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ORIGINAL RESEARCH

Self-Instructional Training Application on Diabetic Patients' Self-Care Behaviors

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Abstract

Background: Diabetes mellitus cases have significantly increased in Indonesia over recent years. Health education for patients has often been carried out; however, education using self-instructional methods, which provided self-learning to solve problems by adjusting the patient's ability to improve self-care behaviors, has not been widely used.
Purpose: This study aimed to analyze the self-care behaviors of diabetes mellitus patients with the application of self-instructional training.
Methods: This research was a quasi-experimental study with a non-equivalent pretest-posttest with a control group design. The participants were 73 diabetic patients in the out-patient units selected by a purposive sampling technique and divided into two groups: the intervention group (n=37), and the control group (n=36). The intervention group received a self-instructional training program, which was carried out in 2 sessions using a booklet; each session lasted for 45 minutes. The Summary of Diabetes Self-Care Activities (SDSCA) questionnaire was used to collect diabetic patients' self-care behavior data. Wilcoxon and Mann-Whitney tests were employed for data analysis.
Results: Self-care behaviors of patients with diabetes mellitus increased before and after the training in both groups (p=0.000). However, the increase in the intervention group was higher than that in the control group, from 46.46±5.014 to 58.03±7.320, and from 47.78±4.929 to 51.64±6.406, respectively. There was also a significant difference in the self-care behaviors of diabetes mellitus patients between the intervention group and the control group (p=0.000).
Conclusion: Self-instructional training significantly improves self-care behaviors of diabetes patients. Therefore, self-instructional training can be considered to apply in the clinical setting for improving self-care behaviors of diabetic patients to prevent complications, and for enhancing nursing care of diabetes mellitus.

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1. Introduction

Diabetes mellitus is a non-contagious chronic disease due to carbohydrate, fat, and protein metabolism disruption caused by the damage of pancreatic beta cells, insulin secretion, or tissue's inability of insulin utilization, which increases blood sugar levels (Grossmann, 2014). Many factors like obesity, low activity, high carbohydrate consumption, and genetic factors have contributed to the increased prevalence of diabetes mellitus (Zheng et al., 2017). Therefore, diabetes self-care behaviors need to be applied continuously to prevent further complications of the disease (Sharoni et al., 2016). In Indonesia, diabetes mellitus prevention and management programs have existed since 1993. Although there are many health education methods taken to improve patient self-care behaviors, such as diabetes self-management interventions and diabetes education through pattern management, the number of diabetes cases continues to increase (Soelistijo et al., 2015).

The International Diabetes Federation (IDF) shows that the global prevalence of diabetes in adults has been increasing over recent decades. There are 415 million people diagnosed with diabetes mellitus in the world in 2015, and the organization predicts that the disease will increase to 642 million in 2040 (International Diabetes Federation, 2015). The prevalence of diabetes mellitus around the world in 2014 was 8.3% or 387 million cases. In 2013, Indonesia ranked 7th as the largest number country of diabetes incidence with 5.8% of cases or around 8.5 million cases, which were dominated by women with 4.9 million cases and men with 3.6 million

cases (American Diabetes Association, 2014). The Indonesian health profile shows that the prevalence of diabetes mellitus in East Java is 2.6%. East Java is in the fifth rank of the highest number of diabetes mellitus in Indonesia (Ministry of Health Republic of Indonesia, 2018). Particularly for Kediri, there were 769 cases of diabetes mellitus from all Public Health Centers in Kediri in 2017 (Kediri City Health Office, 2017).

Diabetes mellitus is a lifelong disease condition that cannot be cured but can be controlled using drugs and managing lifestyle. Managing a healthy lifestyle for fulfilling social, emotional, and psychological needs and long-term care for patients are needed to prevent further disease complications (Lee et al., 2016). Diabetes mellitus with complications can be a cause of patient stress, social isolation, hopelessness, loss of self-esteem, decreased self-image, and lack of confidence. Therefore, diabetes mellitus with complications has become a big challenge, especially in developing countries (Fenwick et al., 2012). Hyperglycemia in diabetes will trigger both microvascular and macrovascular complications. Microvascular complications include retinopathy, neuropathy, and nephropathy, whereas macrovascular complications are coronary artery diseases (CAD), cerebrovascular diseases (CVA), and peripheral vascular diseases (PVD). Those microvascular and macrovascular complications will cause organ damage if they are improperly treated (Ghandour et al., 2018; Khan et al., 2010).

Patients with diabetes mellitus may have problems with self-care behaviors (Borhaninejada et al., 2016). The self-care behaviors of patients with diabetes mellitus consist of nutritional management, physical exercise, anti-diabetic drug therapy, education and blood sugar monitoring (Soelistijo et al., 2015). Patients with diabetes have limited management of emotions, belief abilities, diet, physical activity, blood sugar control, medication, and foot care (Nuari, 2017). Complications that occur in diabetes mellitus patients can affect all aspects of life and can be life-threatening if they do not immediately obtain proper treatments or monitoring. Nursing interventions are needed to increase self-reliance efforts in diabetes management procedures in everyday life (McNamara et al., 2010).

Research showed that the diabetes self-management education and support (DSMES) program had a positive impact on diabetes patients' ability to do self-care (Moses & Olenik, 2019). Furthermore, Ghoreishi et al. (2019) found that interventions of social cognitive theory-based education have a positive effect on diabetes self-care. Nursing interventions that focused on the pillars of diabetes mellitus management were absolutely needed. Therefore, nurses need to create some innovations in health education programs to improve diabetes self-care behaviors for better illness management and patients' health quality (Andriyanto et al., 2019).

Cognitive behavior therapy became one of the methods that can be used as an intervention to improve patients' self-care. Self-instructional training has become one approach of cognitive behavior therapy. Self-instructional training is an educational method with a learning approach to solve problems by adjusting to the patient's abilities. The aim of this intervention is to make patients learn about their self-care. It will increase their learning potency by reflecting on past experiences and concluding the best applicable self-care behavior (Hamdan et al., 2019). A previous study showed that the self-instructional training method decreased blood sugar in diabetes mellitus patients. Nevertheless, this self-instructional training method was not specific for diabetes mellitus self-care behavior improvement (Nuari, 2017). A preliminary study conducted by the researchers in one of the public health centers in Kediri showed that the self-care behaviors of diabetes mellitus patients were still suboptimal. Many researchers have carried out studies about the effect of education on improving self-management and knowledge, and decreasing blood sugar. However, research on self-instructional methods to improve diabetic self-care behaviors is still rarely conducted. Therefore, this study aimed to analyze the self-care behaviors of diabetes mellitus patients with the application of self-instructional training.

2. Methods

2.1 Research design

This research was a quasi-experimental study with a non-equivalent pretest-posttest design and with a control group.

2.2 Setting and samples

This study was conducted in a public health center in Kediri, Indonesia. There were 73 diabetic patients in the out-patient unit of this public health center. A purposive sampling technique was used to recruit the patients as the research subjects. These 73 samples matched with the inclusion criteria, including: 36-70 years old and able to read, and also matched with the exclusion criteria, namely patients with diabetic foot ulcer complications, visual impairment, and dementia. The samples were divided into two groups: the intervention group with 37 respondents, and the control group with 36 respondents.

2.3 Intervention

Self-instructional training is a training program that is carried out to change cognition by providing education so that a person is able to control or give instructions to himself. Learning objectives set for all respondents were evaluated at the end of the training program by a follow-up interview session. The self-instructional training program consisted of two main components: cognitive modeling and rehearsal self-instructional, which were carried out in two sessions. The education of the program was carried out by members of the research team who had received debriefing from the chief researcher prior to the data collection. Each respondent also conducted five sessions of independent learnings to implement the knowledge from the educational sessions. The intervention activities are presented in Table 1.

2.4 Measurement and data collection

In this study, the researchers modified the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire. The SDSCA questionnaire was created by Toobert et al. (2000) and developed by Choi et al. (2011), consisting of 9 items with a Cronbach's alpha of 0.69. From those 9 items, the researchers developed the questionnaire to 14 questions items which scored 0-7 for each item. This questionnaire contains the self-care ability of patients with diabetes mellitus, including diet (3 items), physical activity (3 items), foot care (5 items), treatment (1 item), and blood sugar control (2 items). The total score ranges from 0-84. The scoring system of the questionnaire consists of three categories: low (score 0-46), moderate (47-63), and high (64-84). The validity and reliability tests were carried out on 20 diabetes mellitus patients excluding from the research subjects. There was one invalid item out of 14 items to be excluded. Therefore, there were only 13 items in this questionnaire. The result of the validity and reliability test showed a value of sig r of <0.05 (item correlations >0.444) and r alpha value of 0.783, respectively.

The data were collected from August to December 2018, as follows: (1) selecting research subjects according to the inclusion criteria; (2) providing research information clearly to research subjects; (3) requesting respondents' consents to be the research subjects by providing an informed consent sheet; (4) determining the group of research subjects into two groups; (5) filling out the pre-test questionnaire to all respondents; (6) measuring the post-test after seven days of completing the self-instructional training method, which consisted of two training sessions with the researchers and five self-learning sessions through self-care observation guideline followed by an interview at the end of the training for the intervention group; and (7) measuring the post-test after seven days of receiving standard care for the control group. Standard care meant that the patients received education from the public health center, which was delivered verbally and there was no self-instructional training method. After the research was done, the control group were given the self-instructional training method. The procedures to collect data in this study are presented in Figure 1.

2.5 Data analysis

Data analysis was carried out through some stages: (1) editing to check the completeness of the data, (2) coding, (3) entry, and (4) tabulating (inserting data into tables). Univariate analysis was carried out on categorical variables such as age, gender, level of education, and jobs which were presented on proportion. The homogeneity was tested using the Chi-square test. Bivariate analysis was carried out for data processing using computer software statistical tests. The data normality of self-care behavior by the Shapiro Wilk test showed that the data were not normally distributed. The Wilcoxon test was used to analyze the data before and after the intervention, while the Mann-Whitney test was used to compare the intervention and the control groups.

Table 1. The activities of the self-instructional training program

Session	Activities	Media	Description
Day 1 (session 1)	*Cognitive modeling (45 minutes)*	Booklet	- Researchers identified the knowledge, abilities, and self-confidence for self-care of diabetes patients. - Researchers and respondents made agreements for learning and changing negative thoughts to positive thoughts. - Researchers provided the respondents with education including definition, symptoms, complications, and diabetes mellitus management.
Day 2			- Respondents learned independently.
Day 3 (session 2)	*Cognitive and behavioral rehearsal of self-instruction (40 minutes)*	Booklet	- Researchers provided foot care education, prevention of acute complications, and foot exercises by demonstrating directly, which were followed by respondents. - Researchers and respondents formulated goals and follow-up plans to treat their diabetes. - Respondents were able to determine solution options to overcome the problems they experienced while suffering from diabetes mellitus. - Respondents stated they would carry out self-care behaviors that they had learned according to their needs.
Day 4-7		Self-care observation guideline	- Respondents learned independently
Day 7	*(20 minutes)*	Self-care observation guideline	- Researchers conducted follow-ups on respondents about their knowledge and abilities in self-care - Researchers provided self-reinforcement to respondents who did self-care and successfully overcome problems during their diabetes treatment.

2.6 Ethical considerations

This research protocol had been approved by the Health Research Ethics Committee of Institut Ilmu Kesehatan Bhakti Wiyata Kediri (reference number of 705/PP2M-KE/VIII/2018). Before conducting the study, the researchers explained the purpose of the study, the procedures for data collection, and the benefits of participation to the potential subjects. The participants were offered an opportunity to ask any questions, and were assured that they could withdraw from the study at any time. All participants signed a written informed consent form to participate in the study. Their personal information was kept confidential.

3. Results

3.1 Characteristics of respondents

The respondents' characteristics in this study, including age, gender, education, and work profession were not statistically different between the two groups (p>0.05). Table 2 shows that the majority of the respondents in both groups were at the age of 46-65 years old, female, having low education, and not working or retiring.

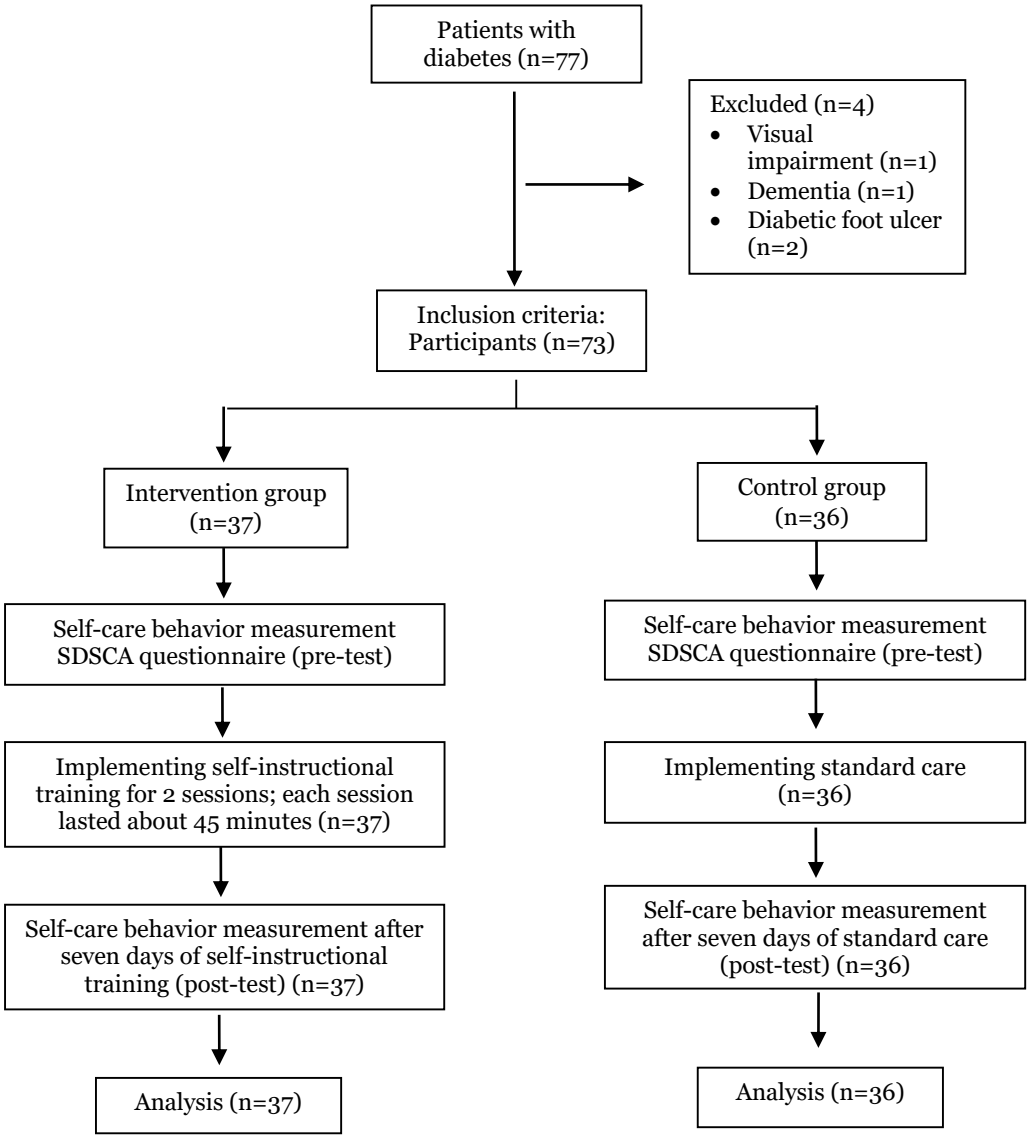

Figure 1. Flowchart of the study

The characteristics of the respondents is presented in Table 2, as follows:

Table 2. Characteristics of respondents (n=73)

Variables	Intervention Group (n=37)		Control group (n=36)		*p*
	f	%	f	%	
Age (years)					
26-45	6	16.2	7	19.5	0.926*
46-65	23	62.2	21	58.3	
>65	8	21.6	8	22.2	
Gender					
Male	11	29.7	10	27.8	0.854*
Female	26	70.3	26	72.2	
Education					
Low (≤ junior high school)	28	77.8	29	80.6	0.614*
High (senior high school or more)	9	22.2	7	19.4	

*Chi-square test

Table 2. Continued

Variables	Intervention Group (n=37)		Control group (n=36)		*p*
	f	%	f	%	
Job					
Not working or retiring	27	75	24	66.7	0.739*
Working	10	25	12	33.3	

*Chi-square test

3.2 Comparisons of self-care behaviors

The self-care behaviors of diabetes mellitus patients before the self-instructional training were mainly low in both groups, with a higher proportion in the intervention group (64.9%) rather than in the control group (61.1%). The self-care behaviors of the patients after the self-instructional training were mostly in the moderate category (48.7%) in the intervention group compared to the control group, which were mostly in the low category (50 %). There were significant differences in self-care behaviors before and after the intervention in both groups (*p*=0.000) (Table 3).

Table 3. Comparisons of self-care behaviors before and after the self-instructional training within groups (n=73)

Self-care Category	Intervention (n=37)		*p*	Control (n=36)		*p*
	Before f (%)	After f (%)		Before f (%)	After f (%)	
Low	24 (64.9)	4 (10.8)	0.000*	22 (61.1)	18 (50)	0.000*
Moderate	13 (35.1)	18 (48.7)		14 (38.9)	16 (44.4)	
High		15 (40.5)			2 (5.6)	

* Wilcoxon test

The self-care behaviors of patients with diabetes mellitus increased before and after the training in both groups (*p*=0.000); however, the increase in the intervention group was higher than that in the control group, from 46.46±5.014 to 58.03±7.320 and from 47.78±4.929 to 51.64±6.406, respectively. There was a significant difference in the self-care behaviors after the training between the intervention and control groups (*p*=0.000). It can be concluded that there was an effect on self-care behaviors of patients with diabetes mellitus with an application of self-instructional training (Table 4).

Table 4. The differences in self-care behaviors between intervention and control group (n=73)

Variable	Intervention (n=37)	Control (n=36)	*p*
	Mean±SD	Mean±SD	
Self-care behaviors before self-instructional training	46.46 ± 5.014	47.78 ± 4.929	0.306*
Self-care behaviors after self-instructional training	58.03 ± 7.320	51.64 ± 6.406	0.000*

*Mann-Whitney test

4. Discussion

The purpose of this study was to evaluate the effect of a self-instructional training method on improving the self-care behaviors of patients with diabetes mellitus. The finding of this study indicated that the self-instructional method affected the increased self-care behaviors of diabetes mellitus patients. This finding is similar to a previous study reporting that the provision of health education with self-instructional modules could improve the knowledge of type 2 diabetes patients (Oktorina et al., 2019). The finding is also supported by some studies stating

that self-instructional training can reduce blood sugar levels in patients with type 2 diabetes mellitus, and improve patient understanding of learning about self-care (Miljkovic et al., 2015; Nuari, 2017). The self-instructional training strengthens the understanding of patients with diabetes mellitus, in which this understanding can improve self-care behaviors in order to solve their problems and guide patients to live healthy for their better quality of life (Rivera-Flores, 2015).

Increasing knowledge in patients with diabetes mellitus is expected to form positive behaviors by doing a self-teaching method so that self-care can be improved. Diabetes self-care behaviors that can be applied by diabetic patients include the easy exercises of physical activity, dieting, controlling blood glucose levels, behavior treatment, and prevention of complications. Doing self-care well and regularly has a positive impact on the quality of life because there are efforts to control blood glucose levels and prevent complications (Amelia et al., 2018). According to the Orem's theory, self-care behavior is an implementation of activities carried out by individuals themselves to meet their needs that can sustain life and health (Alligood, 2014).

Self-instructional training could increase the self-care behaviors of patients and improve their physical and mental health. Patients with diabetes mellitus who perform self-care can reduce the incidence of diabetes complications. Therefore, it is expected to motivate patients to perform diabetes self-care (Ghoreishi et al., 2019). Moreover, the self-instructional training method can enhance patient awareness by changing negative into positive thoughts that can increase discipline in the implementation of self-care (Mahatmaharti et al., 2019). The results of research on the development of enhanced models of empowerment and quality of life of patients with type-2 diabetes showed that self-instructional training could improve the self-empowerment and quality of life of patients with type-2 diabetes mellitus. The self-instructional method can be used by nurses in providing health education to the patients to increase their self-control ability. So, patients are able to choose healthy alternatives in the management of diabetes mellitus, and finally could also improve their quality of life (Nuari, 2016).

The self-instructional method was developed by Meichenbaum (1997). It is a training method that is carried out to change one's cognition by providing education so that a person will be able to control or instruct oneself to change behaviors (Nawantara, 2018). Increased self-care behaviors of diabetes mellitus patients can occur because of the improved level of understanding of how to implement self-care after the self-instructional method. Knowledge improvement is expected to contribute to the management of patients with diabetes mellitus (Patel et al., 2015).

5. Implication and limitation

This study provides insights into how self-instructional training affects diabetes mellitus self-care behaviors. As a result, health care providers for diabetes mellitus in the clinical setting are able to adopt self-instructional training in order to improve daily living self-care behaviors. The improvement in self-care behaviors is expected to decrease patient's long-term complications due to improper self-care behaviors.

This study has some limitations. First, the education with self-instructional methods varied among respondents because it was adjusted to the abilities and knowledge of each respondent. However, the same learning objectives were set to all respondents for evaluation in the follow-up interview and the use of observation guideline sheets were done to minimize the bias due to various behaviors during the intervention. Second, the self-instructional method was carried out for 7 days, including both assisted-learning sessions by different facilitators and independent learning sessions by the respondents, requiring big efforts and laborious time to complete the data collection. This may result in different knowledge and abilities in self-care behaviors among respondents. However, follow-up sessions for evaluation were held at the end of the self-instructional training program to ensure that all respondents had the same knowledge and abilities according to the learning objectives.

6. Conclusion

Although the self-care behaviors of diabetes mellitus patients increased in both groups, the increase in the intervention group was higher than that in the control group. Self-instructional training improves diabetes mellitus patient's self-care behaviors; therefore, it is recommended for the health care providers, especially nurses in the clinical setting to apply this training

method. For further research, educational sessions on self-instructional methods may be added to optimize the intervention.

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Author contribution

SW: Study design, conceptualization, data collection, data analysis, manuscript writing; CDP: study design, data collection; WNP: study design, manuscript writing; KA: data collection.

Conflict of interest

The authors declare no conflict of interest in this study.

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ORIGINAL RESEARCH

The Content Validity and Interrater Reliability of Nursing Outcome Classification Self-Care for Toileting among Children with Physical Disabilities

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Abstract

Background: Nursing Outcome Classification (NOC) Self-care for Toileting is an instrument for measuring the abilities of toileting self-care among children with physical disabilities. However, there has been no cultural adaptation in the Indonesian context, especially among children with physical disabilities, so that the validity and inter-rater reliability of the instrument has not been reported. Testing the content validity and interrater reliability of this instrument is necessary so that it could be used to measure the ability of toileting self-care.
Purpose: This study aimed to examine the content validity and inter-rater reliability of NOC Self-care for Toileting among children with physical disabilities.
Methods: This was a descriptive quantitative non-experimental research with a cross-sectional design. In the content validity test, this study employed seven experts teaching in nursing academies with a minimum degree of S2/specialist and had the experiences in basic nursing to assess the validity of NOC Self-care for Toileting. As for the inter-rater reliability test, this study involved two raters of nursing students who have passed block 2.4 lecture on "Growth and Development" and 36 children with physical disabilities at a Special School in Bantul, Yogyakarta. The validity test was analyzed using CVR, CVI, and Aiken's V indexes, while the inter-rater reliability test was analyzed using Kappa and percent agreement.
Results: The validity test showed the CVR value range of 0.71-1.00, the CVI value of 0.91, and the V coefficient range of 0.86-1.00. In the inter-rater reliability test, the Kappa value obtained was 0.958, and the percent agreement value was 97.22% for all indicators of NOC Self-care for Toileting.
Conclusion: NOC Self-care for Toileting is a valid and reliable instrument for measuring the abilities of toileting self-care among children aged 6-18 with mild to moderate degrees of physical disabilities. Further research can be conducted by involving different respondents and cultures with more than two raters if possible.

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1. Introduction

Based on the 2010 population and prevalence estimates from the World Health Survey and Global Burden of Disease, there were around over a billion children (or about 15% of the world's population) that were estimated to be living with disability; Global Burden of Disease estimates childhood disability prevalence to be 95 million (5.1%) children, of whom 13 million (0.7%) have a severe disability (World Health Organization and World Bank, 2011). The proportion of children with disabilities in Indonesia is 2.5% for children of 5-9, 3.5% for children of 10-14, and 4.2% for children of 15-17 years old (Ministry of Health Republic of Indonesia, 2018). The 2017/2018 report from the Department of Education, Youth, and Sports *(Disdikpora)* of the Special Region of Yogyakarta (DIY) revealed that the number of physical disability students in Special Schools *(SLB)* in the Special Region of Yogyakarta was 231; the majority of these students lived in Bantul Regency with a total of 107 children (Department of Education, Youth, and Sports, 2018).

