary to investigate how such simulation affects nurses' knowledge and clinical performance.

## **PURPOSE**

The purpose of this study was to determine the effects of EWS tutorial simulation on nurses' knowledge and clinical performance.

## **METHODS**

### **Research design**

The present study used a pretest-posttest quasi-experimental research design with a control group.

### **Samples and setting**

This study was conducted at one hospital in Indonesia. A purposive sampling method was utilized to recruit the samples of nurses who met the inclusion criteria: working in an adult inpatient room, never receiving EWS training, and had been working for at least two years. Forty-two respondents who met the inclusion criteria in each of the intervention group and the control group participated in this study.

### **Research instrument and data collection**

The instruments used in this study were the knowledge questionnaire and the Rescuing a Patient in Deteriorating Situations tool (RAPIDS tool). The knowledge questionnaire consisted of respondents' characteristics and 20 questions related to the concept and implementation of the EWS in handling patients showing signs of deterioration. This questionnaire was developed in accordance with the New Early Warning Score (NEWS) guidelines based on the Royal College of Physician (2017) and National Clinical Effectiveness Committee (2014). The questionnaire is a linked scale (1-5) with a total score of 100.

The instrument used to measure clinical performance was the modified RAPIDS tool (Liaw, Chan, Chen, Hooi, & Siau, 2014). RAPIDS tool is an instrument for measuring the clinical performance of respondents in early detection of changes in vital signs, nursing assessments and interventions through Airway, Breathing, Circulation, Disability, Exposure/Examinations (A, B, C, D, E) and reported clinical deterioration using ISBAR communication. The RAPIDS modification tool consisted of three parts. Part 1 contained the assessment of clinical deterioration with ABCDE. Part 2 contained the clinical response of nurses in dealing with patients with or at risk of worsening clinical conditions. This integrated clinical judgment (demonstrated by the ability to determine appropriate EWS scores), critical thinking, and clinical reasoning could be seen in the actions of nurses in following up deterioration and monitoring frequency. Part 3 contained communication using ISBAR to see nurses' expertise in reporting patient conditions. Permission to use the RAPIDS tools was obtained from the instrument's owner (Liaw et al., 2014), for which the validity and reliability of the instrument had been carried out. The original instrument was then translated and modified by adjusting the instrument points with the latest EWS concept, updated NEWS 2017, and consulted with expert judgment. Validity testing using expert judgment was carried out on two experts by examining the question items. The knowledge questionnaire was tested for validity using Pearson's product moments with computer aids. Based on the validity test on the knowledge questionnaire, all 20 question items were valid. The reliability test was carried out using the formula Kuder Richardson 20 (KR-20) and the instrument was reliable.

Pre-test and post-test on both groups were conducted on the same day. All respondents both in the intervention group and the control group were separately collected in the training room to take a 20-minute knowledge and clinical performance using the

knowledge questionnaires. The EWS tutorial simulation was administered in the intervention group sequentially. First, the EWS tutorial was given to all respondents for 90 minutes, then continued with a 60-minute case simulation. The simulation was given to the respondents in three large groups by the researchers and two trained research assistants. The control group received the EWS tutorial training for 90 minutes without case simulations.

### Data analysis

Univariate and bivariate analyses were conducted in this study. Data processed using the univariate analysis were general information on the characteristics of respondents. Bivariate analysis was used to determine the relationship between independent and dependent variables. Data analysis began with conducting data normality tests using Shapiro-Wilk as the number of respondents was less than 50 respondents in each group. The results of the normality test showed that the existing data, both knowledge, and clinical performance, had an abnormal distribution. Furthermore, the Wilcoxon test was used to see differences between the pre-test and post-test of knowledge and clinical performance within groups, while the Mann-Whitney test was used to see differences in the pre-test and post-test of knowledge and clinical performance between groups.