According to Noble (2014), children with physical disabilities often experience difficulties in toileting activities. These difficulties include moving and positioning in the toilet, so that a special seat is needed for them to move. They also have difficulties taking off their bottoms, resulting in

incontinence, cleaning themselves after toileting, and closing zippers. According to the American Academy of Pediatrics (2012), the number of physical disabilities and illnesses can hinder a child's ability to become fully toilet-trained or easily adjust to bathroom use; children with visual disabilities and those with sight deficiencies experience a disadvantage at several stages of toilet training, and children who are deaf or have difficulty hearing may or may not find toilet training challenging, depending on their ability to communicate. Children with cerebral palsy not only tend to be slow in developing bladder control but may not have enough bladder awareness to begin toilet training at the age of two or three; limited physical activity, undeveloped muscle tone, or medications tend to cause constipation for children with cerebral palsy. Children and teens with disabilities may have urinary and/or fecal incontinence for a wide variety of reasons, including weak muscles and/or interruptions or delays in the signals to the brain that a person needs to void (Macias et al., 2006). For students with disabilities, this can include a lack of awareness that they need to use the restroom until it is too late (National Association for Continence, 2013).

Toileting self-care abilities can be measured using Nursing Outcome Classification (NOC) Self-care for Toileting. NOC is an instrument to measure client status before and after the nursing intervention. The outcome helps evaluate the effectiveness of an intervention given independently or in collaboration with nurses (Moorhead et al., 2013). Each outcome has a definition, a measurement scale, a list of indicators related to the concept and supporting references. NOC Self-care for Toileting is defined as a person's actions to go to the toilet independently with or without the aid of a device measured using 13 indicators with a 5-point Likert scale from severely compromised to not compromised (Moorhead et al., 2013).

It is important to consider the validity and reliability of data collection tools (instruments) when either conducting or critiquing research (Heale & Twycros, 2015). The higher the value of the validity and the reliability of an instrument, the more accurate the data obtained from a study would be (Hayati & Lailatussaadah, 2016). The NOC Self-care for Toileting instrument has been proven to be valid and reliable in the United States and Korea (Keenan et al., 2003; Lee, 2007). In Indonesia, this instrument has been tested for its inter-rater reliability in the population of stroke patients in the hospitals with a kappa value of 0.9347 and a percentage agreement value of 96.3% (Khasanah et al., 2018). If an instrument is developed worldwide in many languages, the translation and adaptation of the culture to new languages and countries are very relevant (Ljungberg et al., 2015). Furthermore, da Silva et al. (2015) stated that NOC was created in America and written in English. Therefore, cultural adaptation is needed before the indicators and results of nursing are used in overseas health services and education. In this regard, the researchers claim that there has been no cultural adaptation of NOC Self-care for Toileting in the Indonesian context. Until now, a tool to measure toileting abilities, namely NOC Self-care for Toileting, has not been proven to be used and has not been reported for the validity and inter-rater reliability, especially among children with physical disabilities. Accordingly, this study aimed to examine the validity and inter-rater reliability of NOC Self-care for Toileting among children with physical disabilities.

2. Methods

2.1 Research design

This was a descriptive quantitative non-experimental research with a cross-sectional design.

2.2 Setting and samples

This study was conducted in the Special School in Bantul, the Special Region of Yogyakarta, Indonesia, from October to November 2018. The population was students with physical disabilities. The samples were 36 children with physical disabilities who met the inclusion criteria, including: (1) in the age of 6-18, (2) not menstruating, (3) not having diarrhea or constipation, and (4) not taking laxative medications. The exclusion criteria were children who were not willing to be the respondents and those with multiple disabilities (having more than one disability, for example, deaf-speech impairment, deaf-blind, and physical disabilities-blind).

The content validity of the NOC Self-care for Toileting was validated by seven experts. The researchers recruited the experts who taught in nursing academies with a minimum degree of S2/Specialist and had experiences in basic nursing. The researchers gave the content validity assessment guide sheet, the NOC Toileting Self Care rubric, and the content validity assessment

sheet to the experts simultaneously to fill out the content validity assessment of the NOC Self-care for Toileting. The inter-rater reliability test was conducted by two raters (assessors) of nursing students who had passed block 2.4 lecture on "Growth and Development." Two raters directly observed the respondents' self-care ability according to the rubric on the indicators of NOC Self-care for Toileting.

2.3 Measurement and data collection

The NOC Self-care for Toileting was used to measure toileting self-care. This instrument consisted of 13 indicators with 5 levels of assessment criteria, namely: (1) severely compromised, (2) substantially compromised, (3) moderately compromised, (4) mildly compromised, and (5) not compromised. In each assessment criterion (see Appendix 1), there was an operational definition written in the rubric of the instrument adapted from Khasanah et al. (2018).

The cultural adaptation of NOC Self-Care for Toileting was done based on the translation model for cross-cultural adaptation of instruments (Jones et al., 2001; Lee et al., 2009; Sousa & Rojjanasrirat, 2011). First, NOC Self-care for Toileting instrument was translated from the original language (English) into Indonesian by two different translating institutions. NOC Self-care for Toileting translated by the first translating institution was called translation 1 (T1), and the other one by the second translating institution was called translation 2 (T2). After the instrument was translated, the researcher asked for inputs from the Indonesian literary experts and the advisor concerning the results of the translation of the instrument to obtain the final version of the translation (T12). After the final version of the translation (T12) was agreed upon, a back-translation was done by a professional translating institution.

The next step was to test the content validity of the NOC Self-care for Toileting to seven experts. Meanwhile, the inter-rater reliability test was conducted by two raters (assessors). Before the data were collected, the researcher conducted training and formal meetings with the raters to increase the agreement. The data collection began with explaining and asking about the willingness to be research respondents represented by the respondents' parents. If the children, represented by the parents, were willing to serve as respondents, the parents would be asked to sign the informed consent and fill in the respondents' data. During the data collection, two raters directly observed respondents' self-care ability according to the rubric on the indicators of NOC Self-care for Toileting. Then the two raters conducted the assessment independently at the same time on the sheet provided by the researcher according to each rater's perception.

2.4 Data analysis

The content validity was analyzed using the CVR (Content Validity Ratio), CVI (Content Validity Index), and Aiken's V indexes. The CVR is an item statistic useful for rejection or retention of individual items and is internationally recognized as the method for establishing content validity (Wilson et al., 2012). CVI can be used to rate each instrument item in terms of its relevance to the construct. The CVI is CVR mean for all retained items (Hadzaman et al., 2018). When all panelists say that the tested knowledge or skill is "essential," or when none say that it is "essential," we are confident to include or delete the item. It is when there is no consensus that item issues arise. Two assumptions are made, each of which is consistent with the established psychophysical principles. The CVR and CVI values obtained were analyzed based on Lawshe (1975). The CVR values are in the range of -1 to 0 (not good), 0 (good), and 0 to 1 (very good) (Lawshe, 1975). The values of V coefficient were interpreted based on Guilford and Fruchter (1978) as follows: 0.80-1.00 (very high), 0.60-0.80 (high), 0.40-0.60 (medium), 0.20-0.40 (low), 0.00-0.20 (very low), and <0.00 (invalid). The interrater reliability was analyzed using Kappa and percent agreement for two raters (Cohen, 1960; Shweta et al., 2015). The degree of agreement of the Kappa value was analyzed based on the Altman benchmark scale as the following: <0.20 (poor), 0.21-0.40 (fair), 0.41-0.60 (moderate), 0.61-0.80 (good), and 0.81-1.00 (very good) (Gwet, 2014). The Kappa value is accepted if >0.41 (McHugh, 2012). The values of percent agreement value were also interpreted based on McHugh (2012) that the percent agreement can be accepted if the value is more than 80%.

2.5 Ethical considerations

The ethical eligibility of this study was obtained from the Ethics Committee, the Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada (Ref: KE/FK/0760/EC/2018).

In the data collection process, the researcher explained the aims and objectives of the research to the parents and asked the children's willingness to be the respondents. Parents who agreed to participate in the study completed the informed consent as a sign of consent to participate in the study.

3. Results

3.1 Characteristics of respondents

As presented in Table 1, the total number of respondents in this study was 36 with ages ranging from 6 to 18 years. Most children were aged in the group of 10-13 (44.4%) and 14-18 (44.4%) and experienced a moderate degree of disability (86.1%). Based on the gender, the number of boys and girls was similar (50% each).

Table 1. The frequency distribution of respondent characteristics (n=36)

Demographic	f	%
Gender		
Male	18	50
Female	18	50
Age (years old)		
6-9	4	11.1
10-13	16	44.4
14-18	16	44.4
Degree of disability		
Mild	5	13.9
Moderate	31	86.1
Severe	0	0

3.2 Translation and cultural adaptation process of NOC Self-care for Toileting

The translation process of the NOC Self-care for Toileting adopted the theory of cross-cultural adaptation of Brislin (Jones, 2001; Lee et al., 2009; Sousa & Rojjanasrirat, 2011). The translation from the original language (English) to Indonesian was carried out by two professional translation agencies. The results of the Indonesian translation from the two professional translation institutions were then discussed by the Indonesian language and literature experts and research supervisors as input providers. The input providers compared the translation results from the two language institutions and made necessary adjustments to the Indonesian language and cultures.

After receiving input from the Indonesian language and literature experts and research supervisors, a final version of the instrument translation (translated synthesis) was obtained. One final version of the Indonesian language instrument translation that had been agreed upon was then further processed for back-translation in a different professional translation agency. After the back translation was carried out, the researchers with the English language and literature experts compared the back-translated instrument with the original English instrument.

3.3 The results of the validity test of NOC Self-care for Toileting

In the validity test of each NOC Self-care for Toileting indicator, the CVR values were in the range of 0.71-1.00. According to Lawshe (1975), the values fall within the very good category. The CVI value was 0.91, so it showed a very good validity value (Lawshe, 1975). Based on the Aiken's V approach, the values of V coefficient were in the range of 0.86 to 0.96 which fall within the very high category (Guilford & Fruchter, 1978). The assessment results of the content validity of the CVR and Aiken's V can be seen in Table 2.

3.4 The results of the interrater reliability test of NOC Self-care for Toileting

In the inter-rater reliability test of all NOC Self-care for Toileting indicators, the Kappa value obtained was 0.958. This value showed a very good degree of agreement (Gwet, 2014). The Kappa value was accepted since it exceeds the minimum limit (0.41) (McHugh, 2012). The NOC Self-care for Toileting produced the percent agreement value of 97.22%, so NOC Self-care for Toileting could be accepted as it exceeded the minimum limit of percent agreement value of 80% (McHugh, 2012). In the inter-rater reliability test, each indicator of NOC Self-care for Toileting produced the Kappa value in the range 0.86-1.00. The Kappa values of the 13 indicators showed a very good

degree of agreement (Gwet, 2014) and were accepted since the values exceeded the Kappa value limit of 0.41 (McHugh, 2012). The percent agreement value for each NOC Self-care for Toileting indicator was in the range of 91.67-100%. The value was accepted, for it had exceeded the minimum limit of percentage agreement value of 80% (McHugh, 2012). The results of the inter-rater reliability test of NOC Self-care for Toileting can be seen in Table 3.

Table 2. The assessment results of the content validity of the CVR and Aiken's V (expert=7)

No	Indicator	CVR	Interpretation	V	Interpretation
1	Responds to full bladder in timely manner	1.00	Very Good	0.93	Very High
2	Responds to urge to have a bowel movement in timely manner	1.00	Very Good	0.93	Very High
3	Gets in and out of bathroom	0.71	Very Good	0.86	Very High
4	Removes clothing	1.00	Very Good	0.96	Very High
5	Positions self on toilet or commode	1.00	Very Good	0.96	Very High
6	Gets to toilet between urge and passage of urine	0.71	Very Good	0.93	Very High
7	Gets to toilet between urge and evacuation of stool	0.71	Very Good	0.93	Very High
8	Empties bladder	1.00	Very Good	0.90	Very High
9	Empties bowel	1.00	Very Good	0.90	Very High
10	Wipes self after urinating	1.00	Very Good	1.00	Very High
11	Wipes self after bowel movement	1.00	Very Good	1.00	Very High
12	Gets up from toilet or commode	0.71	Very Good	0.86	Very High
13	Adjust clothing after toileting	1.00	Very Good	0.96	Very High

Table 3. The results of the inter-rater reliability test (n=36)

No	Indicator	Percent Agreement	Interpretation	Kappa	Degree of Agreement	Kappa Interpretation
1	Responds to full bladder in timely manner	94.44%	Accepted	0.910	Very Good	Accepted
2	Responds to urge to have a bowel movement in timely manner	100%	Accepted	1.00	Very Good	Accepted
3	Gets in and out of bathroom	97.22%	Accepted	0.955	Very Good	Accepted
4	Removes clothing	100%	Accepted	1.00	Very Good	Accepted
5	Positions self on toilet or commode	94.44%	Accepted	0.909	Very Good	Accepted
6	Gets to toilet between urge and passage of urine	94.44%	Accepted	0.907	Very Good	Accepted
7	Gets to toilet between urge and evacuation of stool	100%	Accepted	1.00	Very Good	Accepted
8	Empties bladder	100%	Accepted	1.00	Very Good	Accepted
9	Empties bowel	100%	Accepted	1.00	Very Good	Accepted
10	Wipes self after urinating	91.67	Accepted	0.881	Very Good	Accepted
11	Wipes self after bowel movement	100%	Accepted	1.00	Very Good	Accepted
12	Gets up from toilet or commode	91.67	Accepted	0.862	Very Good	Accepted
13	Adjust clothing after toileting	100%	Accepted	1.00	Very Good	Accepted

4. Discussion

This study aimed to examine the validity and inter-rater reliability of the NOC Self-care for Toileting among children with physical disabilities. The validity test showed the CVR value range of 0.71-1.00, the CVI value of 0.91, and the V coefficient range of 0.86-1.00. In the inter-rater reliability test, the Kappa value was 0.958, and the percent agreement was 97.22% for all indicators of the instrument. On the basis of the data from this study and other similar studies (Khasanah et al., 2018), this translation and cultural adaptation process results in a clearer and

more comprehensible wording of the indicators than that obtained by directly translating it from English into the Indonesia language without expert assessment.

Content validity can be defined as the ability of the selected items to reflect the variables of the construct in the measure (Zamanzadeh et al., 2015). Sireci and Faulkner-Bond (2014) defines content validity as the degree to which the content of a test is congruent with testing purposes. The results of this study indicated that the values of the content validity of NOC Self-care for Toileting among children with physical disabilities were very good and very high with the CVR values in the range of 0.71-1.00, the CVI value of 0.91, and the values of the coefficient V in the range of 0.86-0.96. Based on the explanation, it can be concluded that NOC Self-care for Toileting has been proven to be valid for measuring the abilities of toileting self-care among children with physical disabilities in Indonesia (Meisyarah et al., 2019). This confirms a research finding by Mulyani and Nurjannah (2019) about the content validity test of the NOC on Toileting Self-care among stroke patients, which produced an S-CVI value of 0.96-0.98, indicating that NOC Self-care for Toileting is valid to measure the abilities of NOC Self-care for Toileting among stroke patients in Indonesia.

A study in Korea showed that the mean Fehring ratio of the NOC Self-care for Toileting was 0.82, indicating that the tool had acceptable nursing sensitivity in Korea (Lee, 2007). A study conducted by Head et al. (2003) also revealed a similar finding regarding the outcome content validity of NOC Self-care for Activities of Daily Living (ADL) by the community health nurses, resulting in an outcome content validity score of 0.8429 and outcome sensitivity validity score of 0.7082. Thus, the results supported the content validity and nursing sensitivity of the study outcomes. Almeida et al. (2010) reported that NOC Self-care for Activities of Daily Living (ADL) was validated by experts. The study regarding toileting as indicator of NOC self-care for activities of daily living (ADL) showed a weighted average (0.76).

Based on Asaad (2004), several factors that can affect the validity include the internal factors of items (unclear direction of items, unstructured vocabulary and sentences, item length, and ambiguity of items), administrative factors and item scores, and nature and group criteria. In this regard, the researchers have considered these factors in this study. Therefore, all NOC Self-care for Toileting indicators produce very good validity values with the CVR values in the range of 0.71-1.00, the CVI value of 0.91, and the coefficient V values in the range of 0.86-1.00.

The inter-rater reliability test showed that the Kappa value and percent agreement fall within the very good category with the Kappa value of 0.958 and the percent agreement of 97.22%. Based on this explanation, the NOC Self-care for Toileting has proven to be reliable to measure the abilities of Toileting Self-care among children with physical disabilities in Indonesia (Meisyarah et al., 2019). A study by Khasanah et al. (2018) concerning the inter-rater reliability test for NOC Self-care for Toileting among stroke patients also showed a Kappa value of 0.934 and a percentage agreement of 96.3%.

A research carried out by Keenan et al. (2003) on the inter-rater reliability test for NOC Self-care for Toileting in a home care setting in the United States also revealed similar results with percent close to the agreement value of 95%. A study by McHugh (2012) revealed that perfect Kappa value is rarely achieved; however, in this study, several indicators could produce perfect Kappa and percent agreement values (k=1.00 and percent agreement=100%). Of the 13 Toileting Self-care indicators, seven indicators have perfect Kappa and percent agreement values (k=1.00 and percent agreement=100%). The perfect Kappa value (k=1) and the percent agreement value (100%) were shown in the indicators of (2) responds to urge to have a bowel, (4) removes clothing, (7) gets to toilet between urge and evacuation of stool, (8) empties bladder, (9) empties bowel, (11) wipes self after bowel movement, and (13) adjust clothing after toileting. The high value of kappa and percent agreement in this study shows the suitability. Several factors can influence the high Kappa and percent agreement values to obtain good inter-rater reliability values.

Several factors must be considered by instrument designers to increase the potential of an agreement (Burns, 2014; Graham et al., 2012; Kane et al, 2015; Mueller, 2018; Nurjannah et al., 2017; Ragupathi & Lee, 2020). The first factor is rater training. According to Graham et al. (2012), the duration of rater training is also important, and effective rater training requires more than one or two hours. In this study, the researcher conducted training for two raters for four hours in two sessions. In the first session, the researchers explained the data collection procedures and NOC Self-care for Toileting observation sheet to be used and directed perceptions between the

raters regarding the NOC Self-care for Toileting observation sheet for two hours. In the second session, the researcher with two raters conducted a simulation of data collection for two hours.

The second factor is rater selection. According to Graham et al. (2012), the expertise and experience of raters that suit the instruments can increase agreement. Based on a study carried out by Kane et al. (2015), raters' professional background can influence inter-rater reliability. This study employed two raters who have the same educational background, experience, and expertise. Both of them have passed block 2.4 lecture on "Growth and Development" so that it is easy to increase the inter-rater agreement.

The third factor is the accountability of raters' assessment. Based on Graham et al. (2012), rater training does not guarantee the consistency of the assessment conducted by raters, so that re-training is needed. In this study, the researcher always monitored the performance of the two raters and asked them if there were things still not understood. The researcher also reminded them to assess independently so that the results obtained are truly reliable and not biased.

The fourth factor is the instrument rubric design. Graham et al. (2012) stated that the consistency of raters' assessment can be influenced by the instrument rubric design. According to Ragupathi and Lee (2020), rubrics offer the possibility of objective, consistent evaluation minimizing the difference in grades even when multiple raters are involved in the evaluation. In this study, the rubric used was an adaptation of the NOC Self-care: Toileting rubric by Khasanah et al (2018) with modifications and adjustments regarding the samples. This instrument is accompanied by an operational definition of each indicator and has been given a detailed assessment rubric for each indicator scale from severely compromised to not compromised. In addition, this rubric has been validated by seven experts in their field of expertise and produced very good CVR and CVI values and very high V coefficient values.

The fifth factor is the type of scale in the instrument. The best rubrics have three to five descriptive levels to allow for discrimination in the evaluation (Mueller, 2018). This research used NOC Self-care for Toileting observation sheet with 5 scales, namely severely compromised, substantially compromised, moderately compromised, mildly compromised, and not compromised, so that it has more varied scales.

The sixth factor is to consider fatigue when scheduling inter-rater reliability test time. Raters' fatigue may increase errors (Burns, 2014). According to Aslett (2006), rater fatigue can affect the results of instrument reliability. Nurjannah et al. (2017) revealed that a rater who conducts an assessment outside of working hours until exhaustion might affect the stability of the assessment. Researchers scheduled the interrater reliability test time in the morning when they were still fit, and data collection was carried out one to two times a week with a duration of 10-15 minutes for each respondent so that the fatigue factor did not really have an impact on this study.

5. Implication and limitation

The NOC Self-care for Toileting instrument, according to the results of the present study, is a valid and reliable instrument for measuring the abilities of toileting self-care among children aged 6-18 with mild-moderate degrees of physical disabilities; therefore, the evaluated NOC indicators ensure good reproducibility in clinical practice. Nurses can use this instrument to measure the ability of toileting self-care among children with physical disabilities in clinical practice so that nurses can provide good nursing care. The NOC Self-care for Toileting instrument can also be used in Indonesia because the cultural adaptation in Indonesia has been carried out in this study.

The limitations of this study include data collection techniques for four indicators of defecation in NOC Self-care and the back-translation process that only used one professional translation agency. Despite these limitations, this study offers seven experts who validated the NOC Self-Care for Toileting instrument and conducted direct observations to assess interrater reliability using two raters. The results of this study can help nurses or caregivers in assessing toileting abilities in the community and clinically using the NOC Self-Care Toileting instrument appropriately.

6. Conclusion

The overall content validity values of NOC Self-care for Toileting among children with physical disabilities are included in the very good and valid category, while the overall inter-rater reliability values are included in the very good and reliable category. The use of NOC Self-care for

Toileting in this study has been adapted to the Indonesian culture. Thus, the Indonesian version of NOC Self-care for Toileting can be used to measure the toileting self-care among children with physical disabilities in Indonesia. Further research can be carried out by involving more than two raters if possible and conducting research on respondents and different cultures.

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Author contribution

YHM: Study conception and design, data collection, data analysis and interpretation, drafting article; SH: Study conception and design, data collection, data analysis and interpretation, drafting article; FH: Study conception and design, and drafting article

Conflict of interest

The authors declare that there was no conflict of interest in this study.

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Appendix 1
The adaptation and modification of NOC Self-care for Toileting instrument (Khasanah et al., 2018)

Code	Indicator	Indicator Operational Definition
031001	Responds to full bladder in timely manner	1: Unable to respond to the urge to urinate characterized by inappropriate urination 2: Able to respond the urge to urinate but cannot reach the bathroom 3: Able to respond to the urge to urinate but cannot reach the toilet 4: Able to respond to the urge to urinate and can reach the toilet but has not been able to position the body in the toilet when urinating 5: Able to respond to the urge to urinate by urinating in the toilet
030302	Responds to urge to have a bowel	1: Able to respond to the urge to defecate in time 2: Able to respond the urge to defecate but cannot reach the bathroom 3: Able to respond to the urge to defecate but cannot reach the toilet 4: Able to respond to the urge to defecate and can reach the toilet but has not been able to position the body in the toilet when defecating 5: Able to respond to the urge to defecate in the toilet
031013	Gets in and out of bathroom	1: Unable to perform all indicators: a) walking to the bathroom, b) opening the bathroom door, c) closing the bathroom door, d) walking from the bathroom 2: Able to perform 1 of 4 indicators: a) walking to the bathroom, b) opening the bathroom door, c) closing the bathroom door, d) walking from the bathroom 3: Able to perform 2 of 4 indicators: a) walking to the bathroom, b) opening the bathroom door, c) closing the bathroom door, d) walking from the bathroom 4: Able to perform 3 of 4 indicators: a) walking to the bathroom, b) opening the bathroom door, c) closing the bathroom door, d) walking from the bathroom 5: Able to perform all indicators: a) walking to the bathroom, b) opening the bathroom door, c) closing the bathroom door, d) walking from the bathroom
031004	Removes clothing	1: Unable to perform all indicators: a) opening buttons or zippers, b) taking off the skirt/outer pants, c) taking off the underwear, d) adjusting the clothes before urinating/defecating 2: Able to perform 1 of 4 indicators: a) opening buttons or zippers, b) taking off the skirt/outer pants, c) taking off the underwear, d) adjusting the clothes before urinating/defecating 3: Able to perform 2 of 4 indicators: a) opening buttons or zippers, b) taking off the skirt/outer pants, c) taking off the underwear, d) adjusting the clothes before urinating/defecating 4: Able to perform 3 of 4 indicators: a) opening buttons or zippers, b) taking off the skirt/outer pants, c) taking off the underwear, d) adjusting the clothes before urinating/defecating 5: Able to perform all indicators: a) opening buttons or zippers, b) taking off the skirt/outer pants, c) taking off the underwear, d) adjusting the clothes before urinating/defecating
031005	Positions self on toilet or commode	1: Unable to position themselves on the toilet or elimination aids 2: Able to position themselves on the toilet or elimination aids with the assistance of others 3: Able to position themselves on the toilet or elimination aids with assistive devices (for example: hand rail) 4: Able to position themselves on the toilet or elimination aids independently without any assistive devices and the assistance of others but need direction or supervision 5: Able to position themselves on the toilet or elimination aids independently without any directions or supervisions, assistive devices, and the assistance of others

Code	Indicator	Indicator Operational Definition
031014	Gets to toilet between urge and passage of urine	1: Unable to reach the toilet between the urge to urinate and before the release of urine with the assistance of others and a wheelchair 2: Able to reach the toilet between the urge to urinate and the release of urine with a wheelchair 3: Able to reach the toilet between the urge to urinate and the release of urine independently with the assistance of others 4: Able to reach the toilet between the urge to urinate and the release of urine independently with assistive devices (for example, walking aids, such as crutches or walker) 5: Able to reach the toilet between the urge to urinate and the release of urine independently
031006	Empties bladder	1: Unable to release urine 2: Able to release urine with medication 3: Able to release urine with stimulation 4: Able to release urine with directions (for example, direction to push) 5: Able to release urine independently (without any directions and stimulation)
031011	Empties bowel	1: Unable to evacuate stool 2: Able to evacuate stool with medication 3: Able to evacuate stool with stimulation 4: Able to evacuate stool with directions (for example, direction to push) 5: Able to evacuate stool independently (without any directions and stimulation)
031007	Wipes self after urinating	1: Unable to perform all indicators: - Male: a) taking water with a water dipper, b) washing the testicular area, c) washing the scrotal area, d) putting the water dipper back - Female: a) taking water with a water dipper, b) washing the inner part of the perineum, c) washing the outer part of the perineum, d) putting the water dipper back 2: Able to perform 1 of 4 indicators: - Male: a) taking water with a water dipper, b) washing the testicular area, c) washing the scrotal area, d)putting the water dipper back - Female: a) taking water with a water dipper, b) washing the inner part of the perineum, c) washing the outer part of the perineum, d) putting the water dipper back 3: Able to perform 2 of 4 indicators: - Male: a) taking water with a water dipper, b) washing the testicular area, c) washing the scrotal area, d) putting the water dipper back - Female: a) taking water with a water dipper, b) washing the inner part of the perineum, c) washing the outer part of the perineum, d) putting the water dipper back 4: Able to perform 3 of 4 indicators: - Male: a) taking water with a water dipper, b) washing the testicular area, c) washing the scrotal area, d) putting the water dipper back - Female: a) taking water with a water dipper, b) washing the inner part of the perineum, c) washing the outer part of the perineum, d) putting the water dipper back 5: Able to perform all indicators: - Male: a) taking water with a water dipper, b) washing the testicular area, c) washing the scrotal area, d) putting the water dipper back - Female: a) taking water with a water dipper, b) washing the inner part of the perineum, c) washing the outer part of the perineum, d) putting the water dipper back
031012	Wipes self after bowel movement	1: Unable to perform all indicators: a) taking water with a water dipper, b) washing the anal area, c) washing the genital area from the front to back, d) putting the water dipper back 2: Able to perform 1 of 4 indicators: a) taking water with a water dipper, b) washing the anal area, c) washing the genital area from the front to back, d) putting the water dipper back

Code	Indicator	Indicator Operational Definition
		3: Able to perform 2 of 4 indicators: a) taking water with a water dipper, b) washing the anal area, c) washing the genital area from the front to back, d) putting the water dipper back 4: Able to perform 3 of 4 indicators: a) taking water with a water dipper, b) washing the anal area, c) washing the genital area from the front to back, d) putting the water dipper back 5: Able to perform all indicators: a) taking water with a water dipper, b) washing the anal area, c) washing the genital area from the front to back, d) putting the water dipper back
031008	Gets up from toilet or commode	1: Unable to move from the toilet or elimination aids 2: Able to move from the toilet or elimination aids with the assistance of others 3: Able to move from the toilet or elimination aids with assistive devices (for example: hand rail) 4: Able to move from the toilet or elimination aids independently without any assistive devices and the assistance of others but need direction or supervision 5: Able to move from the toilet or elimination aids independently without any directions or supervisions, assistive devices, and the assistance of others
031009	Adjust clothing after toileting	1: Unable to perform all indicators: a) taking the clothes after urinating/defecating, b) putting on underwear, c) putting on skirt/pants, d) closing zipper or buttoning up 2: Able to perform 1 of 4 indicators: a) taking the clothes after urinating/defecating, b) putting on underwear, c) putting on skirt/pants, d) closing zipper or buttoning up 3: Able to perform 2 of 4 indicators: a) taking the clothes after urinating/defecating, b) putting on underwear, c) putting on skirt/pants, d) closing zipper or buttoning up 4: Able to perform 3 of 4 indicators: a) taking the clothes after urinating/defecating, b) putting on underwear, c) putting on skirt/pants, d) closing zipper or buttoning up 5: Able to perform all indicators: a) taking the clothes after urinating/defecating, b) putting on underwear, c) putting on skirt/pants, d) closing zipper or buttoning up

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ORIGINAL RESEARCH

Parental Challenges in Promoting the Well-being of Talented Youths in Indonesia: A Phenomenological Study

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Abstract

Background: Parenting talented youths is a challenging task since most talented youths experience role complexities in their lives. Thus, raising talented youths can lead to increased challenges of parenting.
Purpose: This study aimed to explore the challenges faced by Javanese Muslim parents in promoting the well-being of talented youths.
Methods: A descriptive phenomenological approach was chosen to guide this study. Thirteen Javanese Muslim parents of talented youth (nine men and three women) were recruited using snowball and purposive sampling techniques. The data were obtained by conducting semi-structured interviews and field notes. The collected data were transcribed using verbatim transcription and analyzed using Giorgi's method of analysis.
Results: Three themes were found after data analysis, i.e., challenges coming from the youths, challenges from the community, and the existence of financial constraints in the family. Challenges coming from the youth were related to the oppositional behavior of talented youths and difficulties in managing children's activities as students and as talented youths. Challenges from the community included low commitment and belittling behavior from teachers or lecturers, ridicule from their neighbors, gender-based discrimination, and the absence of support from the organization. Another theme was related to financial constraints in the family which made it difficult for parents to finance their youth's education and talent activities.
Conclusion: Identifying the actual problems experienced by the talented youths' parents could help nurses develop appropriate family programs, consider, and incorporate holistic aspects into the programs to obtain optimal results.

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1. Introduction

Talented youths are people who have extraordinary abilities in at least one human activity, which places them in the top 10% of their peer group with similar expertise in that field (Dewi et al., 2021). Approximately 2-5% of Indonesian children are identified as talented youths (Dewi et al., 2021; Janah et al., 2018).

To be parents of talented youth is not an easy task (Reis & Renzulli, 2021) since most talented youths experience role complexities in their lives. Talented youths mostly achieve the highest performance level in certain areas at a very young age (Scantlebury et al., 2020). Consequently, their routines are usually regulated under strict management for training time, travel time for competitions, and studies (Henriksen et al., 2020; Phibbs et al., 2018; Slaten et al., 2020). At the same time, they must learn how to deal with the stress they encounter in every tournament, organization, and in their personal life (Phibbs et al., 2018; Scantlebury et al., 2020; Slaten et al., 2020). All these factors certainly influence their academic achievement and peer relationships (Slaten et al., 2020). Thus, raising talented and/or gifted children may be more challenging than raising their peers (Rouquette, in press; Tessitore et al., 2021). The challenges faced by parents may significantly increase as these children demand the most extraordinary parenting requirements (Baimukanova, 2020; Tessitore et al., 2021).

The constituents of interconnected communities in the environment where parents are involved will give a unique meaning to their experiences (Clarke & Harwood, 2014). This meaning

can also affect the lives of the parents (Renati et al., 2017) and the parenting patterns. For example, the Javanese Muslim community believes that parenting aims to build the main character and fulfill children's rights. These characters include the character of being a good Muslim (possessing *akhlakul kharimah* - good behavior based on religion) (Karimah & Ummah, 2020; Vinayastri, 2015) and the character of being a good Javanese person (Ali & Arenggoasih, 2020). On the other hand, parents must also be responsible for fulfilling children's rights; therefore, Javanese Muslim parents expect their children's health from childhood (Ali & Arenggoasih, 2020; Hartono et al., 2017). Accordingly, community, religiosity, and cultural features can be highly significant for exploring the challenges of parents in raising talented youths.

Most studies concerning talented youth have tended to explore parenting challenges from the western perspective (Baimukanova, 2020; Reis & Renzulli, 2021; Tessitore et al., 2021; Wellisch, 2021). However, there is still no empirical research to describe the challenges from the perspective of Javanese Muslim parents. Therefore, the author proposes further research on the influence of Javanese Muslim social and cultural features, which are needed to improve theoretical understanding of parents' perceptions of the challenges in promoting the well-being of talented youth. Therefore, this study aimed to explore the challenges that parents experience in promoting the well-being of talented youths from the perspective of Javanese Muslim parents.

2. Methods

2.1 Research design

This study used a descriptive phenomenological approach to understand the essence of parents' challenges to promote the well-being of talented youth from the perspective of Javanese Muslim parents, which is still not clearly understood. Descriptive phenomena can describe the meaning of Javanese Muslim parents about parental challenges that they deal with.

2.2 Setting and participants

This study was conducted from August 2017 to April 2018. This study chose East Java and Central Java Provinces in Indonesia as the research location due to the fact that 98% of the Javanese population lives in these provinces, and around 80% are Muslims. The participants of this study were 13 Javanese Muslim parents of talented youth, including three mothers and nine fathers. These participants were recruited based on the following criteria: (1) a mother or father who identified her/himself as a Javanese Muslim; (2) having talented children who had received any awards at least at the national level, and (3) able to communicate in both Indonesian and Javanese. Purposive and snowball techniques were used to select the participants.

2.3 Data collection

The principal researcher conducted all the interview processes. The researcher collected the data through semi-structured interviews and field notes. The interviews were conducted twice with each participant; the first and the second interviews were held on different days. During the first interview, the researcher asked several questions based on the interview guidelines. Several questions need to be investigated further to obtain the participants' answers eventually. The first interview session took 60 to 90 minutes. After making a verbatim transcript of the recording, the researcher read and reread the transcript. Then, the researcher identified the answers which required clarification through follow-up interviews at a later time. The principal researcher conducted the second interview to obtain additional data when the first interview required more in-depth data. The second interview lasted for approximately 30 to 45 minutes. All interviews were recorded using a voice recorder.

During the interviews, the researcher used mixed languages between Javanese and Indonesian. To open the interview process, the researcher used general introductory questions. An example of this question was: "Do you have any idea if your child is talented?." After the parents responded to the initial questions, the following interview aimed to clarify the initial responses, such as "What are the challenges as parents in raising your child?." This question aimed to explore parents further and to enable them to continue to talk about their experiences. Other questions, such as "How are the challenges affecting your daily life?" were designed to bring out the parental experience in detail.

While exploring the parents' experiences during the interviews, the researcher clarified some vague statements to ensure that the researcher's understanding of the experiences was consistent

with how the parents experienced them. To gather further information, the researcher followed up using inquiry questions about the focused issues. During the interview process, the researcher also took field notes to improve the quality of the data.

2.4 Data analysis

Giorgi (2012) stated that researchers are trying to understand the meaning of the description as presented. However, before the process begins, descriptive phenomenology suggests that the researcher isolates his or her own parenting experience as it will influence the perception of the data during the data analysis process.

The researchers reread the transcribed text while listening to the audio recording to make sure the material was transcribed literally and accurately. After the researchers were sure that they had obtained a complete and accurate transcript, the raw data were analyzed in several steps, as illustrated. First, the researchers read the transcribed data several times to obtain an overall sense of the transcript being read. Second, the researchers identified the meaning unit. Third, the researchers converted meaning units into transformed unit meaning. The natural attitude of each parent was changed into phenomenological and psychologically sensitive expressions. Finally, the structure can be determined (Broome, 2011; Giorgi, 2012). The example in the data analysis process was provided in Table 1.

Table 1. Example in the data analysis process

Step and Transformation	Statement
Transcription	*I am disappointed with her teachers' attitude*. Some of them do not support her talent. They asked why my daughter preferred taking part in competitions to school activities. Sports cannot support her future life. I do not understand her teachers' perception. *They tend to belittle her talent. They are not true teachers.*
Unit of meaning	*I am disappointed with the attitude of my daughter's teachers. They tend to reject her talent. They are not real teachers.*
Unit of transformation meaning	Parents are disappointed with teachers who do not support their youth's talents. The teachers commented negatively on the athlete's life. Parents think that teachers' attitudes of ignoring and/or even belittling students' talents are not appropriate.
Sub-theme	Belittling attitudes from the teachers
Synthesis of the theme structure	Challenges from the community

2.5 Trustworthiness

The researchers used bracketing and reflection journaling during the research process. The researcher deliberately ignored all knowledge, opinions, or views concerning the researchers' background to minimize bias. Instead, the researcher locked all knowledge, beliefs, and thoughts about aspects that might influence the research process into a reflective journal. When the researchers reviewed the literature, the researchers focused on previous relevant research studies to find any knowledge gaps rather than to gather evidence that would probably influence the researchers' perceptions. The researchers then triangulated data from interviews and field notes to ensure the reliability and validity (rigor) of the research.

The researchers worked together to check whether the research process was acceptable, essentially regarding the research method, which included sampling selection, data collection, procedures, and data analysis. Then, the researchers assessed the internal consistency of whether the data supported the findings. The researchers also examined the consistency of the results, interpretations, and conclusions of the study. Furthermore, since this study was a part of a dissertation, the dissertation committee members reviewed and audited all research processes and findings.

2.6 Ethical considerations

The institutional review board (IRB) of the Faculty of Nursing, Prince of Songkla University, Thailand, had approved this study (No. 2017 NSt–Qn 029). Informed consent was conveyed both orally and in written to the participants. This informed consent consisted of four important elements of ethical considerations, including the purpose of the study, what would happen during the interview, potential benefits, and any risks regarding the interview process. The researchers allowed parents to ask any questions related to the given informed consent and then let them decide whether to participate in the study or not.

3. Results

3.1 Characteristics of participants

The Javanese Muslim parents were recruited from two provinces in Indonesia: Central Java and East Java. Three mothers and nine fathers aged between 50 and 62 years participated in this study. Except for three parents (one was a housewife and the other two were retired), the rest were public servants or self-employed/entrepreneurs. Almost all of them completed their undergraduate education (6 Participants) or senior high school degree (5 Participants); the other two had finished elementary and junior high school. One participant was a widow, while the others were married (12 participants). Six Participants were included in middle-income, four in high-income, and the other three were categorized as low-income families. Demographic characteristics of participants were provided in Table 2.

Table 2. Demographic characteristics of the research participants (n=13)

Characteristics	Number of Parents
Age (years old)	
40 – 55	5
56 – 61	8
Gender	
Male	10
Female	3
Education Level	
Elementary School	1
Junior High School	1
Senior High School	5
Bachelor Degree	6
Marital Status	
Married	12
Widow	1
Economic Status	
Low	3
Middle	6
High	4
Occupation	
Public servant	5
Entrepreneur/self-employee	5
Retired	2
Housewife	1

3.2 Participants' perspectives in promoting the well-being of talented youths

Based on the participants' perspectives, three themes were found: (1) Challenges coming from the youths, including the children's oppositional behavior and difficulties in managing children's activities, as students and as talented youths; (2) Community challenges were resulted from belittling attitudes from their children's teachers/lecturers, ridicule from their neighbors, gender-based discrimination, and lack of support from organizations; and (3) The existence of financial restrictions in the family.

3.2.1 Challenges from the youths

The participants stated that their main challenges were related to their children's oppositional behavior and difficulties in managing activities for the children with dual roles: as

students and as talented youths. Parents described parenting youths as the most challenging parenting period because youths, during this age, tend to be in opposition to their parents. They reported that quarrels and strained relationships between parents and teens were common during this time. Moreover, breaking parental rules was a common problem for parents. For example, parents of youths with the talent of memorizing the Qur'an implemented some rules for their children. Their children were forbidden to watch television, listen to music, and sing songs. They believed that music and television materials could reduce the ability to memorize the Qur'an. However, the youths often broke these rules. They listened to music, sang songs, and watched television elsewhere, which could make their parents angry.

> "…When my son sings songs, I am angry. They will find it difficult to memorize the Qur'an. They know it exactly (listening to music, singing songs, and watching television) are forbidden in our family. They often violate my rules. My son watches television at his friend's or relative's house. When I caught them, they argued me with some reasons…" (P11)

Other participants, whose children were youth athletes, stated that they experienced a strained relationship with their children. Young athletes often neglected training when they felt bored and stressed and needed to relax. Talented youths experienced social estrangement due to the lack of time they had. This causes them to become bored and stressed.

> "Sometimes, he gets bored and stressed with training and needs to relax. I'm mad at him for not training. A table tennis athlete has to train regularly. This often strains our relationship…" (P1).

> "Sometimes he misses regular training when she feels tired, bored and needs to relax. Her training center is located in another city; she has to go to the training center by train every Saturday morning and has to return to her hometown on Sunday evening. She rarely spends time with friends. Maybe, it causes her to become bored and stressed. She needs to relax." (P6)

According to parents, the main difficulty they experienced was how to manage the balance of the two main activities of university students, i.e., completing assignments from campus and participating in joint training schedules. As university students, the youths tended to pile the campus assignments on and completed them when the deadline for submitting the assignments was approaching. As a result, most of the campus assignments were eventually not completed by the required deadline. Parents complained that their teenagers did not have perseverance in doing their assignments. Even though they knew that unfinished tasks would affect the arranged schedule related to their athletic activities, reducing the time for training would decrease their physical stamina and lower the target set by the trainer.

> "… As a university student, she should manage her campus assignments. Most of the courses she took have assignments with deadlines. However, she, again and again, delays doing the assignments. As a result, her assignments pile up. When the deadlines for the assignments come, she is often absent from training at the table tennis club. Because of this, she frequently doesn't achieve her training target." (P7)

> "She has to finish her assignments before the deadline because she has a busy schedule as an athlete and as a university student. She sometimes misses them. She delays finishing her homework …" (P4)

3.2.2 Challenges from the community

This theme refers to the attitudes and behaviors of teachers, neighbors, and/or sports/arts organizations that do not support talented youths and their families. The main source of these obstacles is the lecturers/teachers. One athlete's father complained about his son's bachelor thesis advisor, who often delayed meetings or rescheduled thesis consultation appointments. The parent felt that his son's advisor had a low commitment to support the talented youth. This resulted in

their children having to extend the length of their studies. Accordingly, this caused parents to worry about their children's academic future.

> "His advisor often reschedules thesis consultation appointments. She (advisor) did not have a good commitment to help my son. My son has trouble meeting his thesis advisor, so his study was extended. As a result, we had to reschedule some of the tournaments which he should have attended. We gave up on participating in some tournaments held in other provinces because he needed to consult his thesis with his advisor regularly. I'm afraid; if this continues, he might not be able to finish his study within this semester…" (P1)

Another parent was disappointed with teachers who did not support their youth's talents. The teachers commented negatively on the athlete's life. Parents thought that teachers' attitudes of ignoring and/or even belittling students' talents were not appropriate.

> "I am disappointed with her teachers' attitudes. Some of them do not support her talent. They asked why my daughter preferred taking part in competitions to school activities. Sports cannot support her future life. I don't understand her teachers' perceptions. They tend to belittle her talent. They are not true teachers." (P6)

Another challenge that parents had was coming from their neighbors' comments. The neighbors would say that pursuing a career as an athlete leaves their life full of uncertainty in the future. The neighbors stated that because the talent was just a hobby, not a job. For example, the father of a female table tennis athlete (P7) stated, "My neighbor said that all athletes face uncertain financial conditions in the future. Most of them become poor in their old age. They do not have enough money to live…" Such unsupportive comments make parents feel uncomfortable and disappointed. They find it difficult to stop the ridicule from some people in their social circle.

> "…Why are they so unsympathetic? I feel uncomfortable and disappointed. My daughter just stays at home. She doesn't want to meet them (neighbors) and listen to their ridicule. It's hard to stop their comments…" (P13)

Gender-based discrimination is another challenge faced by parents of female athletes (soccer and Kempo athletes). In addition, some neighbors thought that some kinds of sports were considered inappropriate and incompatible or even violate the nature of a woman.

> "My neighbors said that it (being a soccer player) is inappropriate for a woman; it's a men's sport." (P3).

> "My schoolmates told me that joining Kempo made my daughter masculine." (P10)

In addition, some people would consider it taboo if women traveled far from home alone even though they went abroad to bring the name of the nation to international events.

> "My daughter often goes abroad to dance to bring the name of Indonesia. My neighbors asked me why I allowed my daughter to go abroad alone. They said she is a woman." (P8)

In addition, parents of young athletes perceived that the sports association which houses their children's talent did not adequately support their talent potential. They felt like the sports association was just exploiting them.

> "The women's soccer organization never made a significant contribution to my daughter. They just want her achievements. They exploit her." (P3)

> "He was ranked the first and was selected as the player to join the national team, but the lower-ranked player who had connections with the officials beat him. His friend did nepotism. The table tennis association couldn't do anything. The association official

couldn't defend my son from being in the first team. I complained about it, but no one answered my protest." (P2)

3.2.3 Financial constraints in the family

The theme of financial constraints in the family refers to the financial pressure condition of the family that made it difficult for them to meet the needs of their children as students and talented youth. Parents often experienced financial constraints, especially the low and middle-income parents. All participants were from middle and low economic income classes. It was difficult for them to finance the needs of an athlete; besides, their children also did not receive scholarships for their undergoing education. This situation caused their children to be unable to focus on their studies or in competitions due to the lack of financial resources. Participants felt a heavy burden to meet the needs of athletes, such as sports equipment, sports clothing, club administration fees, competitions, and living costs to participate in competitions. Such types of expenses were very costly, which they frequently could not afford.

"We fight very hard. I buy everything I need for him. Most of the necessities are related to equipment, such as rackets, shoes, rubber, club administration fees, competitions and living expenses for competitions." (P1)

"As a public servant, my wife and I have a limited salary; it is even only to meet our daily needs; it is difficult." (P2)

"We have financial problems. Our business went bankrupt. We have no money at all. So, it put a tremendous amount of pressure on our family. As a result, we have difficulty paying for our children's education. She doesn't get any scholarships. We also have difficulty not only in education but also in preparing food." (P12)

4. Discussion

This study showed that parenting talented youths is the most challenging period since breaking parental rules at this age is a common problem that parents face. Talented youths often have asynchronous development, exhibit unusual behavior, have difficulty in accepting rules and routines, and have school problems, which cause frustration and increase parenting stress on parents (Renati et al., 2017). Also, this study identified difficulties faced by parents, mainly from father participants, to balance time management for their children that have dual roles of being a university student and for their talents' exercise. Fathers always try to meet the needs of their children and optimize their children's development (Khasanah & Suratni, 2013), including making strict time management for their gifted children. This research also explains the reason for time management difficulty due to the habit of their children to procrastinate on completing campus assignments and prefer to do them when they are approaching deadlines, which has an impact on failure to complete assignments thoroughly. Consequently, they often forget the exercise and training that must be undertaken. These talented youths also experience social estrangement due to the lack of time they have. This causes them to become bored and stressed. Many causes of stress experienced by talented students include heavy workload, preparing for the future, academic responsibilities, extracurricular activities, and social life (Kregel, 2015). Commitment to training can also be a stressor for the youth when they want to spend quality time with friends (Elliott et al., 2018).

This study, however, identified that the low commitment and belittling behavior from lecturers/teachers in helping talented youth creates confusion for parents in managing the balance of roles played by their children. This makes parents worried about their children's academic future. The harmonious relationship between the lecturers and the students is an important aspect that contributes to the success of talented youths (Bonner, 2001). Previous studies identified that lecturers could cause stress for parents through their unsupportive behavior or statements regarding talent-related activities which their children need to attend (Bartley, 2014; Free, 2014; Geake & Gross, 2008; Renati et al., 2017). Patronization, humiliation, and threats are some of the university/school stressors that can highly trigger the well-being of talented youth (Free, 2014). Lack of support from most lecturers for these youths and their families may be due to a lack of knowledge about talented people (Free, 2014).

Moreover, this study also found that neighbors cause another stress felt by parents who have worked hard for the well-being of their talented youth. A previous study identified that one of the challenges that parents face stems from negative societal attitudes, i.e., stigmatization of talented youths who are seen as having poorer physical or mental health (Free, 2014). This study also shows similarities regarding the role of the community in increasing parental stress. That stigmatization is linked to academic achievement and anecdotally lower prospects in the future life of someone who chooses to pursue their talents over academics. The stigmatization has led some youths to stay at home instead of meeting neighbors after hearing their comments. In addition, parents and their talented youths often experience isolation (Renati et al., 2017).