### Ethical consideration

Prior to the study, all respondents expressing agreement to participate in the study were informed of the objectives, benefits, and procedures of the research. They were also requested to sign informed consent. Respecting the privacy and confidentiality of respondents, providing training fairly, providing benefits, and avoiding dangerous actions were ensured during the study. This research had been reviewed and obtained ethical permission from the ethics and research committee in the Faculty of Nursing, Universitas Padjadjaran, Bandung, Indonesia.

## RESULTS

### Characteristics of respondents

The results of the study, as presented in Table 1, showed that more than half of the respondents in the intervention group and the control group were women and aged 30 to 39 years. A majority of respondents in both groups hold diploma education and had working experiences of less than five years. The characteristic data, both in the intervention and control groups, were not significantly different ( $p>0.05$ ).

Table 1. Characteristics of respondents (n=84)

Category	Intervention		Control	
	<i>f</i>	%	<i>f</i>	%
Gender				
Male	15	35.7	16	38.1
Female	27	64.3	26	61.9
Age				
<30 years old	15	35.7	15	35.7
30-39 years old	23	54.8	22	52.4
≥40 years old	4	9.5	5	11.9

Category	Intervention		Control	
	<i>f</i>	%	<i>f</i>	%
Educational attainment				
Diploma	34	81	28	66.7
Bachelor's degree	8	19	14	33.3
Length of work experience				
Less than 5 years	29	69	27	64.3
More than 5 years	13	31	15	35.7

### Differences in knowledge

The results in Table 2 show that there was no significant difference in the pre-test value of knowledge between the intervention group and the control group ( $p=0.100$ ). The knowledge significantly increased in both groups after the implementation of EWS tutorial simulation ( $p<0.001$ ), but there was no difference in knowledge between the intervention and control group ( $p=0.195$ ). However, the intervention had a higher increase in knowledge percentage than the control group.

Table 2. Differences between pre-test and post-test of knowledge ( $n=84$ )

Knowledge	Group		<i>p</i> *
	Intervention	Control	
Pre-test:			
Median	50	45	0.100
Minimal - Maximal	30-70	25-80	
Post-test:			
Median	75	65	0.001
Minimal - Maximal	60-90	40-90	
Delta Differences within Groups			
Pre-test vs Post-test	$p^{**}<0.001$	$p^{**}<0.001$	
Delta Differences between Groups			
Mean	- 22.62	- 19.05	0.195
Percentage	50.25%	49.14%	

Notes: \*Mann-Whitney; \*\*Wilcoxon

As presented in Table 3, before the intervention, a majority of respondents both in the intervention group and control group had a poor level of knowledge, i.e., 64.2% and 85.7%, respectively. After the intervention, a majority of respondents in the intervention group had a good level of knowledge (57.1%), while the control group had an intermediate level of knowledge (52.4%).

### Differences in clinical performance

There was no significant difference in the pre-test value of clinical performance between the intervention group and the control group ( $p=0.323$ ). The clinical performance scores significantly increased in both groups after the implementation of EWS tutorial simulation ( $p<0.001$ ). Likewise, there was a significant difference in clinical performance scores between the intervention and control group ( $p=0.001$ ), in which the increase of



clinical performance in the intervention group was almost double compared to the control group (Table 4).

Table 3. Knowledge of pre-test and post-test by category (n=84)

Category	Pre-test		p	Post-test		p
	Intervention	Control		Intervention	Control	
	f (%)	f (%)		f (%)	f (%)	
Knowledge						
Good ( $\geq 75\%$ )	2 (4.8)	2 (4.8)		24 (57.1)	8 (19)	
Intermediate (60-74%)	13 (31)	4 (9.5)	0.49	18 (42.9)	22 (52.4)	0.001
Poor (<60%)	27 (64.2)	36 (85.7)		0 (0)	12 (28.6)	

The difference in clinical performance scores between the intervention and control group is presented in Table 4.