Gender-based discrimination is another difficulty faced by parents of talented female youth. Parents admitted that some Javanese still believe in tasks difference based on gender. Khilmiyah (2017), in her study, found that usually, the community believes that women's duties include everything related to the use of tenderness and feelings; on the contrary, men's duties include everything related to physical and mental strength. In addition, there is a dichotomy of public and domestic roles rooted in the ideology that a woman's role is to be at home, and a man's role is to be the breadwinner (wage earner). In turn, this helps perpetuate the division between the productive and reproductive functions of men and women at home. Some Javanese people still think that the duties of Javanese women consist of make-up *(macak),* cooking *(masak),* and giving babies *(manak)* only (Tuapattinaya & Hartati, 2014). Therefore, it is not surprising that parents also experience gender discrimination regarding the selection of their children's talents, especially parents whose daughters pursue sports that are predominantly done by males or are engaged in the male gender, such as Kempo, dominate, and soccer.

Some parents also voiced their dissatisfaction with the lack of support from the sports associations their children belong to. Being ignored by sports associations is an example of rejection from their talented youths. Renati et al. (2017) found that parents of talented youths perceive that the organization does not support them or their talented youths. However, a previous study reported that problems with organizations assisting talented youth are caused by some factors such as funds and personnel availability, spending on traveling competitions, and so on (Free, 2014).

This study states that some parents (middle and low-income families) face difficulties paying campus tuition and living expenses for students at university, meeting routine needs (e.g., equipment, membership fees) to support their children's talents, and participating in talent competitions held. These results confirm the previous research stating that parents of talented youth have to make adjustments and even sacrifice for their regular family routines. Supporting talented youths is expensive (Aujla et al., 2014).

5. Implication and limitation

This study provides several implications for nursing practices and nursing research. Understanding cultural and contextual experiences of Javanese Muslim parents with talented youth have implications for nursing practice that seeks to support parents to get through several challenges. Nurses can develop family-based programs by considering and incorporating holistic aspects into the program. In addition, this study also has implications for further research. The results of this study can be used as basic data in developing a parenting intervention model to improve the well-being of talented youths.

This study has limitations since the sampling selection used the snowball sampling method. Fathers as participants tended to direct the researchers to refer to the next participant of the same gender, i.e., male. Therefore, the majority of participants in this study were fathers. In addition, the selection of talented youths by using the snowball method has limited the selection of talents possessed by the youths. In this study, the majority of talented youth are in the sports field.

6. Conclusion

This study identified the real challenges faced by talented youths' parents, including the challenges coming from the youths, the community, and family financial constraints that affected the lives of parents. Nurses should be aware of and develop family-based programs to support parents in promoting the well-being of talented youths by considering holistic aspects in making their interventions.

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Author contribution

NSD: study design, conceptualization, data collection, data analysis, manuscript writing; PJ: study design, manuscript writing; WW: study design, data analysis, manuscript writing.

Conflict of interest

The authors declare that there is not any conflict of interest.

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ORIGINAL RESEARCH

Effects of Guided Antenatal Education Support Programs on Postnatal Depression, Social Support, and Life Satisfaction among First-time Mothers in Kelantan, Malaysia

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Abstract

Background: First-time mothers may experience postnatal depression and a lack of social support, affecting their life satisfaction. However, there is a lack of studies investigating the application of guided antenatal education support programs to deal with such issues.
Purpose: The study aimed to evaluate the effects of guided antenatal education support programs on postnatal depression, social support, and life satisfaction among first-time mothers.
Methods: This quasi-experimental study involved a total of 72 first-time mothers. Convenience sampling was applied for participant selection, and no randomization was used. The participants were equally divided into the intervention group and the control group. A self-administrated questionnaire was used for data collection during the antenatal period (pretest) and six weeks postpartum (posttest). The risk of postnatal depression was assessed using the Edinburgh Postnatal Depression Scale (EPDS). In addition, the Multidimensional Scale of Perceived Social Support (MSPSS) and the Satisfaction with Life Scale (SWLS) were used to assess social support, and life satisfaction, respectively. The intervention group received a guided antenatal education support program, consisting of antenatal education sessions plus an extra 15-minute discussion and a support guidebook. The data were analyzed using a paired t-test and an independent t-test.
Results: There was a significant reduction in the risk of postnatal depression score in the intervention group ($p<0.05$) after receiving the guided antenatal education compared to the control group. Also, there was a significant increment of life satisfaction score ($p<0.05$) and social support score ($p<0.05$) after receiving guided antenatal education in the intervention group.
Conclusion: The guided antenatal education support is beneficial to reduce postnatal depression and increase life satisfaction and social support. Nurses and midwives should provide an integration of psychoeducation for first-time mothers, especially during pregnancy.

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1. Introduction

Pregnancy is commonly associated with psychological and physiological changes which can change one's life and relationships with others (Afshari et al., 2020). The transition to parenthood is one of the challenging life events that cause significant distress, especially among first-time parents (Missler et al., 2020). First-time mothers have a higher risk of getting postnatal depression than mothers who experienced childbirth (Vismara et al., 2016). Preoccupations, worries, and anxiety that persist during pregnancy and postnatal periods increase the risk of developing postnatal depression (Vismara et al., 2016). Women's functioning, marital and personal connections, mother-infant interaction quality, and children's social, behavioral, and cognitive development are all adversely related to postpartum depression (Al Nasr et al., 2020). Various risk factors for postpartum depression have been reported in the previous studies, which

include a lack of social support, marital conflict, existence of history depression, lack of breastfeeding, or recent stressful life events (Al Nasr et al., 2020; Kheirabadi et al., 2009). Unemployment, a lack of education, and an unwanted pregnancy have all been linked to an increased chance of getting postpartum depression (Al Nasr et al., 2020).

Positive social support from family and friends eases the transition to motherhood and may help increase parenting competence during the role-transition period (Esmaelzadeh Saeieh et al., 2017). Social support is one of the predictors for postpartum depression and maternal role competence. Maternal competency and pleasure with the maternal role are important to embrace the maternal role (Esmaelzadeh Saeieh et al., 2017). Becoming a mother for the first time is a significant developmental milestone in adulthood. The birth of a child is not only a significant event for couples, but it also causes concern for the entire family. First-time mothers may have a feeling of incompetence in their maternal role (Nelson, 2003). First-time mothers may need guidance and good social support to adapt to their new roles as mothers.

Life satisfaction may change during and after pregnancy, especially in first-time mothers, as they may experience parenthood. A previous study suggested that positive and negative life events may play an important role in determining overall life satisfaction (Ngoo, 2019). Life satisfaction may be influenced by family's social support, financial status, marriage satisfaction, and family planning (Munaf & Siddiqui, 2013). Human development, including any change in life events, is strongly associated with life satisfaction (Ngoo, 2019). Pregnancy and childbirth are important life events for a woman. The pregnancy and the first childbirth may have an impact on relationship satisfaction among first-time mothers (van Scheppingen et al., 2018).

Brief psychoeducational interventions are beneficial for providing information that may effectively reduce psychological distress (Missler et al., 2020). The social and psychological needs of pregnant women are important to be addressed as pregnancy changes their physical, psychological, and social status (Omidvar et al., 2018). In this regard, antenatal education is important and beneficial during childbirth and helps prepare for early parenthood (Hildingsson et al., 2013). The need for psychological support and education regarding pregnancy, birth, and postpartum in the antenatal education class is needed, especially among first-time mothers. However, there is still a lack of studies assessing life satisfaction and social support among first-time mothers in Malaysia. Hence, it is necessary to highlight the importance of psychoeducation intervention during the antenatal period for new mothers. Accordingly, this study aimed to find out the effects of guided antenatal education support programs on postpartum depression, social support, and life satisfaction among first-time mothers.

2. Methods

2.1 Research design

A quasi-experimental study was conducted to determine the effects of guided antenatal education support programs on postpartum depression risk, social support, and life satisfaction among first-time mothers.

2.2 Setting and samples

The study was conducted among first-time mothers who attended an obstetric clinic in a public university's hospital in Kelantan, Malaysia, between January to May 2016. First-time pregnant women aged above 18 years old at their second and third trimesters of pregnancy (between 12 to 36 weeks of gestation) were recruited in the study using convenience sampling. They were equally divided into the intervention and control groups. Informed consent was obtained from all participants who agreed to join the study. Pregnant women who were single parents, recently or previously diagnosed with psychiatric illnesses, or had other medical illnesses were excluded from the study. The sample size was calculated based on the previous study for risk of postpartum depression, which used the Edinburgh Postnatal Depression Scale (EPDS) for data collection (Kamalifard et al., 2013). The minimum number of participants to include in the study sample was calculated using a power analysis (power=0.80, α=0.05) in the Power and Sample Size software version 3.0.43. The calculated number of participants with the addition of an estimated 20% dropout was 36 participants for each group. Thus, the total samples for both groups were 72 participants. Randomization was not used in the study. The participants were equally assigned into the intervention group (n=36) and control group (n=36) based on the researchers.

2.3 Intervention

The participants in the intervention group attended one-hour antenatal education classes during antenatal visits in a specific and spacious room in the antenatal clinic. The antenatal education sessions were conducted by qualified midwives and nurses. The participants had to complete all three education sessions. The antenatal education class provided consisted of three sessions, as shown in Table 1.

Table 1. Description of guided antenatal education

Session	Duration
Session 1: Lecture and video presentation	
Introduction to the reproductive system in female fetal growth in utero	60 minutes
Psychological changes in pregnancy	
Common problems before delivery	
Introduction to symptoms and stage of labor.	
Session 2: Lecture and demonstration	
Diet during pregnancy	60 minutes
Exercise in pregnancy	
Breathing technique for successful labor	
Pain reduction in labor and husband's role during birth.	
A normal physical change after birth and danger symptoms and signs after delivery	
Session 3: Demonstration and practical session	60 minutes
Care of newborn	
Breastfeeding techniques	
Expressed breast milk techniques	
Breastmilk storage and usage.	

The participants received an extra 15-minutes of a face-to-face discussion with the researcher on the topics presented in the powerpoint slides at the end of the third session (guided antenatal education support). Open discussions on the topics presented during the antenatal class and postpartum issues written in the postnatal guidebook were discussed and explained to the participants in the intervention group. They also received a postnatal support guidebook developed by the researcher. The guidebook consisted of information regarding postpartum depression, including symptoms and signs of depression after giving birth, the triggering factors that contribute to depression, recommendations, and the ways to get support from family members when having depression during the postpartum period. The information in the guidebook was adapted from the national standard protocol and World Health Organization (WHO) guidelines. The participants in the intervention group were encouraged to share the information in the guidebook with their family members. The participants in the control group only received antenatal education class sessions. Both groups were evaluated after the intervention phase at six weeks postpartum when they came for postnatal follow-ups. The flow of the study is shown in Figure 1.

2.4 Measurement and data collection

Self-administered questionnaires were utilized to collect data during the pre-intervention phase and post-intervention phase. These questionnaires consisted of baseline characteristics and sociodemographic data (age, gestational age during data collection, race/ethnic, occupation status, education status, duration of marriage, and plan of the pregnancy) and the Edinburgh Postnatal Depression Scale (EPDS), Multidimensional Scale of Perceived Social Support (MSPSS) and Satisfaction with Life Scale (SWLS) to assess postnatal depression risks, social support, and life satisfaction, respectively. Before the intervention phase, participants in both groups were requested to complete the questionnaires using pens and papers. Similarly, after the intervention phase, another collection of data at six weeks postpartum was done for post-intervention assessment. The assessment of postnatal depression risk, social support, and life satisfaction was also conducted using the similar instruments (i.e., EPDS, MSPSS, and SWLS).

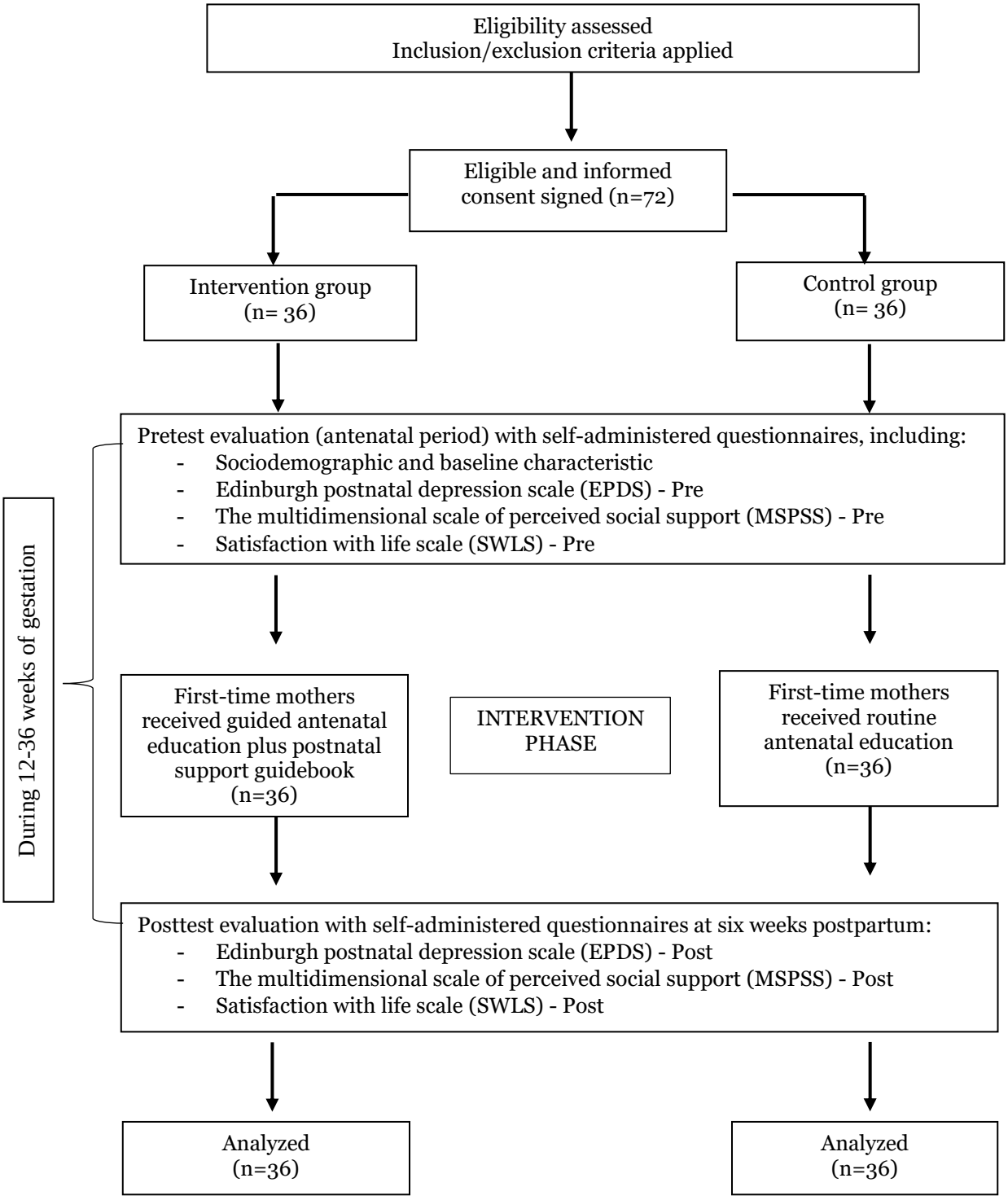

Figure 1. The flow of participants in the study

2.4.1 Edinburgh Postnatal Depression Scale (EPDS)

The risk of postnatal depression was assessed using the EPDS. The EPDS is a self-evaluated questionnaire consisting of 10 items in the Likert scale format developed by Cox et al. in 1987 (Cox et al., 1987). The total score ranged from 0 to 30, and a higher score foreshadows psychological pressure or a risk of depression. The validated Malay version was used in the study. A cut-off score of 11.5 or higher had a sensitivity of 72.7%, and the specification is 95.1% to detect postnatal depression and a positive predictive value of 50% (Azidah et al., 2006). The internal consistency of the Malay version EPDS was at a level of 0.86 (Azidah et al., 2006).

2.4.2 Multidimensional Scale of Perceived Social Support (MSPSS)

The MSPSS was used to measure various dimensions of sufficient social support from family, friends, and significant others (Ng et al., 2012). It consists of 12 items scale with 7 seven-point Likert scale format (1=truly disagree, 7=fully agree) and possible responses to each statement (scored 0-6) give a score out of a maximum of 72 with a higher score indicating greater perceived social support. The MSPSS measures the perceived adequacy of social support from three sources, including family members (items 3, 4, 8, and 11), friends (items 6, 7, 9, and 12), and significant others (items 1, 2, 5, and 10). The overall count of social support means for all items used in the research mean score shows strong social support. The original version of the MSPSS has a very good internal reliability score with an α coefficient of 0.88 for the total scale, 0.87 for the family subscale, 0.85 for the friend subscale, and 0.91 for the significant others subscale (Zimet et al., 1990). The original version of the MSPSS is a 12-item. The Malay version of MSPSS Cronbach's alphas for family, friends and significant others were 0.89, 0.90, and 0.94, respectively, in the non-psychiatric group (Ng et al., 2012).

2.4.3 Satisfaction with life scale (SWLS)

The SWLS was developed in 1985 by Diener et al. (Diener et al., 1985). It has 5 items with 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). SWLS was used to assess subjective emotional well-being and life satisfaction (Aishvarya et al., 2014). The total score ranges between 5 to 35, with higher scores indicating a more significant life satisfaction. A validated Malay version of SWLS was used in the study. The SWLS factor has high internal consistency, with Cronbach's alpha of 0.86 (Aishvarya et al., 2014).

2.5 Data analysis

Data analysis was performed by using SPSS version 21 (IBM corp. USA). The p-value was used to determine the statistical significance, and the *p*-value of <0.05 was considered significant. The paired t-test was used to determine the mean score differences in the control and intervention groups pre and post-test. The independent t-test was used to determine the significant mean score differences between the two groups. The Pearson's correlation analysis was also conducted to determine the relationship between postnatal depression and life satisfaction, and the relationship between postnatal depression and social support.

2.6 Ethical considerations

Informed consent was obtained from all participants who agreed to participate in the study. All participants signed the written informed consent prior to the recruitment and data collection. The study was approved by the Research Ethics Committees of Universiti Sains Malaysia (Ref. USM/JePeM/15090293), and permission from the director of Hospital Universiti Sains Malaysia (Ref. HUSM/11/020/Jld) was also obtained.

3. Results

3.1 Characteristics of respondents

As presented in Table 2, the mean age of the participants in both groups was 26.3 years old. Most participants in each group were Malay ethnic, and the marriage duration was less than two years. More than half the participants in both groups planned for their pregnancy. In addition, more than half of the participants in both groups had higher education levels.

3.2 Effects of guided antenatal education on postnatal depression

Table 3 shows that the EPDS score had a more significant reduction in intervention group as compared to the control group. Paired t-test showed a significant mean difference between pre and post-intervention phases. The finding showed that those participants in the intervention group who received guided education had a lesser risk for postpartum depression than those in the control group ($p<0.05$).

3.3 Effects of guided antenatal education on social support

Table 3 also shows that those who received the intervention had a significant increase in the mean score of MSPSS after the intervention compared to the control group. Paired t-test showed a significant difference in the mean score of MSPSS in pre and post-intervention ($p<0.05$) for the

groups. In addition, social support was higher among participants in the intervention group than the control group, as shown in Table 3.

Table 2. Baseline characteristics of participants

Variables	Control group (n=36) f (%)	Intervention group (n=36) f (%)	*p*-value
Age (Mean ± SD)	(26.3±3.22)	(26.3±2.75)	0.96[c]
Gestational age			
20 weeks - 24 weeks	8 (11.0)	1 (2.7)	0.06[a]
25 weeks- 36 weeks	64 (89.0)	35 (97.2)	
Race/Ethnic			
Malays	33 (91.7)	34 (94.4)	0.64[a]
Chinese	3 (8.3)	2 (5.6)	
Indians	0 (0)	0 (0)	
Others	0 (0)	0 (0)	
Occupation			
Employed	19 (52.8)	22 (61.1)	0.76[a]
Unemployed/housewife	17 (47.2)	14 (38.9)	
Education			
Higher education	23 (63.9)	26 (72.2)	
Secondary school	13 (36.1)	10 (27.8)	0.44[a]
Primary school	0 (0)	0 (0)	
Duration of marriage			
Less than 2 years	59 (82.0)	30 (83.3)	
2 - 5 years	11 (15.3)	6 (16.7)	0.34[a]
Over 5 years	2 (2.7)	0 (0)	
Plan of pregnancy			
Planned	54 (75.0)	25 (69.4)	
Unplanned	18 (25.0)	11 (30.6)	0.27[b]

[a] Chi-square test; [b] Fisher's exact test; [c] Independent t-test

3.4 Effects of guided antenatal education on life satisfaction

The SWSL score was significantly increased among the participants in the intervention group after receiving the intervention as compared to the control group. The analysis of paired t-test showed significant mean score changes in the SWSL ($p<0.05$), as shown in Table 3.

In addition, the Pearson's correlation analysis showed a significant negative relationship between postnatal depression and life satisfaction at 6 weeks postpartum (r=-0.347; $p<0.05$) among first-time mothers. In contrast, there was no significant relationship between postnatal depression and social support of first-time mothers in the intervention group before and after delivery (pre-intervention, r=0.03; $p>0.05$, post-intervention, r=0.01; $p>0.05$).

Table 3. Within and between-group comparison of EPDS, MSPSS, and SWSL before and after the intervention

Variable	Mean (SD)		Mean of score difference (95% CI)	*t*-statistic (*df*)[c]	*p*-value
	Intervention group	Control group			
EPDS					
Pretest	7.25 (3.08)	5.94 (3.54)	1.31 (-0.03, 2.87)	1.67 (70)	0.10
Posttest	4.25 (2.53)	5.78 (2.75)	-1.53 (-0.28, -0.29)	-2.45 (70)	0.02*
MD			1.58 (0.78-2.39)	3.91 (71)	<0.001[d]

Table 3. Continued

Variable	Mean (SD)		Mean of score difference (95% CI)	*t*-statistic (df)[c]	*p*-value
	Intervention group	Control group			
MSPSS					
Pretest	61.50(4.66)	60.89 (5.91)	0.61 (-0.19, 3.11)	0.49 (70)	0.63
Posttest	70.19 (4.76)	62.42 (4.81)	7.78 (5.53, 10)	6.88 (70)	< 0.001*
MD			-5.11 (-7.01, -3.2)	-5.36 (71)	< 0.001[d]
SWSL					
Pretest	24.33 (3.63)	24.19 (3.13)	0.14 (-.1.45, 1.73)	0.17 (70)	0.86
Posttest	29.11(2.80)	26.78(2.00)	2.33 (1.18, 3.43)	4.06 (63)	<0.001*
MD			-3.68 (-4.68, -2.68)	-7.35 (71)	< 0.001[d]

Notes. MD (mean difference) pre and post-intervention is based on paired t-test results.
[c] Independent t-test, the significant *p*-value for the test is <0.05. Levene's test of *p*-value >0.05 was used for homogeneity of variances assumption.
[d] Paired t-test analysis; significance value is *p*-value <0.05.

4. Discussion

This study showed that first-time mothers who received guided antenatal education had a significant reduction in their EPDS scores. Thus, we found that guided antenatal education is effective in reducing the risk of postpartum depression. Our study findings are consistent with previous research, which also reported that antenatal education is beneficial for lowering the risk of postpartum depression (Ortiz Collado et al., 2014). A focus on antenatal education targeted at disseminating knowledge about postpartum depression and its risk factors, together with anticipating postnatal issues, may be beneficial for first-time mothers who are experiencing a new role in motherhood. We provide a guidebook to pregnant women, and they could share the information with their families. A study has suggested that education targeting parenting difficulties is important to reduce depression and anxiety postnatal for first-time mothers (Milgrom et al., 2011). Antenatal education, especially the one-to-one approach or guided approach, is beneficial to the mother as they will receive information about their pregnancy, including postnatal care information (Swift et al., 2020). An antenatal class focusing on both education during the prenatal and postnatal period was suggested in the previous study (Entsieh & Hallström, 2016), and it has become one of the platforms to deliver information to pregnant women and their spouses regarding the childbirth process and information about early parenting (Chikalipo et al., 2018). The preparedness for the consequences of the pregnancy and its postpartum issues may reduce maternal distress and help reduce the risk for postpartum depression. The previous study reported that anxiety or depression during pregnancy increases with trimester and influences the preparedness for motherhood (Dere et al., 2019). The previous study suggested that one-to-one midwifery antenatal education is helpful in reducing childbirth fear, and assessment on the need for care for pregnant women can be done at this time (Swift et al., 2020).

We also found that guided antenatal education was effective in increasing the satisfaction of life among first-time mothers. This finding is consistent with another study which suggested that increment in life satisfaction is observed if the mothers received good emotional support during pregnancy and the postnatal period (Gebuza et al., 2014). Spiritual well-being also is one of the factors influencing life satisfaction (Niaghiha et al., 2019) which was not assessed in our study. A previous study in Faisalabad showed a significant negative relationship between postnatal depression and life satisfaction among postpartum women (Yaqoob et al., 2021). Similarly, in our study, we found a negative relationship between postnatal depression and life satisfaction at six weeks postpartum. Higher life satisfaction lowered the risk for postnatal depression. A study done

in Pennsylvania also showed that low relationship satisfaction during pregnancy is associated with postpartum depression among first-time mothers (Mesina et al., 2017). Life satisfaction is thought to be related to social, economic, familial, and personal factors. Dissatisfaction results from any disparity between goals, desires, and needs, which is frequently caused by specific issues and problems.