Table 4. Differences between pre-test and post-test of clinical performance (n=84)

Clinical performance	Group		p*
	Intervention	Control	
Pre-test			
Median	52	50	0.323
Minimal-maximal	44-60	40-60	
Post-test			
Median	74	64	0.001
Minimal-maximal	60-84	52-68	
Delta differences within groups			
Pre-test vs. post-test	$p^{**}<0.001$	$p^{**}<0.001$	
Delta differences between groups (pre-test vs. post-test)			
Mean	-5.45	-2.76	0.001
Percentage	42.44%	21.62%	

Notes: \*Mann-Whitney; \*\*Wilcoxon

### Clinical performance related to Early Warning Score

Based on Table 5, it can be seen that the pre-test results of clinical performance in the intervention group and the control group were almost the same. There was a significant difference in the posttest results of clinical performance between the intervention and the control groups ( $p=0.012$ ).

Table 5. Clinical performance of pre-test and post-test based on category (n=84)

Category	Pre-test		p	Post-test		p
	Intervention	Control		Intervention	Control	
	f (%)	f (%)		f (%)	f (%)	
Clinical Performance						
Good ( $\geq 90\%$ )	0 (0)	0 (0)		7 (16.7)	0 (0)	
Intermediate (50-89%)	28 (66.7)	28 (66.7)	1	35 (83.3)	42 (100)	0.012
Poor (<50%)	14 (33.3)	14 (33.3)		0 (0)	0 (0)	

## **DISCUSSION**

### **Effects of EWS simulation tutorial on knowledge**

This study showed that pre-test knowledge was mostly in the poor category, both in the intervention group and in the control group. In the post-test, the intervention group and control group showed an increase in the good category by 57.1% and 19%, respectively. There was a significant difference in the pre-test and post-test knowledge within groups, both in the intervention group and in the control group. In contrast, there was no significant difference in the pre-test and post-test knowledge values between the intervention group and the control group.

Based on the results of this study, it can be seen that EWS tutorial simulation could increase nurses' knowledge related to EWS, although there was no statistically significant difference in effects when compared to the control group. It may be noted that the post-test score of knowledge in the intervention group was better than the control group. Jeffries (2016) stated that outcomes in nursing education are knowledge, performance skills, learner satisfaction, critical thinking, and self-confidence. This is supported by Cahill et al. (2011) that the educational program carried out for handling worsening patient conditions by introducing a new chart (A, B, C, D with AVPU) in observation proved to be able to increase nurses' compliance in filling (recording) vital signs.

Tutorial learning (lecture) is a method needed to get abstract conceptual, while for concrete experiences, it is easy to get with simulations (Billings & Halstead, 2016). Simulations will encourage the application of knowledge and skills in real care settings. Therefore, simulations require basic knowledge that must be possessed by respondents in advance so that they can carry out clinical skills and have the ability to apply case handling algorithms (Curtin, Finn, Czosnowski, Whitman, & Cawley, 2011).

The intervention group received training in the form of a tutorial with a simulation of a case. The insignificant difference in increasing knowledge between the intervention group and the control group was different from other studies. Research conducted by Ozekcin, Tuite, Willner, and Hravnak (2015) showed that giving a tutorial before simulation is expected to increase respondents' knowledge, as cognitive processes precede decisions to act, whereas simulation programs are widely used to teach psychomotor skills and hone clinical decision-making abilities (Gantt, 2010; Ogilvie, Cragg, & Foulds, 2011). It is in line with Law (2014), which states that the simulation model has a significant impact on clinical performance.

### **Effects of EWS simulation tutorials on clinical performance**

Based on this study, it was found that the pre-test clinical performance was mostly in the intermediate category, both in the intervention group and the control group, but in the post-test, the intervention group showed an increase in the good category by 16.7%, while the control groups were all in enough categories. Differences in the difference between pre-test and post-test clinical performance in groups showed  $p < 0.001$ . The EWS simulation tutorial has a better effect on clinical performance than the EWS tutorial. These results are in line with Law's (2014) study, which states that simulation models have a significant impact on clinical performance. This is also supported by Liaw et al. (2016), which state that educational programs related to patient aids in worsening

situations can improve nurses' knowledge and clinical performance in the inpatient room in handling clinical deterioration of patients in a simulation setting. There are five categories of clinical competence in nurses, namely, clinical expertise, knowledge and understanding, interpersonal attributes, problem solving and clinical decisions, and technical expertise (Zhang et al., 2001). The interaction between knowledge and skill will encourage the realization of excellent performance (Boyatzis, 1982).

The results of this study also reinforce previous research, reporting that providing education or EWS tutorial training in the control group and EWS simulation tutorial in the intervention group caused changes in the form of increased knowledge and clinical performance of nurses, especially in the handling of worsening clinical conditions of patients. Today nurses do not only require adequate knowledge and skills in carrying out their duties and responsibilities but must be able to transform effective performance in every new situation (Lindsey & Jenkins, 2013; Saab et al., 2017). The need for knowledge and good clinical performance from nurses increases along with the reality that all acute care in hospitals has now increased the number of patients with complex health problems. In other words, there is an increase in the number of patients at risk of worsening clinical conditions, which if not handled properly and correctly, will lead to Serious Adverse Events (SAE'S) such as cardiac arrest in hospitals, unintended ICU admissions, and unexpected deaths (Taenzer et al., 2011). In fact, most of SAE'S is preceded by signs of deterioration, which is in the form of changes in vital signs (Fagan et al., 2012). Therefore, SAE's should not have happened or at least preventable occurrence rates.

The EWS tutorial-simulation combines two learning methods, namely tutorial, and simulation. This is in line with Scalese, Obeso, and Issenberg (2008), who claim that the actual clinical meeting model is a simulation because this method provides an opportunity for educators to evaluate the clinical performance of participants in a simulated environment. It is also supported by Meakim et al. (2013) that clinical simulation requires participants in education to have clinical knowledge in advance, so they can demonstrate clinical skills, and have the ability to apply case management algorithms, analyze patient responses, and evaluate outcomes so that successful patient management is realized.

Su and Juestel (2010) state that clinical simulations are capable of honing critical thinking and clinical judgment and the clinical decision-making will increase according to experience (Lake, Moss, & Duke, 2009; Tanner, 2006). Simulation is also able to improve psychomotor abilities, self-confidence, and clinical judgment (Bambini, Washburn, & Perkins, 2009), as well as able to improve critical thinking, performance skills, knowledge, and clinical reasoning from the subject matter (Lapkin et al., 2010). Clinical judgment is often described as a synonym of a combination of critical thinking and clinical reasoning (Lindsey & Jenkins, 2013), while these factors, i.e., psychomotor, cognitive, affective, non-clinical skills (teamwork, decision-making, planning), emotional status, personality traits, environmental factors, psychological, and physical status are all factors that affect performance (Ten Cate, Snell, & Carraccio, 2010). Performance is a competency that can be considered as specific behavior (behavior) and also referred to as actual behavior in certain situations (Thompson & Dowding, 2002). Education, training, and competence are mandatory requirements for all health staff in conducting the assessment and monitoring of acutely sick patients, clinical staff for EWS

scores of seven or more should have competency in critical nursing expertise and airway management (Royal College of Physician, 2017).

## CONCLUSION

The result of this study showed that there was a significant difference in nurses' clinical performance between the intervention and the control groups after the implementation of EWS tutorial simulation. In terms of knowledge, there was no significant difference between the groups. This EWS simulation tutorial can be used as an optional training method to improve clinical performance among nurses. Future studies should consider the modification of the intervention in the duration and post-test measurement for better outcomes.

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## CONFLICT OF INTEREST

None.