This study also found that the social support level of first-time mothers was increased with our intervention. Our study was consistent with another study, reporting that education and training in physiological childbirth preparation classes effectively reduce depression, anxiety and increase social support (Zarrabi Jourshari et al., 2020). Our intervention that included antenatal education on discussing the pregnancy, childbirth, and postnatal issues, helped improve the social support among first-time mothers in the intervention group. A greater level of perceived social support was associated with a greater level of life satisfaction (Yu et al., 2020). Support and care received from the family members, friends, and health care personnel are important, especially during the postpartum period, and it can help women to cope with new conditions of being a mother and with stressful maternal responsibilities (Akbari et al., 2020). Antenatal education is part of social support for first-time mothers. Social support is significantly associated with spiritual well-being and life satisfaction in pregnant women (Niaghiha et al., 2019). Severe life events, chronic strain, relationship quality, and supports from partner and family members are the strongest psychosocial predictors for postnatal depression (Yim et al., 2015).

5. Implications and limitations

This study suggests that antenatal education should become a social support medium for pregnant mothers to receive information and support from health professionals. Furthermore, the study also suggests that guided antenatal education and guidebook are beneficial in reducing the risk for postpartum depression and improving social support and life satisfaction among pregnant women, especially first-time mothers. Awareness and assessment of the risk for postnatal depression should be done in the early trimester of pregnancy and after giving birth.

There were few limitations in our study. First, we did not follow up with the patients in the long term to see the benefits of the antenatal education support programs for long-term risk of postnatal depression, social support, and life satisfaction. Second, we evaluated the effects of intervention using the self-report questionnaire. However, we used the Malay version of the questionnaire with good validity and reliability to reduce recall bias. Also, the participants did not know which group they were allocated in the study to reduce the response bias.

6. Conclusion

The antenatal education support programs help reduce postnatal depression, increase life satisfaction and social support, especially in first-time mothers. Guided antenatal education plays an important role in delivering the information, promoting good health care, and helps young mothers into motherhood life.

We suggest that a larger sample size is needed in the future studies to explore social support and life satisfaction among first-time mothers that will help in the improvement of care for pregnant mothers. Effective strategies, including educational materials and support systems as the component, may help provide effective education to reduce psychological distress, especially among first-time mothers.

Conflict of interest

The authors declare no conflicts of interest.

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Author contribution

Badrin S., contributed to plan, design and data collection of the research. Gopal, R. L. R., Noor S. R. J. involved in planning, designing and supervising the research process. Badrin S., Badrin S.

involved in data analysis and interpretations, draft and writing the manuscript. All authors reviewed the results and approved the final version of the manuscript.

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ORIGINAL RESEARCH

Indonesian Self-Risk Assessment for Cervical Cancer (SiNara): Instrument Development and Validation

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Abstract

Background: Women's ignorance of cervical cancer risk factors has caused low participation in the screening of the disease. Women can independently assess cervical cancer risk factors in themselves through a risk assessment instrument. However, no instruments were found that assessed cervical cancer risk based on the characteristics of Indonesian women.
Purpose: This study aimed to develop and validate an Indonesian self-risk instrument for cervical cancer.
Methods: The instrument was developed based on scale development following the guidelines by DeVellis (2017). A cross-sectional study was implemented to validate the instrument. A total of 20 women were involved in the pre-testing, and as many as 200 women were included in the instrument testing. Based on the scale development guidelines, data collection was initiated with a literature review to determine the instrument construct and item pool. A total of 29 articles were used in the formulation of the item pool and resulted in 38 items for validity and reliability testing. Content validity ratio (CVR) and content validity index (CVI) were used to test the content validity of the instrument, which was reviewed by three experts. Exploratory factor analysis (EFA) with principal component analysis (PCA) method and Kuder-Richardson 20 (KR-20) were used to evaluate construct validity and internal consistency reliability, respectively.
Results: A total of 26 items met the content validity and 21 items met the construct validity evaluation, with five items being removed because they had a loading factor value of <0.4. After the validity were evaluated, the instrument was reduced from 38 items to 21 items. The internal consistency reliability with Kuder-Richardson 20 (KR-20) was 0.807.
Conclusion: The Indonesian self-risk assessment for cervical cancer (SiNara) instrument is of good validity and reliability. However, it needs to be tested in other settings using larger samples to measure its psychometric properties as well as its applicability and acceptability.

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1. Introduction

Cervical cancer has still become one of the most common cancers in women in the world (World Health Organization, 2020). In Indonesia, the incidence rate of cervical cancer was 24.5 per 100,000 women in 2018, where about 32,469 new cases are diagnosed each year (International Agency for Research on Cancer, 2018). Human papillomavirus (HPV) type 16 and 18 are clearly involved in the etiology of cervical cancer (Li et al., 2011). HPV transmission can occur due to several risk factors, including sexual activity at a young age, sexual intercourse with both female and male partners, smoking, poor nutrition, low socioeconomic conditions, long-term use of oral contraceptives, multiparity, genetic factors, and sexually transmitted disease (Bassal et al., 2016; Borruto & Ridder, 2012; Chelimo et al., 2013; Khatun et al., 2018; Natphopsuk et al., 2012). Cervical cancer has an impact on women in the form of physical, psychological, sexual, social and spiritual function (Bae & Park, 2016; Bjelic-radisic et al., 2012; Pfaendler et al., 2015; Thapa et al., 2018). Various changes can be experienced by cervical cancer patients, so it is important to detect cervical cancer early through visual inspection with acetic acid (IVA), pap smear, and HPV DNA test (World Health Organization, 2014).

One of the Indonesian government's efforts to reduce cervical cancer is low-cost screening using the IVA method at the public health center (Kim et al., 2013). In fact, women's participation in cervical cancer screening is still low. In 2018, the coverage of cervical cancer screening using the IVA method was only 2,747,662 women (7.34%) (Ministry of Health Republic Indonesia, 2019). Several research results have shown various factors that influence the low participation of women to participate in cervical cancer screening. Those factors including shame, fear of pain, discomfort with the procedure, fear of the results, lacking knowledge about cervical cancer, cost, time, and lacking awareness about the importance of screening (Ghebre et al., 2015; Linadi, 2013; Nurhasanah & Afiyanti, 2017; Studts et al., 2013; Sudenga et al., 2013). Moreover, access to health facilities and lack of social support (family, husband, health workers) are factors that influence participation in cervical cancer screening (Abiodun et al., 2013; Armadhani et al., 2019). Among these various factors, lack of knowledge and public awareness about the importance of cervical screening become the most barrier factors for women to do a screening. This is evidenced by the result of a single visit approach with a see and threat program through a pilot project in six districts in Indonesia which shows that the biggest obstacle is the low level of knowledge and awareness of women about the importance of cervical cancer screening (Budiman et al., 2019).

Several previous studies have applied various interventions to increase women's participation in cervical cancer screening activities, including invitation letters, telephone calls, leaflets, booklets and multimedia (Acera et al., 2017; Lubis et al., 2015; Silalahi et al., 2018; Valdez et al., 2019). Women's knowledge increased after receiving health education but did not affect their attitudes regarding screening behavior. Attitudes related to screening barriers are self-efficacy, low perceptions of vulnerability, and confidence (Valdez et al., 2019). Poor perceptions are often the reason for the delay in accessing health services for cervical cancer patients in Indonesia (Warta et al., 2015).

Women participate in cervical cancer screening when they have a high awareness (Mingo et al., 2015). Women who realize that they are at risk for cervical cancer express their desire to take preventive measures (Rio & Suci, 2017). Thus, women need to recognize their own risk of developing cervical cancer through a cancer risk detection or a risk assessment instrument. Risk assessment is a term used to describe a process or method for identifying hazards and risk factors, analyzing and evaluating risks, and controlling risks (Canadian Centre for Occupation Health and Safety, 2017). The idea of developing a risk assessment is to predict the risk of developing cancer, so it is necessary to obtain credentials (Prendiville, 2011). Various studies have used risk assessment instruments to assess the risk of various cancers, including cervical cancer, with the results of increasing screening awareness (Ezechi et al., 2013; Rimmi et al., 2016; Schroy et al., 2013; Soans et al., 2012; Van Erkelens et al., 2017).

Cervical cancer risk assessment instruments have been developed and used both manually and online in several countries such as India, Nigeria, Canada, and New York (Cancer Care Ontario, 2019; Ezechi et al., 2013; Rimmi et al., 2016; Soans et al., 2012; University of Rochester Medical Center, 2020). Various research results show that women have more than one risk of cervical cancer and express a desire to do cervical cancer screening after knowing the risk of cervical cancer. Previous research has shown the importance of a cervical cancer risk assessment instrument to increase awareness of cervical cancer screening (Ezechi et al., 2013; Rimmi et al., 2016; Soans et al., 2012).

Several cervical cancer risk assessment instruments have been developed in other countries, yet in Indonesia. Moreover, all existing instruments were in English. There was also an instrument that has been developed according to the characteristics of women and the risk factors found in the region, such as India, which uses castes in the demographic characteristics section (Soans et al., 2012). This research was conducted to develop a self-risk assessment instrument using the Indonesian language and according to the characteristics, culture, and risk factors found in Indonesia. Thus, it is hoped that the instrument can be easily understood so that it can be used independently by Indonesian women. Therefore, this study aimed to develop the Indonesian self-risk assessment instrument for cervical cancer.

2. Methods

2.1 Research design

The instrument follows DeVellis's (2017) guidelines in developing a scale using seven stages of scale development. These stages are the identification of the construct to be measured, the

formulation of the item pool, the determination of the instrument format, the assessment of the items by the expert panel, item testing, item evaluation, and scale optimization (DeVellis, 2017). Content Validity Ratio (CVR) and Content Validity Index (CVI) were used to evaluate content validity, while exploratory factor analysis (EFA) with the principal component analysis (PCA) method was used to evaluate construct validity. A reliability test was carried out using Kuder-Richardson 20 (KR-20).

2.2 Setting and samples

Instrument testing was conducted in Bandung City, West Java, Indonesia. A total of 20 women were included in the pre-test, and the instrument was then tested on 200 women via a Google form. The sample size was determined based on the assumption that a sample size of 200 is sufficient for most cases with a factor analysis of no more than 40 items (DeVellis, 2017), and must exceed the number of items, from 2 to 20 respondents per item with a minimum number of 100 respondents (Anthoine et al., 2014). The inclusion criteria were being married, had never been diagnosed with cervical cancer and were willing to participate in the study.

2.3 Measurement and data collection

The content validity ratio (CVR) and content validity index (CVI) assessment form was used by experts to evaluate the items. The first step was developing the instrument by determining the construct through a literature review. The search for articles was carried out on the PubMed, CINAHL, Google Scholar, and Garuda databases, with inclusion criteria including the publication year of 2010-2019, using Indonesian or English, and articles were published in the Science and Technology Index (SINTA) and Scopus indexed journals. The keywords used in Indonesian were "risk factors AND cervical cancer" and in English were "risk factors AND cervical cancer AND Indonesia." A total of 29 articles met the inclusion criteria and were used in the formulation of the item pool.

The item pool was formed based on a literature review and comparison with cervical cancer risk assessment instruments from other countries. A total of 30 items were developed as the instrument. The items were women's demographic data, containing items on the number of marriages (Chandrawati, 2016; Yuliani et al., 2019), age (Fitrisia et al., 2019; Jasa, 2016), and husband's and wife's income (Chandrawati, 2016; Umami et al., 2017). Next, the disease history included a previous history of sexually transmitted diseases (Darmayanti et al., 2015; Partiwi et al., 2015), excessive white vaginal discharge, foul-smelling vaginal discharge, bleeding after menopause (Jasa, 2016; Nindrea, 2017; Trifitriana et al., 2017), history of immune system disease, and history of using immunosuppressant drugs (Borruto & Ridder, 2012). Furthermore, obstetric histories including age at marriage (Diapari et al., 2014; Sundari et al., 2017), age at first sexual intercourse (Arfailasufandi et al., 2016; Lestariningsih & Martini, 2013; Umami et al., 2017), age at first pregnancy, number of delivery (Chandrawati, 2016; Hidayat et al., 2014; Sundari et al., 2017), age at menarche and menstrual cycle (Mwaka et al., 2015; Nindrea, 2017; Walker & Hamilton, 2017) were also pooled.

Family history of disease, including family history of cancer and family history of cervical cancer (Arfailasufandi et al., 2016; Rahmah et al., 2017; Yuviska & Amirus, 2015); and lifestyle, including smoking habits, history of cigarette smoke exposure (Natphopsuk et al., 2012; Nindrea, 2017; Dewi et al., 2013; Putri et al., 2019), no daily fruit and vegetable consumptions (Rasjidi, 2009; Syatriani, 2011) were taken. Personal hygiene included no changing sanitary napkins every 4-6 hours a day during menstruation, no drying out the vagina after micturition, no washing the genital area after sexual intercourse, and using panty liners and public toilets frequently (Dianti & Isfandiari, 2015; Fitrisia et al., 2019; Dewi, 2017). Sexual behaviors which were pooled included the number of sexual partners (Umami et al., 2017; Yuliani et al., 2019), bleeding after sexual intercourse, and intercourse during menstruation (Damayanti, 2013; Nindrea, 2017). The use of contraceptives, like types of contraception and duration of using the contraceptive (Dewi et al., 2015; Fitrisia et al., 2019; Jasa, 2016; Partiwi et al., 2015); and cervical cancer prevention measures, such as the history of HPV vaccine and IVA or pap smear screening were derived (Dewi et al., 2015; Kusumawati et al., 2016; Putri et al., 2019). Factors related to husbands, consisting of uncircumcised husbands (Syatriani, 2011), number of husbands' marriages (Rimmi et al., 2016; Soans et al., 2012), husband's history of venereal disease/ HIV, and smoking (Arfailasufandi et al., 2016; Putri et al., 2019; Soans et al., 2012), were also included in the pooled items.

The instrument format consisted of risk factor items and answer choices. The answer choices included two choices, with a score of 1 (risky) and 0 (no risk). The risk answer column was red, and the non-risk answer column was green. Respondents gave a checkmark (√) according to their own risk factors. The instrument category was divided into two categories; risky and not risky. The determination of instrument categories was in accordance with the theory and literature review about cervical cancer risk factors. If there was only one factor contained in the instrument item in women, it was categorized as at risk of cervical cancer. This was adjusted to the purpose of developing instruments and in accordance with several instruments that have been previously developed using dichotomous answer choices.

Three experts consisting of psychometricians, nurses, and doctors were involved in the assessment of instrument items. All experts had had a minimum education level of master degree with a working period of >5 years, so they had qualified experiences. The assessment of items by experts used the content validity ratio (CVR) and content validity index (CVI) assessment forms. The content validity assessment was carried out in two stages with the calculation of CVR and CVI, as well as a comparison of the results of CVR and CVI (Bolarinwa, 2016). CVR was assessed using a Likert scale, divided into "1=essential", "2=important but not essential" and "3=not essential". The CVI assessment used a four-point Likert scale, including "1=not relevant", "2=content cannot be reviewed without revision", "3=relevant with minor revisions", and "4=very relevant". The I-CVI value should be 1.00 if the expert panels are five or fewer (Hendryadi, 2017). In the first stage, 9 items were not essential with the CVR of -0.33. As a result, 29 items had a positive value of 0.33-1, meaning that half the panelists considered that the items were essential/important. The CVI calculation showed that 27 items were not valid with an I-CVI value of <1 and an S-CVI value of 0.71 (71%). After comparing the results of the CVR and CVI calculations, 14 items were removed and 32 items were included in the second stage of testing. In the second stage, 6 items were removed because the CVI value did not meet the requirements of the three experts, leaving 26 items meeting the content validity, with a CVR value of 0.33-1 and I-CVI from each expert of 1.00 and S-CVI of 1.00.

The instrument with 26 valid items based on the expert judgment was tested on 20 respondents to determine the respondents' understanding of the items in July 2020. After that, it was continued with item testing on 200 respondents in August 2020. Google forms were used to test items by respondents. Next, a construct validity test was conducted on 26 items using principal component analysis (PCA). Five items were removed because the Measure of Sampling Adequacy (MSA) value was <0.5. Twenty-one items had a Kaiser Meyer Olkin Measure of Sampling Adequacy (KMO MSA) value of 0.805 (≥0.6) and an MSA value of each item of >0.5, indicating the adequacy of the sample used for factor analysis and had a strong significance with a value of Bartlett's test of sphericity of p=0.000 (p<0.05).

2.4 Data analysis

The content validity test used the content validity ratio (CVR) and the content validity index (CVI). Construct validity with principal component analysis (PCA) was conducted to explain the proportion of limited variance (shared variance) through varimax rotation analysis (DeVellis, 2017). The most recommended approach is the Kaiser and Cattell method based on the eigenvalue of 1.0 and should not be less than 1.0 because it reflects unstable factors (DeVellis, 2017). Correlation matrix analysis was used to analyze the pattern of co-variation and correlation between items through Barlett's test of sphericity with a significance value of p<0.05 and Kaiser-Meyer-Olkin (KMO) with a value of 0.6. In addition, to perform further factor analysis, an anti-image correlation item value of >0.5 was required. In the advanced factor analysis, the loading factor value of 0.40 was used as significance in defining the factor. Internal consistency reliability test was calculated using Kuder-Richardson 20 (KR-20) >0.70 (ri>0.70).

2.5 Ethical considerations

This study had received ethical approval from the Research Ethics Committee of Universitas Padjadjaran with a reference number of 466/UN6.KEP/EC/2020. Permission from the National Unity and Politics of the Bandung City Health Office was obtained before conducting the research. Informed consent was included in the questionnaire via Google form. The respondents who agreed to participate continued filling out the questionnaire.

3. Results

3.1 Content validity

Table 1 shows that after passing the item assessment process and content validity testing, the self-risk assessment instrument consisted of 26 items with a CVR value of 0.33-1, the I-CVI of each expert of 1.00, and S-CVI of 1.00.

Table 1. Content validity based on the assessment of stages I and II (item=26)

No	Items	CVR	CVI
1	Number of marriages	0.33	1
2	Age	0.33	1
3	Husband's income	0.33	1
4	Wife's income	0.33	1
5	Have experienced excessive white vaginal discharge	0.33	1
6	Have experienced foul-smelling and itchy vaginal discharge	1	1
7	Have experienced bleeding outside the menstrual period	1	1
8	Have experienced bleeding after menopause	1	1
9	Age at first sexual intercourse	1	1
10	Number of delivery	1	1
11	Have a family history of cancer	1	1
12	Have a family history of cervical cancer	1	1
13	Have a smoking habit	1	1
14	Have a history of exposure to cigarette smoke in the environment where you live or work	0.33	1
15	Have a habit of changing pads during menstruation	1	1
16	Have a habit of washing out the genital area after sexual intercourse	1	1
17	Have a habit of washing out the vagina with soap or cleaning fluids	1	1
18	Have a number of sexual partners	1	1
19	Have experienced bleeding after sexual intercourse	1	1
20	Have had sexual intercourse during menstruation	1	1
21	Have experienced complaints during the use of contraceptive	1	1
22	Have had a vaccine / HPV immunization	1	1
23	Have had an IVA or pap smear	1	1
24	Number of husbands' marriages	1	1
25	Husband has a history of venereal diseases such as gonorrhea, syphilis or HIV disease	1	1
26	Husband has a smoking habit	1	1
		S-CVI	1

3.2 Characteristics of respondents

Based on Table 2, the characteristics of respondents on item testing with the minimum age of the respondent was 19 years, and the maximum age was 66 years. Most of the respondents had a higher education level (70%) and worked as private employees (44%).

Table 2. The characteristics of respondents (n=200)

Characteristics	f	%
Age (year)		
19-28	41	20.5
29-38	78	39.0
39-48	47	23.5
49-58	21	10.0
≥59	13	6.5
Education		
Elementary School	0	0
Junior High School	9	4.5
Senior High School	51	25.5
Academic/University	140	70.0
No School	0	0

Table 2. Continued

Characteristics	f	%
Occupation		
Housewife	62	31.0
Civil Servants	27	13.5
General employees	88	44.0
Entrepreneur	5	2.5
Labor	2	1.0
Others	16	8.0

3.3 Construct validity

Table 3 shows that the factor analysis carried out on 21 items in the self-risk assessment instrument through rotated component matrix analysis resulted in six factors. First factors (items 13, 16, 18, 19, 20, 25), second factors (item 5, 6, 15), third factors (items 3, 4, 9, 23), fourth factors (items 14, 17, 26), fifth factors (items 7, 11, 12) and a factor of six (items 10, 21) had a loading factor value of each item of ≥0.4.

Table 3. Analysis of the factors of the self-risk assessment instrument (n=21)

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Factor 1						
13. Have a smoking habit	0.713					
16. Have a habit of washing out the genital area after sexual intercourse	0.404					
18. Have a number of sexual partners	0.735					
19. Have experienced bleeding after sexual intercourse	0.442					
20. Have had sexual intercourse during menstruation	0.666					
25. Husband has a history of venereal diseases such as gonorrhea, syphilis or HIV disease	0.611					
Factor 2						
5. Have experienced excessive white vaginal discharge		0.836				
6. Have experienced foul-smelling and itchy vaginal discharge		0.869				
15. Habit of changing pads during menstruation		0.551				
Factor 3						
3. Husband's income			0.794			
4. Wife's income			0.709			
9. Age at first sexual intercourse			0.538			
23. Have had an IVA or pap smear			0.434			
Factor 4						
14. Have a history of exposure to cigarette smoke in the environment where you live or work				0.784		
17. Have a habit of washing out the vagina with soap or cleaning fluids				0.576		
26. Husband has a smoking habit				0.770		
Factor 5						
7. Have experienced bleeding outside the menstrual period					0.456	
11. Have a family history of cancer					0.698	
12. Have a family history of cervical cancer					0.779	

Table 3. Continued

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Factor 6						
10. Number of delivery						0.527
21. Have experienced complaints during used contraceptive						0.671

3.4 Reliability test

Table 4 shows that the KR-20 value was 0.807 (ri>0.70), so that the self-risk assessment instrument (SiNara) was reliable.

Table 4. Kuder-Richardson 20 analysis of 21 items of self-risk assessment instrument (n=200)

Number of Items	Number of Respondents	Alpha
21	200	0.807

3.5 Optimization of scale length

Table 5 describes the items of the self-risk assessment instrument adjusted to the results of the factor analysis. Based on the results of the content and construct validity test, there was a change in the number of items from 38 items in the item pool to 21 items.

Table 5. The final results of the cervical cancer self-risk assessment instrument (item=21)

No	Items
1	Have a smoking habit
2	Have a habit of washing out the genitalia area after sexual intercourse
3	Have a number of sexual partners
4	Have experienced bleeding after sexual intercourse
5	Have had sexual intercourse during menstruation
6	Husband has a history of venereal diseases such as gonorrhea, syphilis or HIV disease
7	Have experienced excessive white vaginal discharge
8	Have experienced foul-smelling and itchy vaginal discharge
9	Have a habit of changing pads during menstruation
10	Husband's income
11	Wife's income
12	Age at first sexual intercourse
13	Have had an IVA or pap smear
14	Have a history of exposure to cigarette smoke in the environment where you live or work
15	Have a habit of washing the vagina with soap or cleaning fluids
16	Husband has a smoking habit
17	Have experienced bleeding outside the menstrual period
18	Have a family member who has been diagnosed with cancer
19	Have a female family member who has had cervical cancer
20	Number of delivery
21	Have experienced complaints during used contraceptive

4. Discussion

The purpose of this study was to develop the Indonesian self-risk assessment instrument for cervical cancer. This study showed that the Indonesian self-risk assessment for cervical cancer (SiNara) instrument had been developed, and the instrument had good validity and reliability score. Content validity test showed that there were 26 items with a CVR value of 0.33-1 and I-CVI as well as S-CVI of 1 (100%), meaning that all experts agreed that these items were valid content. The construct validity test was carried out on 21 items, because there were five items, including items 1, 2, 8, 22, and 24 omitted due to MSA values of <0.5. The varimax rotation resulted in six factors, namely factor one consisting of six items, factor two consisting of three items, factor three consisting of four items, factor four consisting of three items, factor five consisting of three items, and factor six consisting of two items. The internal consistency reliability testing was conducted

only once and then analyzed (Gray et al., 2013). The six factors had each item loading factor value of ≥0.4. The Kuder-Richardson 20 (KR-20) value showed that the instrument had good reliability on internal consistency, with the KR-20 value of >0.70 (Fraenkel et al., 2011).