## REFERENCES

- Alam, N., Vegting, I. L., Houben, E., van Berkel, B., Vaughan, L., Kramer, M. H. H., & Nanayakkara, P. W. B. (2015). Exploring the performance of the National Early Warning Score (NEWS) in a European emergency department. *Resuscitation*, *90*, 111-115.
- Bambini, D., Washburn, J., & Perkins, R. (2009). Outcomes of clinical simulation for novice nursing students: Communication, confidence, clinical judgment. *Nursing Education Perspectives*, *30*(2), 79-82.
- Bick, D. E., Beake, S., Hundley, V., van Tiejlingen, E., Sheppard, Z. A., Thomas, S., & Smith, G. B. (2014). A national cross-sectional survey of heads of midwifery services of uptake, benefits and barriers to use of obstetric early warning systems (EWS) by midwives. *Midwifery*, *30*(11), 1140-1146.
- Billings, D. M., & Halstead, J. A. (2016). *Teaching in nursing: A guide for faculty*. (5<sup>th</sup>ed.). United States of America: Elsevier.
- Boyatzis, R. E. (1982). *The component manager: A model for effective performance*. New York: John Wiley & Sons.
- Bradshaw, M. J. & Hultquist, B. L. (2017). *Innovative teaching strategies in nursing and related health professions*. (7<sup>th</sup>ed.). United States of America: Jones & Bartlett Learning.
- Cahill, H., Jones, A., Herkes, R., Cook, K., Stirling, A., Halbert, T., ... Gattas, D. J. (2011). Introduction of a new observation chart and education programme is associated with better rates of vital-sign ascertainment in hospital wards. *BMJ Quality and Safety*, *20*(9), 791-796.
- Corfield, A. R., Lees, F., Zealley, I., Houston, G., Dickie, S., Ward, K., & McGuffie, C. (2014). Utility of a single early warning score in patients with sepsis in the emergency department. *Emergency Medicine Journal*, *31*(6), 482-487.
- Curtin, L. B., Finn, L. A., Czosnowski, Q. A., Whitman, C. B., & Cawley, M. J. (2011). Computer-based simulation training to improve learning outcomes in mannequin-

- based simulation exercises. *American Journal of Pharmaceutical Education*, 75(6), 113. doi:10.5688/ajpe756113
- De Meester, K., Verspuy, M., Monsieurs, K. G., Van Bogaert P. (2013). SBAR improves nurse–physician communication and reduces unexpected death: A pre and post intervention study. *Resuscitation*, 84(9), 1192-1196.
- Fagan, K., Sabel, A., Mehler, P. S., & MacKenzie, T. D. (2012). Vital sign abnormalities, rapids respon, and adverse outcomes in hospitalized patients. *American Journal of Medical Quality*, 27(6), 480-486.
- Gantt, L. T. (2010). Using the Clark simulation evaluation rubric with associate degree and baccalaureate nursing students. *Nursing Education Perspectives*, 31(2), 101-105.
- Jeffries, P. R. (2016). *The NLN Jeffries simulation theory*. New York, NY: National League of Nursing.
- Khan, K., & Ramachandran, S. (2012). Conceptual framework for performance assessment: Competency, competence and performance in the context of assessments in healthcare-Deciphering the terminology. *Medical Teacher*, 34(11), 920-928.
- Lake, S., Moss, C., & Duke, J. (2009). Nursing prioritization of the patient need for care: A tacit knowledge embedded in the clinical decision-making literature. *International Journal of Nursing Practice*, 15(5), 376-388.
- Lapkin, S., Levett-jones, T., & Bellchambers, H. (2010). Effectiveness of patient simulation manikins in teaching clinical reasoning skills to undergraduate nursing students: A systematic review. *Clinical Simulation in Nursing*, 6(6), e207-e222.
- Law, A. M. (2014). A tutorial on design of experiments for simulation modeling. *Proceedings of the Winter Simulation Conference 2014* (pp.66-80). Savannah, GA, USA: IEEE. doi:10.1109/WSC.2014.7019878
- Liaw, S. Y., Chan, S. W. C., Chen, F. G., Hooi, S. C., & Siau, C. (2014). Comparison of virtual patient simulation with Mannequin-based simulation for improving clinical performances in assessing and managing clinical deterioration: Randomized controlled trial. *Journal of Medical Internet Research*, 16(9), e214.
- Liaw, S. Y., Wong, L. F., Lim, E. Y. P., Ang, S. B. L., Mujumdar, S., Ho, J. T. Y., ... & Ang, E. N. (2016). Effectiveness of a web-based simulation in improving nurses' workplace practice with deteriorating ward patients: A pre- and post intervention study. *Journal of Medical Internet Research*, 18(2), e37.
- Lindsey, P. L., & Jenkins, S. (2013). Nursing students' clinical judgment regarding rapids response: The influence of a clinical simulation education intervention. *Nursing Forum*, 48(1), 61-70. doi:10.1111/nuf.12002
- Ludikhuizen, J., Smorenburg, S. M., de Rooij, S. E., & de Jonge, E. (2012). Identification of deteriorating patients on general wards; measurement of vital parameters and potential effectiveness of the modified early warning score. *Journal of Critical Care*, 27(4), 424.e7-424.e13.
- Meakim, C., Boese, T., Decker, S., Franklin, A.E, Gloe, D., Lioce, L, ...& Borum, J. C. (2013). Standart of the best practice: Simulation standart I: Terminology. *Clinical Simulation in Nursing*, 9, S3-S11. doi:10. 1016j.ecns.2013.04.001
- National Clinical Effectiveness Committee. (2014). *Second Annual Report 2014*. An Roinn Slainte Department of Health. Retrieved from <https://assets.gov.ie/11508/bd7e535c192f4c49984e4fc4517cfb41.pdf>