The instrument, "SiNara", consists of six factors with 21 valid and reliable items. Compared to the previous self-risk assessment instrument, there were three new items produced in this study, including having a habit of washing out the vagina with soap or cleaning liquid (Dianti & Isfandiari, 2015; Fitrisia et al., 2019; Syatriani, 2011), having a history of cigarette smoke exposure in the environment where they live or work (Arfailasufandi et al., 2016; Dewi, 2017; Putri et al., 2019), and experiencing complaints during the use of contraceptive agents (Damayanti, 2013; Darmayanti et al., 2015; Nindrea, 2017; Partiwi et al., 2015). Various risk factors in the instrument can evidently increase the risks of cervical cancer, either directly or indirectly. Smoking is one of the factors that can increase the risk of cervical cancer in women in Indonesia (Nindrea, 2017). Also, exposure to cigarette smoke can increase the risk of cervical pre-cancerous lesions (Arfailasufandi et al., 2016; Dewi, 2017; Putri et al., 2019). A study showed that women with partners who smoked for 20 years with a total of 20 packs per year had an increased risk of cervical cancer (Natphopsuk et al., 2012). It can be concluded that not only active smokers who have a risk but women who were in a smoking environment can also increase the risk of being infected with HPV.

Habits of sexual activity and personal hygiene could increase the risk of cervical cancer. Some studies showed that having more than one sexual partner increases the risk of cervical cancer (Jasa, 2016; Umami et al., 2017; Yuliani et al., 2019). First sexual activity at an average age of 16 or <20 years can also increase the risk of cervical cancer (Arfailasufandi et al., 2016; Darmayanti et al., 2015; Fitrisia et al., 2019; Nindrea, 2017). In addition, personal hygiene factors such as the use of antiseptics in the genital area, rarely changing pads during menstruation, and no washing out the genitalia area after sexual intercourse can increase the risk of cervical cancer (Dianti & Isfandiari, 2015; Syatriani, 2011). Thakur et al. (2015) pointed out that poor genital hygiene is one of the risks of cervical cancer. Furthermore, several factors related to sexual activity or other disease conditions can also increase the risk of cervical cancer, including bleeding after sexual intercourse, bleeding outside the menstrual period, excessive white vaginal discharge, and foul-smelling and itchy vaginal discharge (Nindrea, 2017; Trifitriana et al., 2017).

Women with low socioeconomic status tend to have cervical cancer risk (Chandrawati, 2016; Umami et al., 2017). Socio-economic status related to nutrition is one of the factors that influence the incidence of cervical cancer (Syatriani, 2011). Most Indonesian women were known to have never done early detection of cervical cancer. This is indirectly influenced by economic status, which can be several barriers, such as inadequate access to health services and a lack of knowledge that cancer can be detected (Lee & Lee, 2017; Nurhasanah & Afiyanti, 2014; Putri et al., 2019). Another factor that could increase the risk of cervical cancer in Indonesia was genetic factors. The previous studies showed that women with a family history of cancer have an increased risk of cervical cancer (Arfailasufandi et al., 2016; Rahmah et al., 2017; Yuviska & Amirus, 2015). In addition, multiparity women were more at risk of developing cervical cancer (Arfailasufandi et al., 2016; Chandrawati, 2016; Damayanti, 2013; Hidayat et al., 2014; Lestariningsih & Martini, 2013; Sundari et al., 2017). The use of contraceptives is also a risk factor for cervical cancer. The results of the study state that the long-term use of hormonal contraceptives increases the risk of cervical cancer (Damayanti, 2013; Darmayanti et al., 2015; Fitrisia et al., 2019; Nindrea, 2017; Partiwi et al., 2015). Furthermore, the use of oral contraceptives for more than 5 years can escalate the risk of cervical cancer (Dewi et al., 2015; Jasa, 2016; Yuliani et al., 2019).

5. Implication and limitation

This study has some implications for clinical practice and nursing research. First, the Indonesian self-risk assessment instrument for cervical cancer "SiNara" has good validity and reliability to be used independently by women to detect cervical cancer. The existence of this instrument is expected to increase women's awareness to carry out early detection of cervical cancer through the IVA test or pap smear. Second, the instrument consists of three new items, which were not published previously by another researcher, and were specific to the Indonesian setting. Third, the "SiNara" instrument in the Indonesian language has relatively short items and is easy to fill out so that it can be extensively used by Indonesian women and women's health practitioners/ researchers.

This study has several limitations. The first was item pools formulation used secondary data through literature reviews, not primary data. The second limitation was no research on cervical cancer risk factors related to culture or customs. Therefore, it is still needed to develop this instrument by examining it from a cultural perspective that may increase the risk of cervical cancer. The third limitation was the sample used, which only consisted of a population that had smartphones. However, online data collection using smartphones was very helpful for research during a pandemic.

6. Conclusion

The Indonesian self-risk assessment instrument for cervical cancer "SiNara" had been valid and reliable with relatively short items and used the Indonesian language. The "SiNara" instrument is recommended for every Indonesian woman to assess the risk of cervical cancer independently. Moreover, this instrument can be used by further researchers to identify the risk of cervical cancer in women in Indonesia on a large scale. It is recommended for further researchers to use primary data besides literature review to develop more items.

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Author contribution

DM contributed to the initial conception, design, formulation of instrument items, data collection, data analysis, data interpretation, manuscript drafting, and critical revision of the manuscript. YH and TS contributed to the formulation of instrument items, selection of experts, critical writing, and revision of the manuscript. All authors approved the final version of the manuscript.

Conflict of interest

No conflict of interest in this study was declared by the authors.

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ORIGINAL RESEARCH

Work Index and Contextual Variables as Predictors of Emergency Nurses' Career Success

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Abstract

Background: The stressful work environment of emergency departments needs competent nurses to be successful in their careers. Although the work environment significantly affects nurses' quality of care and job satisfaction, studies on the relationship between the work environment and career success are still limited. Therefore, it is imperative to investigate how individual and environmental factors predict the career success of nurses in the emergency department.
Purpose: This study was conducted to identify the predictors of career success of emergency nurses based on work index and contextual variables.
Methods: This cross-sectional study was conducted in eight university hospitals in Tabriz, Iran. The career success scale and the Nursing Work Index (PES-NWI) were completed by 193 emergency nurses selected using a stratified random sampling technique. Data were analyzed using a multivariate regression analysis.
Results: The mean and standard deviation of nurses' scores were 168.59±15.54 for the career success scale (range: 39-195) and 2.64±0.48 for the PES-NWI (range: 1-4). According to multiple linear regression analysis, nursing work index and hospital type were significant predictors of nurses' career success ($R2=0.17$, adjusted $R2=0.11$, $p<.01$).
Conclusion: Nursing work index and hospital type were significant predictors of nurses' career success. Nursing managers and leaders should provide healthy work environments to help nurses increase their career success.

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1. Introduction

Career success refers to the accomplishment and success of people in their careers (Asghari et al., 2020). Career success is an important concept that leads to the improved professional behavior and outcomes (Han & Wang, 2017). Successful employees usually do a better job, need less supervision and guidance, have less absenteeism, are role models for novice employees, and make fewer mistakes while working (Asghari et al., 2019). Career success is a multidimensional concept (Li et al., 2017). Zamanzadeh et al. (2019), in a qualitative study, defined career success in nursing with the dimensions of providing high quality care, being an exemplary employee, embarking on career growth, having positive personal attributes, and being internally satisfied. Moreover, the evidence shows that nurses' career success is related to important outcomes like job satisfaction, burnout, and quality of nursing care (Dan et al., 2018a; Elmi et al., 2017).

The evidence suggests that career success is related to and influenced by individual and environmental factors (Spurk et al., 2019). Innovative behavior, self-efficacy (Dan et al., 2018b), personality traits, gender, race (Spurk et al., 2019) are personal characteristics related to career success. In a qualitative study to define the concept of career success in nursing, having positive personal attributes was one of the themes of this study (Zamanzadeh et al., 2019). In another study to develop a scale for nurses' career success, it was found that nurses' individual abilities, such as specialized knowledge and skills, had the most important load in the structure of the scale. Effective self-regulation personality trait was also another subscale in this scale (Asghari et al., 2020).

Existing studies show that not only individual factors but also work-related factors affect career success. Societal norms like salary, job level, promotion history, or job prestige (Spurk et al., 2019) and environmental factors like relationship with co-workers and having the necessary equipment and facilities to do the job are among work-related factors that impact career success

(Sönmez et al., 2021). In addition, resources that support coping with expected and unexpected challenges and harms are considered critical to achieving career success (Spurk et al., 2019). The work environment has a significant impact on the career success of nurses in the emergency department in Han and Wang's (2017) study. Furthermore, Wang et al. (2019) indicated that career success is related to the work environment in nurses with a master's or doctoral degree. In their study, hierarchical regression analysis showed that the work environment positively correlates with career success for three of the four subscales.

The working environment of the emergency department is more complicated than that of ordinary departments, with a wide range of patients, many severe illnesses, rapid changes in patient's conditions, and a heavy nursing workload. It is necessary to rescue critically ill patients and deal with emergencies, which leads to high mental stress and a long-term overload of nursing staff (Chang et al., 2020; Fitriana et al., 2021). The turn-over rate is high, and patients' conditions are usually complex (Han & Wang, 2017). In addition, heavy workload and shortage of emergency nurses are among the most common stressors in this department (Alahmadi & Alharbi, 2018; Portero de la Cruz et al., 2020). Nurses' interest in work and job satisfaction is affected in these departments, leading to burnout and reduced satisfaction (Han & Wang, 2017). A study in Iran showed that more than 60% of emergency nurses have moderate levels of burnout, stress, and job dissatisfaction (Tavakoli et al., 2018). In addition, research has shown that there is a higher incidence of secondary traumatic stress symptoms in emergency nurses. Its identified risk factors include repeated exposure to trauma, death, chronic stressors, and work pressure (Vand Tamadoni et al., 2020). On the other hand, the stressful work environment of emergency departments needs competent nurses to be successful in their careers.

Improving nurses' work environment has been recommended as an effective strategy to increase the opportunity to provide quality care and remedy nursing shortages by promoting nurses' job satisfaction (Albashayreh et al., 2019; Portero de la Cruz et al., 2020; Tavakoli et al., 2018). Although the nursing work environment has been reported to affect nurses' job satisfaction significantly, studies on the relationship between the work environment and career success are still limited (Wang et al., 2019). Therefore, it is imperative to increase our understanding of how individual and environmental factors predict the career success of nurses in the emergency department, so research into career success can expand, and, with this, organizational shift into helping nursing staff achieve career success in their practice. This study was conducted to identify the predictors of career success among emergency nurses based on work index and contextual variables.

2. Methods

2.1 Research design

A cross-sectional study was conducted to identify the predictors of career success among emergency nurses based on work index and contextual variables.

2.2 Setting and samples

The study population was nurses working in the emergency departments of eight university hospitals in Tabriz, Iran. Inclusion criteria were nurses having at least six months of experience in the emergency department and providing direct care to the patients. Scales with ≥10% missing answers to survey questions were excluded from the study (Grove et al., 2012). It should be noted that in Tabriz, nurses should have at least a bachelor's degree to work in a hospital. At the time of the study, the total numbers of nurses working in the emergency department of the studied hospitals were 278, of whom 270 were eligible. Using Krejcie and Morgan's table (Adam, 2020), the minimum sample size was 159 people. We considered a 30% probability of attrition rate; hence, the research tools were distributed among 207 nurses.

The sampling was conducted using a stratified random method. All hospitals were included in the study, and each hospital was considered one stratum. The sample size of each stratum was proportionate to the population size of the stratum. The nurses' code was then written, and the samples were selected randomly.

In this study, from the 207 distributed questionnaires, however, 14 questionnaires were not completely filled (with more than 10% incomplete items); therefore, they were not included in the analysis. Thus, finally, 193 questionnaires were included in the data analysis.

2.3 Measurement and data collection

Data collection lasted from February to April 2021. After obtaining permission from the authorities, the researcher introduced himself to the nurses and explained the study's objectives. Next, the researcher asked nurses to complete pen-and-paper questionnaires with enclosed sealable envelopes including background characteristics, the Nurses' Career Success Scale, and the Practice Environment Scale of the Nursing Work Index (PES-NWI). Those are free to the public.

The nurses' career success scale developed by Asghari et al. (2020) was used to measure nurses' career success. It consists of 39 items and four subscales: *Expected Career Progress* with 15 items, *Providing Quality Care* with 10 items, *Effective Self-Regulation* with 9 items, and *Person-Organization Fit* with 5 items. The response to each item was based on a 5-point Likert scale ranging from 1 = never to 5 = always. Total scores were generated by summing the scores of all items. The range of scores on this scale was between 39 and 195; the higher scores indicate a higher level of career success. The validity and reliability of this scale have been assured in a previous study by Asghari et al. (2020) with a Cronbach's alpha coefficient of 0.93 and excellent average content validity (CVI=0.92, Range: 0.80-0.98).

The PES-NWI was used to measure nursing work environment conditions. This tool consists of 31 items with 5 subscales: *Nurse Participation in Hospital Affairs* (9 questions), *Nursing Foundations for Quality of Care* (10 questions), *Nurse Manager Ability, Leadership and Support of Nurses* (5 questions), *Staffing and Resource Adequacy* (4 questions), and *Collegial Nurse-Physician Relations* (3 questions). The answer to each item is scored based on the 4 points Likert scale ranging from completely agree (score 4) to completely disagree (score 1). The average score of items was calculated for each subscale and the total score. The range of scores in each subscale and the scale was 1 to 4 (Lake, 2002). The validity and reliability of the Persian version of this scale have already been assessed in a past study. In which, Cronbach and Pearson alpha coefficient for the whole instrument and the extracted factors was 0.70 to 0.96. (Elmi et al., 2017).

2.4 Data analysis

Data analysis was performed by SPSS version 16 (SPSS Inc Chicago, IL, USA). The normal distribution of data was confirmed by Kolmogorov – Smirnov test. The relationship between career success with contextual variables and PES-NWI was investigated by the t-test, ANOVA, and Pearson correlation coefficient. A p-value <0.05 was considered statistically significant.

An initial simple linear regression analysis was also performed to evaluate the potential factors associated with nurses' career success. Furthermore, the potential independent variables (p<0.1) (Kleinbaum et al., 2013) such as work experience in nursing, work experience in the current unit, hospitals, and total score of PES-NWI were put into a multiple linear regression model.

2.5 Ethical considerations

This study was conducted after obtaining ethical approval from the Regional Ethics Committee of Tabriz University of Medical Sciences (Ref. IR.TBZMED.REC.1399.729). The purpose of the study, voluntary participation and confidentiality of data were explained to nurses, and the participants signed a paper informed consent form.

3. Results

3.1 Characteristics of the respondents

The mean age of nurses was 32.43±5.97 years (ranged from 22-54 years). The nurses' work experience in the nursing profession and the emergency department was 8.73±5.97 and 4.62±4.20 years, respectively. Nurses worked an average of 28.80±4.22 shifts per month. Table 1 shows other background characteristics of the participants.

3.2 The relationship between career success and other variables

The mean and standard deviation of nurses' scores were 168.59±15.54 from the career success scale and 2.64±0.48 from PES-NWI. The mean scores of each subscale are shown in Table 2.

Table 1. The personal and occupational characteristics of nurses (n=193)

Variable	f	%
Gender		
Male	122	63.2
Female	71	36.8
Marital Status		
Single	80	41.5
Married	113	58.5
Education		
Bachelor	173	89.6
Masters	20	10.4
Shift		
Fixed	14	7.3
Rotational	179	92.7
Hospital		
General 1	58	30.1
General 2	29	15.0
Pediatric	21	10.9
Cardiac	17	8.8
Gynecology 1	6	3.1
Gynecology 2	9	4.7
Ophthalmology 1	4	2.1
Ophthalmology 2	8	4.1
Psychiatric	22	11.4
Orthopedic	19	9.8

Table 2. Career success and PES-NWI subscales (n=193)

Scale	Subscales	Mean	SD	Range of Score	
				Min	Max
Career Success					
	Expected Career Progress	62.74	6.34	40	75
	Providing Quality Care	45.8	4.42	28	50
	Effective Self-Regulation	38.44	4.01	26	45
	Person-Organization Fit	22.33	2.69	14	25
	Total Career Success	168.59	15.54	108	193
PES-NWI					
	Nurse Participation in Hospital Affairs	2.58	0.56	1	4
	Nursing Foundations for Quality of Care	2.69	0.48	1	4
	Nurse Manager Ability, Leadership, and Support of Nurses	2.65	0.58	1	4
	Staffing and Resource Adequacy	2.53	0.59	1	4
	Collegial Nurse-Physician Relations	2.77	0.57	1	4
	Total PES-NWI	2.64	0.48	1	4

The relationship between career success with contextual variables and the PES-NWI is presented in Table 3. According to the results, career success showed a statistically significant relationship with the variables of age (p<0.05), type of hospital (p<0.02), and subscale of Nursing Foundations for Quality of Care of the PES-NWI scale (p<0.05).

3.3 Predictors of emergency nurse' career success

Multiple regression analysis was used to predict the career success of nurses. By controlling for independent variables such as demographic and work-related characteristics, factors including PES-NWI and type of hospital were significant predictors of the nurses' career success (R2=0.17, adjusted R2=0.11, p<0.01). The results showed that 19% of the variance changes in nurses' career success could be explained by the total score of the PES-NWI (β=0.19, p<0.01). The findings also showed that working in some specialty hospitals (Gynecology, Neurology, and Orthopedic) was associated with higher career success (Table 4).

Table 3. The relationship between career success with background characteristics and PES-NWI (n=193)

Predictors	Statistics	*p*-value
Nurse participation in hospital affairs	r=0.98*	0.17
Nursing foundations for quality of care	r=0.13*	0.05
Nurse manager ability, leadership and support of nurses	r=0.13*	0.06
Staffing and resource adequacy	r=0.11*	0.10
Collegial nurse-physician relations	r=0.09*	0.17
Total PES-NWI	r=0.09*	0.09
Gender	t=-1.07**	0.94
Marital status	t=-1.30**	0.20
Education	t=-0.64**	0.52
Shift	t=1.48**	0.14
Hospital	F=2.21***	0.02
Age	r=-0.97*	0.05
Work experience	r=0.79*	0.07
Work experience in emergency department	r=-0.58*	0.11
Number of shift per month	r=0.42*	0.15

* Pearson; ** t-test; *** ANOVA

Table 4. Results from multivariate regression analysis of nurses' career success (n=193)

Independent variables	B	SE	Beta (β)	*p*-value	95% CI for B	
					Lower	Upper
(Constant)	148.34	6.57		<0.01*	135.38	161.31
Work experience in nursing (years)	0.164	0.299	0.063	0.58	-0.43	0.75
Work experience in the current unit (years)	0.564	0.424	0.153	0.18	-0.27	1.40
Hospital						
General 1	0.88	3.73	0.02	0.81	-6.49	8.25
General 2	7.44	4.08	0.14	0.70	-0.61	15.49
Pediatric	-3.30	3.36	0.14	0.33	-9.93	3.32
Cardiac	-0.33	6.30	-0.01	0.96	-12.76	12.09
Gynecology 1	15.069	7.607	0.138	0.04*	0.06	30.08
Gynecology 2	4.66	5.56	0.06	0.40	-6.30	15.63
Ophthalmology 1	10.535	5.259	0.143	0.04*	0.16	20.91
Ophthalmology 2	-6.30	3.82	-.13	0.10	-13.83	1.23
Psychiatric	-10.10	4.14	-.19	0.02*	-18.26	-1.94
Total score of PES-NWI	0.20	0.07	0.19	0<.01*	0.06	0.35

Note. R2=0.17, adjusted R2=0.11, SE=14.66, F (12, 148) =2.99, $p<0.01$.
Dependent variable: Nurses career success; PES-NWI=Practice Environment Scale of Nursing Work Index, *$p<0.05$

4. Discussion

This study aimed to identify the predictors of career success among emergency nurses based on the work environment index and contextual variables. The mean and standard deviation of nurses' career success in this study was 168.59±15.54 (range: 39-195). Since no cut-off point has been set for the nurses' career success scale (Asghari et al., 2020), this number cannot be judged qualitatively. However, this finding probably indicates that the samples in this study are not far from ideal career success. For example, in a study by Asghari et al. (2020), who used the same scale to evaluate the career success of 530 nurses, the mean and standard deviation of work success was 139.14±12.82. In another study in China, the average career success scores of 848 emergency nurses from 12 hospitals was 31.42±5.60 (range:18-50) (Han & Wang, 2017). Comparison of these findings shows that in studies whose research population was nurses working in all clinical wards, career success is less than the present study's findings, the target group of which is nurses working in the emergency department. In other words, the career success of emergency nurses seems to be higher than the average of nurses working in other settings.

Nurses' scores on all subscales of career success were higher than the median score except for the *Effective Self-Regulation* subscale. In another study on nurses of all clinical wards with the

same instrument, participants' scores in all fields except *Providing Quality Care* were lower than the median (Asghari et al., 2019). Although it is not possible to make a more accurate judgment due to the lack of a cut-off point for subscales, it seems that emergency nurses meet *Expected Career Progress* and *Person-Organization Fit* of career success more than other wards. Since the work environment of the emergency department is special and complex, it is necessary for the nurses who work there to have special competencies, knowledge, and skills (Shahbazi et al., 2018). In other words, *Providing Quality Care* and having *Expected Career Progress* are of the essential characteristics of emergency nurses, which also enriches the criteria for career success.

The results of the current study showed that the average score of the PES-NWI was 2.64± 0.48 (range: 1-4). This relatively moderate score indicates the unsatisfactory working conditions of the nurses working in the university hospitals. Similar to these results, the score of PES-NWI for 327 nurses was about the median (2.59±0.45) (Kapucu et al., 2017). In a systematic review, this score for non-magnetic hospitals was 2.51-2.92, for emerging/aspiring magnet was 2.62-3.07, and for magnet hospitals were 2.92-3.00 (Swiger et al., 2017). This about the median scores of PES-NWI highlights the need for authorities to provide urgent treatment to improve nurses' working environment, especially in critical wards such as the emergency department.

In the current study, the highest score obtained in the PES-NWI was related to the subscale of *Collegial Nurse-Physician Relations* (2.77±0.57), and the lowest score was related to the subscale of *Staffing and Resource Adequacy* (2.53±0.59). In other words, nurses perceive collegial nurse-physician relations and the foundation for quality of care as the most desirable dimensions of the work index. This is consistent with a similar study in Oman (Albashayreh et al., 2019) and United Arab Emirates (Al-Maaitah et al., 2018). Such findings may be attributed to the availability of multidisciplinary teamwork encouragement standards and the existence of quality systems recognized by health care quality accreditation in study settings (Albashayreh et al., 2019). In contrast, nurses perceive staffing and resource scarcity as the least desirable aspects, which agrees with a recent systematic review of 46 studies from 28 countries (Swiger et al., 2017), suggesting that in Iran, the global problem of nursing shortage is a problem.

Using regression analysis to predict nurses' career success showed that 19% of nurses' career success variance could be explained by the total score of the PES-NWI (β=0.19, p<0.01). A study by Wang et al. (2019), using hierarchical regression analysis, showed that the work environment has a positive relationship with the career success of nurses with a postgraduate degree in three out of four subscales (Wang et al., 2019). Thus, an appropriate work environment is a determining factor for career success and the quality of care (Copanitsanou et al., 2017).

Among the contextual variables, only the type of hospital (gynecology and ophthalmology) could predict the variance of career success. Since all employment and wage conditions are similar in all hospitals; this finding strengthens the relationship between work index and career success. It shows how important is the work index in nurses' career success. Similar to our results, another study conducted in Iran to predict nurses' career success showed that none of the demographic characteristics could predict nurses' career success (Asghari et al., 2019). This finding contradicts the results of previous studies, which believed that both individual and environmental factors affect career success (Spurk et al., 2019). For example, age is one of the demographic characteristics that is considered an important variable related to career success (Sönmez et al., 2021; Spurk et al., 2019). In this study, age could not predict changes in career success variance. However, the age range of our sample was wide (ranged from 22-54 years). Remarkably, it was found that the elderly population is exposed to age-related stereotypes and assesses their abilities (and consequently career success) lower than young people (Praskova & Johnston, 2021). Further, "beginners" address the development of professional and task-related skills as key elements in increasing their employability, while older workers understand that their employment increases with opportunities to expand expertise in adjacent / different fields (Zamanzadeh et al., 2019). This may influence the definition of career success for adults in different stages of age. Although career success is important at every stage of adult life, the focus and motivation of a career may depend on whether one is preparing for the future career or it is the transition to another stage (Praskova & Johnston, 2021). Future studies are needed to explore this in more detail.

5. Implications and limitations

The findings of the study have several implications for nursing. About the implications of the study for nursing research, this study highlights the importance of the work index in nurses' career success in health care organizations. Moreover, this study constitutes the primary data for future local and national studies. In addition, it reinforces the research findings if future research involves a qualitative approach that examines other health care professionals' readiness for improving work index and increasing career success. For practical implications, this study provides information to health care policymakers and leaders seeking to improve emergency departments' work index and respond to organizational change efforts. Nursing managers are the key to improve the workplace of healthcare centers to promote positive outcomes for organizations, patients, and nurses. Future efforts to improve career success in nurses of emergency departments need to improve the practice environment and reduce harassment in the workplace. In terms of social implications, it is important to know how well health care professionals, especially nurses, understand the impact of the work index on career success and why a particular work index is important in implementing change to increase career success.

Although this is one of the first studies in this field, it also has some limitations. One of the limitations of the study was the length of scales that had to be completed. Accordingly, it is recommended that a shortened form of these tools be developed in future research. Another limitation is the nature of the concept of career success. Career success is a multidimensional concept that in this study has been examined only with a self-report. It is suggested that other methods of data collection be used in future research, such as observing or asking officials and colleagues.

6. Conclusion

According to the findings, although nurses showed acceptable career success, they perceived the workplace condition unsatisfactory. In addition, the study showed that nurses' work index could influence nurses' career success. Therefore, nurse managers and leaders should improve work environments to help nurses obtain a higher level of career success. Moreover, this study indicates the need for further studies on the career success of emergency nurses and changes in the work environment to increase the career success of nurses, especially emergency nurses.

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Author contribution

EA: Study design, study supervision, manuscript writing; AM: Data collection, manuscript writing; MG: Data analysis, manuscript writing.

Conflict of interest

The authors declare no conflicts of interest.

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ORIGINAL RESEARCH

Transitional Experiences from Clinical Nurse Experts to Novice Nurse Lecturers in the University for Local Development in Thailand: A Phenomenological Study

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Abstract

Background: Nurse lecturers play a vital role in producing professional and competent nurses through teaching and practicing in universities. It is challenging for clinical nurse experts to adapt to being nurse lecturers in the university for local development. Exploring this transitional experience is essential to learn how nurses adapt themselves to their new roles.
Purpose: This study aimed to describe the transitional experiences from clinical nurse experts to novice nurse lecturers in the context of the university for local development.
Methods: The Heideggerian hermeneutic phenomenology was used as a research methodology. The purposive sampling was utilized to select eight novice nurse lecturers as participants. Data were ethically collected using in-depth interviews, observations, field records, and voice recordings. The collected data were then transcribed verbatim, and a thematic analysis based on van Manen's method was applied for data analysis.
Results: The findings showed five major themes and four sub-themes, including: (1) Reasons for becoming a nurse lecturer in the university for local development, consisting of having a successful career and desiring to serve the community in their hometown; (2) Learning to work by relying on themselves; (3) Learning and teaching through an offered service for local development; (4) Seeking support, consisting of focusing on students as moral support and asking for recommendations from colleagues; and (5) Confidently moving forward.
Conclusion: Understanding transitional experience from clinical nurse experts to novice nurse lecturers in the university for local development is very challenging, especially in managing difficulties in the role transition. It is expected that nursing schools provide an effective orientation and mentorship programs to help nurse lecturers promote their role transition efficiently.

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1. Introduction

Presently, the nursing staff and lecturer shortage is a global issue that many countries are facing, including Thailand (American Association of Colleges of Nursing, 2020; Portia, 2019). Thailand has been attempting to solve this issue at a national level by launching many policies, including policies aimed at retaining nurses in the healthcare system. However, due to several factors such as the increasing needs for healthcare caused by an aging society, the complexity of new diseases, the welfares, job satisfaction, and career development, keeping people in the healthcare field has not been as easy as expected (Alotaibi et al., 2016; Artsanthia & Pomthong, 2018; Gunn et al., 2018; Hariyati et al., 2017; Hoffman, 2019). The quantity and quality of healthcare demands are an ongoing global issue for nurse administrators, clinical nurses, and nurse lecturers (Grainger, 2021; Khunthar, 2014).

Nurse lecturer plays one of the most important roles in producing nurses to serve society. However, there are not enough nurse lecturers to teach nursing students at a suitable lecturer per student ratio. The ratio for a full-time nurse lecturer equivalent to a student at this moment is not

more than 1:6 (Gazette of Thailand Nursing and Midwifery Council, 2019). Therefore, Thailand's capacity to produce nurses is not in line with society's needs (Aroonsang et al., 2012). Also, the Thai Nursing and Midwifery Council (Gazette of Thailand Nursing and Midwifery Council, 2019) has determined that the qualifications for a full or part-time nurse lecturers in colleges or universities should be at least a master's degree in nursing or a program related to the subject matter being taught (Bureau of Policy and Strategy Ministry of Public Health, 2017). These requirements mainly help to clarify the basic qualities that nurse lecturers should have to do their job efficiently.

From all above, it is important to remember that nursing faculties have to deal with a variety of job descriptions, which can be directly or indirectly connected to the teaching, such as teaching both in the theoretical and practical fields, conducting research, or even providing academic services (Bureau of Policy and Strategy Ministry of Public Health, 2017). Moreover, it should be considered that nurses need to do urgent jobs without any preparation, which can ultimately cause stress. Therefore, the nurse lecturers need more time to prepare nurses to be ready for any activities through their teaching, research, or the provision of academic services. These abilities are important because higher education aims to produce human resources who are competent in any professions (Roongruangsri & Sngounsiritham, 2015). Consequently, one of the most important responsibilities of a nurse lecturer is advising and coaching nursing students to fulfill their potential as professional nurses (Mthiyanee & Habedi, 2018). As a result, it is argued that nurse lecturers play a crucial role in offering a successful nursing education focusing on producing professional and competent nurses for the society.

However, in order to teach students, the transitional experience from a clinical nurse to a nurse lecturer is a complex process and, unfortunately, involves a long period of self-adapting. Thomas et al. (2019) reported that chronic stress due to various reasons such as employment requirements, working in an understaffed environment, and lack of support could cause nurse faculty burnout which leads to resignation. A study highlighting this transitional experience by Raetong (2012) showed that former nurse practitioners felt stressed, anxious, nervous, bored, exhausted, and confused with their new roles. On the other hand, they felt happy when getting any positive reinforcement such as praise, and felt pride and gratitude toward their parents as they were able to experience the joys of working as nurses. Because of this experience, during the nursing role transition, they had solutions to deal with any situations, which helped them understand situations better, accept mistakes and difficult moments, become self-reliant and confident enough to seek any advice, and release tension so that they would not have to endure any psychological problems (Raetong, 2012). Besides, this experience also taught them how to deal with unpleasant behaviors of colleagues when faced with uncertainty about them as novice lecturers to be able to fulfill one's academic expectations, difficult challenges, time limitations, and unfriendly behavior from senior colleagues (Heydari et al., 2015). Therefore, it is strongly believed that the role transition from clinical nurses to nurse lecturers needs to be made easier and improved appropriately through the provision of a focused assignment. In addition, the nurse lecturers should, at the same time, be a qualified person, so the recruiting process must be focused on evaluating the educational qualifications, work experience, personal potential, personal attitude, and more (Summawart, 2000). For example, the nurse lecturers need to have knowledge and experiences related to their teaching subject, which they can share with their students. Their knowledge should be in line with the learning outcomes. Nurse lecturers should demonstrate that they can cultivate their students to be competent nurses, so that the needs of society can be fulfilled efficiently. Another reason why the nursing role transition is important is that if the nurse lecturers cannot adapt themselves to their new roles, even if they are an expert in nursing, they may face reality shock and burnout respectively (Summawart, 2000).

As aforementioned, the differences in roles between clinical nurse experts and nurse lecturers are obvious. It is, therefore, challenging for clinical nurse experts to adapt to being nurse lecturers in the university for local development. If they cannot overcome the adaptation process, it leads to stress, anxiety, and confusion (Kuewong & Oumtanee, 2017; Owens, 2017). Consequently, they would probably quit the nursing educational system, which contributes to the shortage of nurse educators, and as a result, the nursing students will not be taught by nurse lecturers who will share one's rare and valuable knowledge, skills, and attitudes. Accordingly, this study aimed to describe the transitional experiences from clinical nurse experts to novice nurse lecturers in the context of the university for local development. It is expected that this study could provide insight

for nursing administrators, nursing lecturers, and clinical nurses to develop plans and guidelines for supporting clinical nurses in their role transition to be nurse lecturers in the university for local development.

2. Methods

2.1 Research design

A qualitative study was conducted using a Heideggerian phenomenological hermeneutic method (Heidegger, 1962) to describe the transitional experiences from clinical nurse experts to novice nurse lecturers in the context of the university for local development in Thailand. As phenomenology is an exploratory approach, it does not seek to achieve either reliability or validity among a broad population group since it typically uses a small sample (Polit & Beck, 2004).

2.2 Setting and participants

This study was carried out in a university for local development in the northeast of Thailand. Purposive sampling was used to select nurse lecturers as participants at the beginning of sample selection. Then, snowball sampling was applied after each interview to obtain the least of participants. Eight participants were selected based on the inclusion criteria. The inclusion criteria were as follows: (1) the participants had to have been working at the university for local development in the northeast of Thailand for at least one year; (2) they first started to work as nurse lecturers at the university for local development in the northeast of Thailand; (3) nurse lecturers had more than five years of clinical nurse experiences; and (4) they were also willing to participate in the study. The number of participants in this study was determined based on the level of redundancy. After eight participants, there was no new data emerging, or data saturation was reached; therefore, the researchers stopped the data collection.

2.3 Data collection

As a first step, a research draft was sent to an ethical review committee and the dean of the faculty of nursing to ask for approval. Then, the researchers contacted the first participant who met the criteria and informed the participant about the purpose and method of the study. Next, the researchers and participant made an appointment for an interview at the participant's convenience. Data were ethically collected from 10 January until 30 June 2020 by face-to-face interviews for four participants. The rest were interviewed using video conferencing platforms due to the implementation of remote working strategy by the Thai government during the COVID-19 pandemic. The in-depth interview was conducted by starting with general questions to establish trust and followed by unstructured questions. The main questions included; "What were your inspirations of transitioning your career from being a clinical nurse to be a nurse lecturer?", "How do you feel when you first started in your role as a nursing lecturer?", "How can you adapt yourself into your new role?", and "Do you have anything else that you would like to share with me?" The main questions were asked and were answered through storytelling by the participants until enough information was collected. The interview took 45-60 minutes each time, and 1-2 rounds were held for each participant in which demographic data and field notes were recorded. Participants were also asked for permission to contact further if there was a need to re-interview them at a later date in order to clarify information and ensure the researchers had interpreted their words correctly.

2.4 Data analysis

The collected data were analyzed using the van Manen's thematic analysis method to be summarized into sub-themes and main themes from the lived experiences (van Manen, 1990). The researchers followed six steps of van Manen's approach (van Manen, 2015), including: (1) Turning the nature of lived experience by formulating the research question of this study; (2) Investigating the participants' experience using an in-depth interview with unstructured questions; (3) Reflecting on the essential themes by listening carefully to the recordings repeatedly, and reading carefully for verbatim transcription to develop initial themes; (4) Describing the phenomena in the art of writing and rewriting by re-reading the initial themes and constant revising and refining thought; (5) Maintaining a strong and oriented relation to the phenomenon by striving to remain focused on the research questions; and (6) Balancing the research context by considering the parts and the whole themes by isolating thematic statements

to develop final themes that represent the lived experience. Subsequently, the themes were reflected upon, and the phenomena were done manually.

2.5 Trustworthiness

Trustworthiness is important to increase confidence that the study findings reflect the participants' perspectives (Guba & Lincoln, 1994). As suggested by Guba and Lincoln (1994), various strategies were used to enhance the trustworthiness of the study findings, as follows: (1) Credibility: after a verbatim transcription had been created between the interviewee and the researcher, the researcher sent the transcripts back to all participants so that the content could be checked. The participants confirmed that what was in the transcription was a fair account of what was covered, and no revisions were needed. Furthermore, the analyzed findings were proved by three experts who were members of nursing faculties and had the experience of conducting qualitative research, and their findings were expressed in a peer debriefing. Some minor suggestions made the findings more complete after revision; (2) Transferability: the researcher carefully completed the findings by analyzing the information and including all data; (3) Dependability: the researcher used several tools to collect data such as a voice recorder, demographic data, and field note record forms to make sure that all data that was collected and recorded; and (4) Conformability: systematic data collection and analysis were used and that data was then checked and compared as part of an audit trail.

2.6 Ethical considerations

Informed consent was obtained both orally and in written from all participants. The researcher was committed to keeping their personal information, interview data, and anonymity confidential. Their identities were kept confidential using the nurse lecturer coding given to the participants based on the interview order. This study was approved by the Research Ethics Committee of Roi Et Rajabhat University. The certification number was 019/2562.

3. Results

3.1 Characteristics of participants

The participants included eight nurse lecturers. One-half of the participants were in the 30-40 age group while one was in the 41-50 age range, and three were in the 51-60 age range. All participants were female and graduated with at least a master's degree. The participants' years of clinical nurse experiences ranged from 6 to 25 years, and their nurse lecturer experiences ranged from 1 to 10 years, as can be seen in Table 1.

Table 1. Demographic characteristics of the participants (n=8)

Demographic characteristics	f	%
Sex		
Male	0	0
Female	8	100
Age (years)		
30-40	4	50
41-50	1	12.5
51-60	3	37.5
Educational background		
Master degree	8	100
Clinical nurse experience (years)		
1-10	4	50
11-20	1	12.5
>21	3	37.5
Nurse lecturer experience		
1-5	3	37.5
6-10	5	62.5

3.2 Emerging themes

The findings consisted of five major themes and four sub-themes, as presented in Figure 1.

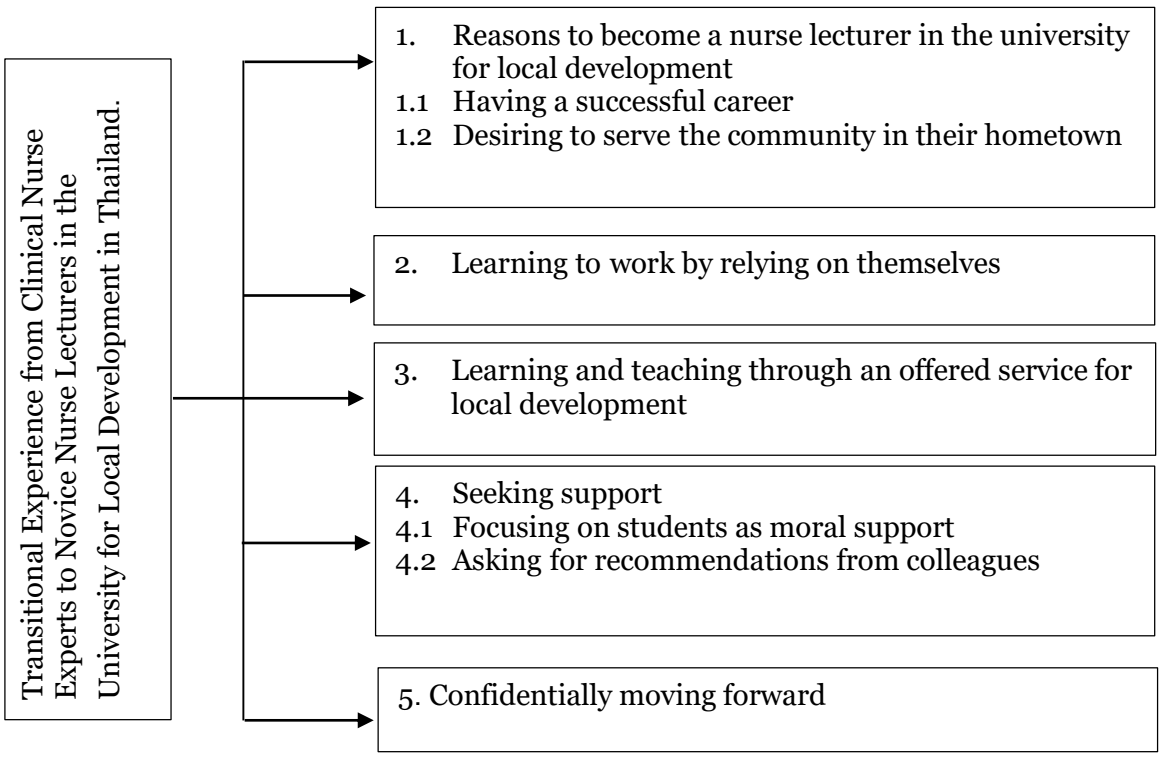

Figure 1. The major themes and sub-themes among the findings

The findings regarding the transitional experiences from clinical nurse experts to novice nurse lecturers in the university for local development in Thailand were presented as follows:

3.2.1 Reasons for becoming a nurse lecturer in the university for local development

Making a crucial decision to be nurse lecturers was an important turning point in the life of clinical nurses. There were two main reasons why they decided to be nurse lecturers as stated below:

3.2.1.1 Having a successful career

After applying to become nurse lecturers at the nursing faculty, the nurses automatically became university staff members without having to be put on any waiting list compared with the other faculties' staff members. A nursing academic career had a clear pathway to success because there was no limit on the available number of positions. Moreover, nursing faculties did not need to compete with other colleagues to get into a higher position. Therefore, people could qualify to become nurse lecturers based on their academic performances, research, and nursing education experiences as long as they had been meeting the national criteria. Hence, it meant that a successful career was possible if people realized their potential.

> "...When working as a clinical nurse before, I was stuck on the 7th level of the career ladder, and I couldn't achieve a higher level because there was no available position. At that time, my salary was limited even while I continued to work there, and my salary did not increase. In contrast, if I work as a nursing lecturer, the salary will be increased every year. If I am hardworking and my qualifications are accepted, I can level up for an academic position. It truly depends on my potential..." (Participant 2)

> "...If I work here as a nursing lecturer, I can immediately become a permanent member of the university's staff while this would not be possible for staff members from another faculty. This is the benefit of being a nurse lecturer here, and it's motivating because I am provided

with the opportunity to get an academic position. There is no limitation, as it all depends on my potential…" (Participant 3)

3.2.1.2 Desiring to serve the community in their hometown

Many clinical nurses would like to be nurse lecturers because they had a passion for serving the community in their hometown. Therefore, they decided to be nurse lecturers to teach the local nursing students to be competent nurses to serve their hometown passionately. They wanted to teach and cultivate the nursing students through their knowledge, skills, experiences, and ethical points of view holistically and professionally.

"…I have a lot of knowledge, skills, and experiences to deliver to the next generation. I want to share them and be their role model. By teaching novice nursing students, I believe it is the best choice to cultivate a proper practice and culture of working focused on morals and ethics to provide competent nurses. Furthermore, I am of the thought that producing good nurses is the best way that I can serve my hometown. This is because I believe that before my retirement, I have to return all that I have learned and gained in life to society, especially my hometown…" (Participant 1)

"…I want to be a teacher here because I want to be a part of serving the community in my hometown. I am qualified to be a nursing teacher because I have graduated with a master degree and I love to work in an academic field…" (Participant 7)

3.2.2 Learning to work by relying on themselves

At the start of learning something new or changing to a new role, sometimes the nurse lecturers at the nursing faculty had to learn about their work by themselves because there was not a stable system yet that instructed them how to teach and do their jobs. Therefore, they had to apply their knowledge to work in their working environment. Moreover, some nurse lecturers took courses by themselves so that they could understand the Thai Qualification Framework for Higher Education (TQF) [TQF is a framework and document used in Thailand to store information about the upcoming courses as evidence to ensure transparency and maintain the efficiency of teaching and learning management with the goal of improving the quality of learning and learned; TQF1-6]. In addition, some nurse lecturers learned to teach nursing students in the practicum field by evaluating themselves and their students every day and writing about their students' performances in their notebooks by writing a summary of their performances and providing them with grades. On the other hand, other nurse lecturers learned to teach by using student-centered techniques by listening to their nursing students' voices and providing them with knowledge according to the students' needs and TQF 4 [TQF4 was a document about a field or practical learning experience which includes general information about the subject, the subject's propose, the subject content and operation, academic performance development, lesson plans, and evaluation methods, teaching resources, and methods of evaluating and improving the quality of the learning experience].

"…The faculty system is not stable yet. No one has trained me to teach. I enrolled to study in the faculty of education and strenuously had to do this by myself. I received a 1-year educational certificate and teaching certificate from the faculty of education. I learned about the curriculum and how to teach courses. When I studied, I just thought that I needed TQF1, TQF2, but I learned that it could also be TQF3, 4, 5, or 6, respectively. I know more about them now, but the problem, at the beginning, was that no one helped me with my training, and no one was taking care of me…" (Participant 1)

"…I did not have a teaching model for all processes in the practicum field. I had to rely on myself to teach the nursing students. I evaluated myself and my students every day and wrote important points about the students' performance in the notebook so that I could summarize their performance and lastly gave them a grade. I used student center techniques, and I provided them with knowledge according to the students' needs and TQF 4. I could do it, but I was quite slow. I felt when no one could come to guide me; it was unfair to the students as they should be learning from a confident teacher…" (Participant 4)

3.2.3 Learning and teaching through an offered service for local development

The nurse lectures had to work following the strategies of the university, which were focused on local community development based on the creation of local development strategies to encourage local community participation. These strategies are aimed at developing elderly caregivers so that they could collaborate with the villagers to take care of their community. Besides, the strategies also cover providing healthcare officials to people of all stages of life from birth to death holistically. The examples range from arranging training programs for health volunteers so that they would know how to take care of children in the community, to training programs for teenagers so that they would know how to take care of older adults empathically by being a trainer or supervisor. To achieve this, the nurse lecturers need to establish a good relationship with healthcare professionals at the health-promoting hospitals, health volunteers, community leaders, and villagers to ensure that the programs are developed collaboratively and sustainably. Meanwhile, the nurse lecturers needed to teach the nursing students to learn from these community development programs through "service learning." The "service learning" program was a type of teaching and learning which mixed both academic and practical components by encouraging the students to learn from a real situation while developing their community.

> "…Besides teaching, I have to develop the community based on the university's strategies. For instance, I had to see the director and staff of the health-promoting hospital near our university. I also needed to work with the health volunteers in the community because I had to deal with them to arrange the development of a program that focused on training the caregivers of older adults, which would encourage them to take care of older adults in their community. I had to deal with these caregivers until the end of this project, so maintaining a good relationship with them was important to establish trust and become part of a harmonious community…" (Participant 2)

> "…My nursing students also participated in the local development activities based on the strategies of our university. For example, the students demonstrated and taught people to do exercise in the community and held awareness campaigns about dengue fever. They were taught this before utilizing the theory they had been taught in the community step by step, which is also known as integrated learning by doing in real life what they had been taught about developing or improving their communities…" (Participant 8)

3.2.4 Seeking support

When obtaining a role in the nursing faculty, there were many obstacles that nurse lecturers had to encounter, especially regarding the work that they had not done before. Therefore, learning and understanding the tasks which became their responsibility was what matters most. For that reason, the nurse lecturers used many approaches to improve themselves, understand the contexts nursing students might face in the future, and recognize their responsibilities. There were two sub-themes to the seeking support option as shown below;

3.2.4.1 Focusing on students as moral support

In the adaptation period, a new nurse lecturer had to learn about the work, the people, and also the culture of the organization and know how to deal with problems. Sometimes when there was a problem that affects the teaching, it could make a nurse lecturer feel tired, but looking at the students and thinking about what the students would gain from their role, might encourage them to keep going. Additionally, lively and innocent students have made their moral support to do their work. This led to some nurse lecturers choosing the way not to care about events that could not be changed, such as unfriendly senior colleagues, but it did make them change their vision of how they saw the world by having positive thoughts and improving themselves each day to teach their students satisfactorily.

> "…I used to suffer from an unclear way of how my classes were audited as my lecture was occasionally interrupted by senior nursing staff members of the faculty, which made my class not run smoothly, and I felt so upset. Despite this, the students were the reason why I wanted to stay here at the nursing faculty since they were lively and supported me even if I was not

good at teaching. Sometimes they gave me moral support by cheering me up during my lecture or paying attention in class as they knew I was nervous. When I looked at their shining eyes, it made me want to try harder as I felt I had become a nurse lecturer here to teach them to be good nurses, so they were my inspiration at times…" (Participant 5)

3.2.4.2 Asking for recommendations from colleagues

Starting to work in a new role was not that easy, so asking for recommendations from colleagues could help nurse lecturers to understand better because some colleagues might have a lot of experience.

"…My colleague always advised me to find a way to calculate the grades and create a Thai qualification framework (TQF). Even though I tried it by myself first, if I could not do it, I would ask my colleague to teach me…" (Participant1)

"…If there was a task or a context that I did not understand yet, I would always ask my colleague who was my friend since she had more experience than me. My colleague used to be a secretary of the chancellor, and as the way the paperwork had to be done and very strict guidelines, I would ask her for help with the paperwork…" (Participant 6)

3.2.5 Confidently moving forward

Working as a clinical nurse required a different working style compared to working as a nurse lecturer. This was because a clinical nurse would try to save lives and care for people every day and finish that duty at the end of each day. Meanwhile, a nurse lecturer would do academic work endlessly. Therefore, it was important that the nurse lecturers learned to adapt themselves and understand their role so that they could manage their time to have a good work-life balance and a better quality of life by learning how to do their work more smoothly. Some of them said that when working as nurse lecturers, they might be faced with obstacles sometimes, but if they looked at them as challenges, they could fix any situation. These adaptations could lead them to be more confident to work smoothly at the nursing faculty.