- Ogilvie, S., Cragg, B., Foulds, B. (2011). Perceptions of nursing students on the process and outcomes of a simulation experience. *Nurse Educator*, 36(2), 56-8. doi:10.1097/NNE.0b013e31820b4fd5.
- Ozekcin, L. R., Tuite, P., Willner, K., & Hravnak, M. (2015). Simulation education: Early identification of patient physiologic deterioration by acute care nurses. *Clinical Nurse Specialist*, 29, 166-173. Doi:10.1097/NUR.000000000000123
- Rabøl, L. I., Andersen, M. L., Østergaard, D., Bjørn, B., Lilja, B., & Mogensen, T. (2011). Descriptions of verbal communication errors between staff. An analysis of 84 root cause analysis-reports from Danish hospitals. *BMJ Quality & Safety*, 20(3), 268-274. doi:10.1136/bmjqs.2010.040238
- Royal College of Physicians. (2017). *National Early Warning Score (NEWS) 2. Standardising the assessment of acute-illness severity in the NHS updated report of a working party-executive summary and recommendations*. Retrieved from <https://www.rcplondon.ac.uk/projects/outputs/national-early-warning-score-news-2>
- Saab, M. M., McCarthy, B., Andrews, T., Savage, E., Drummond, F. J., Walshe, N., ...& Hegarty, J. (2017). The effect of adult early warning systems education on nurses' knowledge, confidence, and clinical performance: A systematic review. *Journal of Advanced Nursing*, 73(11), 2506-2521.
- Scalese, R. J., Obeso, V. T., & Issenberg, S. B. (2008). Simulation technology for skills training and competency assessment in medical education. *Journal of General Internal Medicine*, 23(Suppl 1), 46-49.
- Su, W. M., & Juestel, M. J. (2010). Direct teaching of thinking skills using clinical simulation. *Nurse Educator*, 35(5), 197-204.
- Taenzer, A. H., Pyke, J. B., & McGrath, S. P. (2011). A review of current and emerging approaches to address failure-to-rescue. *Anaesthesiology*, 115(2), 421-431.
- Tanner, C. A. (2006). Thinking like a nurse: A research based model of clinical judgment in nursing. *Journal of Nursing Education*, 45(6), 204-211.
- Ten Cate, O., Snell, L., Carraccio, C. (2010). Medical competence: The interplay between individual ability and the health care environment. *Medical Teacher*, 32(8), 669-675. doi:10.3109/0142159X.2010.500897
- Thomson, C., & Dowding, D. (2002). *Clinical decision-making and judgement in nursing*. London: Churchill Livingstone.
- Zhang, Z., Luk, W., Arthur, D., & Wong, T. (2001). Nursing competencies: Personal characteristics contributing to effective nursing performance. *Journal of Advanced Nursing*, 33(4), 467-474.