"…When being a clinical nurse and taking care of patient's lives, the duty is finished once their shift has finished. They only had to deal with problems during their working time, but this was different for a teacher as they had many other responsibilities to fulfill. For example, I worked as a member of the student development committee. Therefore, there would be more responsibilities as I had to take care of the students from the first orientation day until they graduate. When they had any problems, including family, study, or financial problems, I was the person who tried to help my students to overcome all their obstacles as much as I could. This is an endless cycle…" (Participant 2)

"…Once I gained more understanding about the roles at the nursing faculty, I knew how to improve myself academically and fulfill my research requirements. I felt happier involving myself in academic services and playing a part in preserving the national arts and cultures. After adaption period I can do exercise and sleep properly…" (Participant6)

"…I was so excited for my first class, so I had prepared everything completely. For my second class, it was a lot better because I had more confidence. After a year passed, I understood almost everything, I knew how to teach, to train my students, and manage my schedule to conduct my research and provide service-learning. When I was faced with obstacles, I looked at them as challenges enabling me to learn from any situation and fix any issues…" (Participant 5)

4. Discussion

The study found five major themes and four subcategories. They were reasons to become a nurse lecturer in the university for local development, learning to work by relying on themselves, learning and teaching through an offered service for local development, seeking support, and confidentially moving forward.

4.1 Reasons to become a nurse lecturer in the university for local development

This study showed that there are many reasons to become nurse lecturers in the university for local development, including having a successful career and desiring to serve the community in one's hometown. Likewise, Al-Qahtani et al. (2020) showed that the career ladder contributes to the job satisfaction of nurses. Similarly, Halstead and Frank (2017) noted that an academic career in nursing education as a nurse lecturer is a very rewarding career to have as successful career. In addition, nurse lecturers had the most respected educators on campuses of higher education. Being a nurse lecturer to serve the community in one's hometown can reach and maintain self-esteem. The finding is relevant that people strive to feel good or seek to maintain self-esteem, which is fundamental to human nature (Yang et al., 2016).

4.2 Learning to work by relying on themselves

This study confirms that during the transition period, novice nurse lecturers learn to work by relying on themselves, and lacking support can be a reason for nurse lecturer burnout (Thomas et al., 2019). Transitions from the clinical nurse role to nurse lecturers need effective self-adaptation. Otherwise, they might be confronted with culture shock even if they have worked as an expert clinical nurse before. Kuewong and Oumtanee (2017) also noted that new nurses faced stress when they started working in a new role in the intensive care unit. This might result in having some pressure, feeling unconfident, or burning out, which can cause them to leave their job. On the other hand, if the clinical nurses have studied to do or have been trained to teach the nursing program, they may have more understanding of teaching in nursing science both theoretically and practically. They may also have more confidence to work as a nurse lecturer. Likewise, Cooley and De Gagne (2016) mentioned that to stop these barriers, an internship could facilitate the characteristics of transformative learning experiences. Internship programs are believed to be a necessary link that can be used to create academic environments that contribute to the development of competence in a novice nurse lecturer. This is related to a study by Chargualaf et al. (2017) which argued that the transition from military nurses to nurse lecturers included acknowledgment of the reality of the academic culture, appreciation for the journey that was needed to be made to bridge the gap, and the culmination of a new identity to survive the new role. Therefore, the recognition of this transition and the strengths that these nurses can offer shows the necessity for focused orientation programs to increase the retention of new nurse lecturers at the faculty.

4.3 Learning and teaching through an offered service for local development

This study revealed that nurse lecturers must learn and teach through an offered service for local development. When working as nurse lecturers, the lecturers face several responsibilities, which might make it difficult to do their unfamiliar job in the beginning. Moreover, they have to come up with projects to develop the local community according to the university's mission, and strategies focused on the socio-economic, environmental, and educational development of their society, so that any issues can be solved continuously and sustainably (Dapong, 2018). Similarly, the nurse lecturers should follow the university's strategies to develop the local community by collaborating with the villagers to gain sustainable development (Thanisorn, 2018). So, Nurse lecturers need to learn how to adapt themselves to build a strong relationship with the people in their community. Besides, community-based research focusing on community strength stated that an ideal situation for the development of community collaboration between the lecturers, faculties and the members of the community was required so that they could work together to focus on certain issues in the community directly in order to create real sustainability (Pavida & Duangkamol, 2019). Thus, it can be said that local development is one of the nurse lecturers' responsibilities, and it is necessary for them to deliver practical improvements so that the university can contribute to social and sustainable regional development. Importantly, service learning should be implemented, which is the process of teaching through the collaboration of the educational institutes, students, and community through which they all work on activities that contribute to changes in the community. This offers students the opportunity to learn from real situations, and the educational institutes are able to pass on knowledge to the community in aid of their sustainable development. However, it is important to note that this learning method requires a good relationship between the educational institute and the community. It also needs to be monitored continuously by listening to feedback and analyzing the results systematically

because the main responsibilities of the university as the educational institute are producing competent students and providing academic services to society (Thaneenat, 2018). It is obvious to see that the nurse lecturers need to have a good relationship with the community when teaching students and providing academic services based on the university's mission and strategies.

4.4 Seeking support

When former nurses start to work in their new role, they need to adapt themselves psychologically. Therefore, they need to adjust their perspectives toward teaching, coaching, and training. As the study of nursing role transition from a head nurse to a nurse manager shows, it is important to possess psychological readiness to face any issues, and lecturers should be able to manage those problems wisely (Charoengid & Oumtanee, 2017). It is similar to a study by Svastdi-Xuto and Wangsukpisan (2019), that investigated the transition experiences of initial clinical nursing students. They found that before gaining professional experience, the students felt anxiety, worry, and stress. However, when they tried to face the challenges during practical assignments, they felt challenged, which pushed them to learn from their friends, teachers, fellow nurses, and most importantly, their practical experiences on the ward, which ultimately helped them gain more understanding about the professional nurse job role. Additionally, nurse lecturers have their students be encouraged and their colleagues to guide their work. This is similar to Mower (2017) who found that socialization with peers and other people in the organization will be helpful to new educators. Likewise, Elizabeth (2018) noted that inadequate peer support was a barrier to successful transition across practice and academic settings. However, Hunt (2018) found that getting support from a mentor could help the new nurse educators to face a transition period into the academic setting smoothly. Importantly, without mentoring, these nurse educators might not have remained in academia. This is similar to Summers (2017) who reported that orientation programs, mentor support, clarity about role expectations, and ongoing feedback on performance during the transition period were necessary for academic organizations to retain excellent nurse educators in the university.

4.5 Confidentially moving forward

The results of this study found that after the new nurse lecturers were able to adapt themselves to work confidently, they would try to improve themselves in terms of knowledge, skills, and experiences. Transitions represent opportunities rather than losses (Patterson, 2020). In addition, Budin (2017) noted that confidence comes from feelings of well-being, acceptance of body and mind, and belief in one's own ability, skills, and experience. Therefore, when people follow these aspects of self-development, they might feel confident and happy to work when adapting to a new role which can increase the effectiveness of the nursing education system.

In addition, after moving through the transition period from clinical nurses to nurse lecturers, the stress and anxiety will be released, and they will feel more satisfied with their job. This is in line with Baker and Alshehri (2017), they reported that the stress factors were highly correlated with job satisfaction. Job satisfaction is an essential component of improving job performance and maintaining the overall work quality in any organization. It is well established that persons who are satisfied with their job tend to be more creative and innovative for better organizational performance (Sapkota et al., 2019). Moreover, job satisfaction results from the work-life balance, contributing to a healthy, happy, and successful life (Kasbuntoro et al., 2020; Soomro et al., 2018).

5. Implication and limitations

This study provides interesting findings that are vital to understanding the phenomenon of the role transition from clinical nurse experts to novice nurse lecturers in the university for local development. Considering the various obstacles that clinical nurse experts experienced in their transition to novice nurse lecturers, it is essential for nursing school administrators to provide an effective orientation and mentorship program to promote the role transition efficiently.

This study has limitations. It was conducted at a local development university in Thailand, which has a specific cultural context. In addition, the experience of novice nurse lecturers at general universities and private universities was not explored in this study. Therefore, the findings might not be transferable beyond the local development context. Therefore, further studies might

be conducting by developing the plan and guidelines to support clinical nurse experts in their role transition to be new nurse lecturers effectively.

6. Conclusion

This study showed that the transitional experiences from clinical nurse experts to novice nurse lecturers in the university for local development is very challenging for both nursing administrators and lecturers due to the role transition. Learning to work with a community is needed to complete the university for development's mission for sustainable community development. Consequently, effective training and orientation or mentorship programs will be beneficial to support new nurse lecturers to prevent issues such as stress, anxiety, and confusion so that community development can be enhanced. Moreover, after they have passed the phase of adapting themselves and have readily learned how to improve themselves, they can work with confidence. Consequently, it is an important determiner in the nursing role transition as it either pushes the clinical nurses to give up on becoming nurse lecturers, or, on the other hand, may encourage clinical nurses to become nurse lecturers in the university for local development. Thus, the effectiveness of the university's support to the nursing role transition can significantly increase the quality and quantity of nurse lecturers to produce competent nurses for society and lead to a successful transition.

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Author's contribution

BW, the principal investigator and corresponding author, performed the research design, data collection, data analysis, drafted and revised the manuscript. LP, co-researcher, was involved in literature review and data collection. CN, co-researcher, was involved in data collection and revision of the manuscript. CS, co-researcher, was involved in data analysis and revision of the manuscript. All of the authors have approved the submitted and published version of this manuscript.

Conflict of interest

There is no conflict of interest to declare in this study.

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ORIGINAL RESEARCH

Factors Affecting the Implementation and Barriers to Evidence-Based Practice among Nurse Practitioners in Hail Region, Saudi Arabia

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Abstract

Background: While previous studies explored the implementation and barriers to evidence-based practice (EBP), there is a dearth of literature on the causative factors such as demographics that affect the implementation and barriers to EBP.
Purpose: This study aimed to investigate the factors affecting the implementation of EBP and determine its barriers as perceived by nurse practitioners.
Methods: This study employed a quantitative correlational design. A total of 228 staff nurses from the hospitals in the Hail region, Saudi Arabia, participated in this study through purposive sampling. The evidence-based practice questionnaire (EBPQ) and the barriers scale questionnaire were used to collect the data between June and July 2020. The descriptive statistics, t-test, and analysis of variance (ANOVA) were used to analyze the collected data.
Results: The nurses showed a positive attitude (x=15.25±5.07), good knowledge (x=63.44±19.81), as well as good application of EBP (x=28.02±6.68) with an outstanding EBP score of 106.73 out of 168. Nurses' civil status (p<0.02), nationality (p<0.05), highest degree (p<0.01), job title (p<0.001), and years of experience (p<0.001) significantly affected the implementation of EBP. Also, the biggest barriers to EBP were: "No time to read research" (94.3%), "Research is not readily available" (97.8%), "Not capable to evaluate the quality of research" (90.4 %), and "Uncertain whether to believe results" (68.4%).
Conclusion: Nurses have a positive attitude, good knowledge, and good application of EBP. Civil status, nationality, highest degree, job title, and years of experience were causative factors to EBP. Nurses in hospitals should undergo training continuously to be able to use EBP effectively.

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1. Introduction

Evidence-based practice (EBP) in healthcare can improve the expected quality of care, thus reducing the disparity in giving care and cost (Melnyk & Fineout-Overholt, 2015; Melnyk et al., 2012). As such, healthcare providers, despite their complex roles, are expected to implement EBP for better outcomes in healthcare. From its former definition of using the present findings to decide which patient care is best (Sackett, 2000), the concept of EBP has been expanded to include a lifelong problem-solving approach in how healthcare is delivered, and this integrates the best evidence from high-quality studies, such as the clinician's expertise, patient's preferences, and their values (Melnyk & Fineout-Overholt, 2015).

Research suggests that nurses are not prepared to adopt EBP and rarely employ innovative knowledge (Renolen et al., 2018; Stokke et al., 2014), which could be due to several underlying factors and barriers. These factors and barriers could fetter their adoption, leaving the nurses unmotivated to implement EBP. Some of the most documented barriers for nurses in using EBP are negative perceptions, time inadequacy, and lack of knowledge and skills (Mallion & Brooke, 2016). Therefore, addressing these problems is assumed to influence the nurses to use EBP in their profession. Indeed, when supported by nursing education and their organizations, nurses can apply EBP (Ozdemir & Akdemir, 2009), and thus nursing leadership is contributory to EBP

application (Harper et al., 2017). Equally, the implementation of EBP is complemented by effective execution and enabling context (Chien, 2019).

Earlier studies have explored the implementation and barriers of EBP. For example, Stokke et al. (2014) found that nurses lack familiarity concerning the principles of EBP, thereby employing EBP to a lesser extent. Further, the lack of time, skills, motivation to evaluate research and implementing the results in practice were found as barriers to EBP implementation (Chummum & Tiran, 2008), which can transpire equally at the level of individual and organization (Khammarnia et al.,2015). While previous studies explored the implementation and barriers to EBP, there is a dearth of literature on the causative factors such as demographics that affect the implementation and barriers. For instance, Dalheim et al. (2012) found that the lack of time, unhelpful physicians, limited resources, and lack of access to information were the major hurdles highlighted in their investigation. While nurses are in a unique position to promote and support EBP in clinical settings, they have the opportunity to enhance their knowledge and skills (Malik et al., 2015). However, nurses face many challenges in EBP application, and thus, factors influencing EBP implementation need to be evaluated (Farokhzadian et al., 2015). To Swito et al. (2021), the use of evidence-based practice (EBP) as an ideal problem-solving strategy was one of the elements in improving the quality of health services, and this has been influenced by a number of factors (e.g., support of nurses' unit leader and colleagues). Moreover, there has not been any study in the Hail region of Saudi Arabia that has researched the barriers to the implementation of EBP. However, some scholars have indicated that nurses may vary in their preparation for evidence-based practice (Saunders et al., 2016), despite recommendations from research findings.

Addressing the changing demographics in the nursing profession can be assumed as key to implementation and reconciling the barriers. Exploring the barriers to EBP among nurse practitioners lays the groundwork for nursing leaders to create strategies to help nurses toward effective implementation of EBP; when implemented, the safety and quality of healthcare are ensured. This study aimed to investigate the causal factors that affect the implementation of EBP and determine its barriers as perceived by nurse practitioners.

2. Methods

2.1 Research design

This study employed a quantitative cross-sectional approach to determine the causal factors that affect the implementation of EBP and its barriers as perceived by nurse practitioners.

2.2 Setting and samples

This study was conducted among nurses from the hospitals in the Hail region, Kingdom of Saudi Arabia. The number of samples was determined through the Raosoft sample size online calculator (Raosoft, 2004) using a 95% confidence level. The inclusion criteria were set to nurses who (a) had undergone EBP workshop training as part of their continuing professional development; (b) could understand and write English; (c) and joined the orientation for this study. The exclusion criteria included the following; (a) nurses who were newly hired before the data gathering, and (b) nurses who were absent or on leave during the time of data gathering. The purposive sampling was used with the consideration that participants in the study started implementing the EBP in their units. Of the 237 distributed questionnaires, only 228 participants returned the completed questionnaires resulting in a 96.2% response rate.

2.3 Measurement and data collection

A survey using Google Forms was used to collect the data. Prior to data collection, an orientation to the participants was conducted to explain and inform them about the study, expectations, study purpose, risk and benefits, and voluntary participation. The orientation was personally conducted by the researchers per unit of the hospitals. The Google link was sent to the head nurses of each unit of the participating hospitals. The head nurses, in turn, sent the link to those staff nurses who had started implementing EBP in their unit. The data were collected between 20 June and 30 July 2020.

The Evidence-Based Practice Questionnaire (EBPQ) by Upton and Upton (Upton & Upton, 2006) and the barriers scale by Funk et al. (1991) were used in this study with their permission. The EBPQ consists of a 24-item statement with three subscales rated on a seven-point Likert scale

with responses ranging from 1 (poor/never) to 7 (best/frequently). The attitude has 4 items with a minimum score of 1 and a maximum score of 28, knowledge with 14 items having 1 as the minimum and 98 as maximum scores, and use of EBP with 6 items with 1 as minimum and 42 as the maximum scores. The rating is computed by adding the response value of each question with 168 as the overall score. According to Upton and Upton (2006), higher score indicates a more positive attitude toward EBP as well as better use and knowledge of EBP. The item in the attitudes had a couple of opposing statements with a negative and a corresponding positive statement. Using these statements, the respondents were asked to rank their attitudes toward EBP. Accordingly, if the score was greater than four, the response was deemed positive.

The barrier scale comprises 29 items with 4 characteristics, including (a) organizational characteristics with 8 items, (b) characteristics of the adopter with 8 items, (c) characteristics of communication with 6 items, and (d) characteristics of innovation with 6 items. Moreover, an additional one item was included. This barrier scale is rated on a four-point scale (1=no extent, 2=to a little extent, 3=moderate extent, and 4=to a great extent). To identify the relevance of the factors presenting as top barriers, the percentage of respondents choosing the moderate and great extent categories was calculated, then rank-ordered, with 1 representing the top barrier,

The English version of the original developers of the questionnaires was used in this study. The content and cultural sensitivities of the questionnaire were examined. There were four validators; two of them were specialists in the field of nursing education, and the other two were from clinical practice. All four experts agreed that all of the items appear to measure and are appropriate for the topic at hand. The content validity index (CVI) of the EBPQ questionnaire has resulted in 0.88 for relevance and 0.87 for clarity, while the barrier scale has 0.86 for relevance and 0.89 for clarity, which means the questionnaires are highly valid. Prior to using the questionnaires, a pilot test was conducted on 15 nurses. For the EBPQ, it has Cronbach's alpha value of 0.89 and a total Cronbach alpha value of 0.88 for the barrier scale.

2.4 Data analysis

SPSS Version 21 (IBM Corp., Armonk, NY, USA) was used to analyze the data. Frequency and percentage were used to determine the demographic information of the staff nurses and barriers to EBP. A t-test was used to compare the gender differences and nationalities, while age, civil status, number of children, highest degree, job title, and years of experience were treated with a one-way analysis of variance (ANOVA).

2.5 Ethical considerations

The Ethics Review Board of the Ministry of Health, Hail region, Saudi Arabia, approved this study (number H-2016-0058). Written consent was obtained from the respondents before answering the questionnaires. The researchers explained and informed the participants about the study, expectations, study purpose, risk and benefits, and voluntary participation during the orientation prior to joining the study.

3. Results

3.1 Demographic characteristics of nurses

Of the 228 participants, a little over half (55.7%) belonged to the age group 30-39 years, with 54.5% females. Over half (55.7%) of the participants were married, with 45.6% having no children, and more than half (57%) were not Saudi nationals. Most of the participants had bachelor's degrees (77.2%) and belonged to the staff nurse positions (85.1%). Furthermore, 36.4% of the participants belonged to the 4-6 years of experience group (Table 1).

3.2 EBP implementation as perceived by the respondents

The results of the study showed that the nurses had a positive attitude (15.25), good knowledge (63.44), and good application of EBP (28.02). Overall, the nurses had an outstanding EBP score of 106.73 out of 168 (Table 2).

3.3 Differences in EBP scores of the respondents across their profile

Nurses' age (F-Value=2.00; p=0.11), sex (t-value=−1.82, p=0.70) and number of children (F-value=1.06; p=0.37) were not causal factors for implementing EBP in the workplace. However, civil status (F-value=3.83; p=0.002), nationality (t-value=−1.98; p=0.05), highest degree (F-

value=4.05, *p*=<0.001), job title (F-value=16.38; *p*=<0.001), and years of experience (F-value=16.38, *p*=<0.001) were found significant. Post-hoc Tukey test was conducted on the following demographic factors showing the following results: civil status of participants showed that married nurses scored higher, nationality showed that non-Saudi nurses had better scores, years of experience showed that those with seven years of experience and more scored the highest, job title showed that the title of staff nurse had the lowest score, and highest degree showed that those with master's degrees had a better score (Table 3).

Table 1. Demographic characteristics of nurses (n=228)

Variable	Frequency	Percentage
Age (years old)		
20-29	77	33.8
30-39	127	55.7
40-49	21	9.2
50-59	3	1.3
Gender		
Male	33	14.5
Female	195	54.5
Civil status		
Single	96	42.1
Married	127	55.7
Widowed/ Separated	5	2.2
Number of children		
None	104	45.6
1	64	28.1
2	31	13.6
3 and above	29	12.7
Nationality		
Saudi	98	43.0
None Saudi	130	57.0
Highest degree		
Diploma	38	16.7
Bachelor	176	77.2
Master	10	4.4
Doctorate	4	1.8
Job title		
Staff Nurse	194	85.1
Head Nurse	21	9.2
Supervisor Nurse	13	5.7
Years of experience		
Less than 1 year	19	8.3
1-3 years	56	24.6
4-6 years	83	36.4
7 years and more	70	30.7

Table 2. EBP implementation score as perceived by the respondents (n=228)

Variable	Mean	SD
Attitudes towards EBP	15.25	5.07
Knowledge of EBP	63.44	19.81
Use of EBP	28.02	6.68
Total	106.73	27.09

3.4 Perceived barriers to evidence-based practice

Table 4 presents the perceived barriers to using EBP. For the organizational factors, the biggest barrier was "Does not have time to read research" (94.3%), for the communication, the biggest barrier was "Research is not readily available" (97.8%), and for the adopter, the biggest barrier was "Not capable to evaluate the quality of research" (90.4 %). Lastly, for the innovation, "Uncertain whether to believe results" (68.4%) was the biggest.

Table 3. Differences of EBP scores of the respondents across their profile (n=228)

Variable	Mean±SD	Test value	p-value
Age	6.4 ±5.02	F (2.00)	0.11
Sex	6.42 ±5.02	t (-1.82)	0.70
Civil Status	6.1 ±3.60	F (3.83)	0.002*
Number of Children	6.02 ±3.62	F (1.06)	0.37
Nationality	5.87 ±3.64	t (-1.98)	0.05*
Highest Degree	5.92 ±3.64	F (4.05)	0.001*
Job Title	5.9 ±3.65	F (16.38)	0.001*
Years of experience	5.89 ±3.64	F (6.21)	0.001*

Notes. SD=Standard deviation; F=One-way analysis of variance; t=Independent sample t-test; *Significant at 0.05

Table 4. Perceived barriers to evidence-based practice (n=228)

Perceived factors	f	Moderate or great barriers (%)	Rank
Organizational Factors			
Insufficient time on the job to implement new ideas	211	92.5	6
Does not have time to read research	215	94.3	3
Does not have authority to change patient care	210	92.1	7
Other staff not supportive of implementation	107	46.9	29
Physicians will not cooperate with implementation	201	88.2	10
The nurses do not have time to read the research	213	93.4	5
Facilities not adequate	200	87.7	12
Administration will not allow implementation	207	90.8	8
Communication			
Relevant literature not compiled in one place	195	85.52	14
Statistical analysis is not understandable	199	87.3	13
Research is not readily available	223	97.8	1
Research not reported clearly or readably	214	93.9	4
Implication for practice not clear	216	94.7	2
Research not relevant to nurses practice	202	88.6	11
Adopter			
Unaware of research	190	83.3	15
Not capable to evaluate the quality of research	206	90.4	9
Isolated from knowledgeable colleagues	189	82.9	16
Feels benefits of changing practice are minimal	158	69.3	19
Unwilling to change/try new ideas	188	82.5	17
No documented need to change practice	175	76.8	18
Sees little benefit for self	150	65.8	21
Does not see the value of research for practice	149	65.4	22
Innovation			
Research has not been replicated	112	49.1	28
Uncertain whether to believe results	156	68.4	20
Literature reports conflicting results	117	51.3	27
Research not published fast enough	128	56.1	26
Research has methodological inadequacies	130	57.0	25
Conclusions drawn from research not justified	135	59.2	24
Additional item			
The amount of information is overwhelming	140	61.4	23

4. Discussion

This study aimed to determine the causal factors that affect the implementation of EBP and its barriers as perceived by nurse practitioners. In this study, nurse practitioners were found to have an outstanding score on EBP; they also showed a positive attitude, good knowledge, and good application. Such findings can be credited to the fact that the nurse practitioners surveyed for this study understood the importance of EBP, acknowledged the need for applying it, and had already started implementing EBP in their daily routine. Indeed, nurses recognize integrating EBP activities into daily clinical care has the potential to increase EBP adoption and involvement. As such, having acknowledged that they have a positive attitude, good knowledge, and good

application of the EBP allows them to apply credible evidence to particular client situations. These findings are consistent with earlier studies. For example, along with a positive attitude, the participants also had an average level of knowledge (Mehrdad et al., 2012; Panlican et al., 2020). Indeed, in a previous study, it was found that the participants' attitude toward EBP was more positive than their knowledge/skills and adoption of EBP (Shafiei et al., 2014). Similarly, Alqahtani et al. (2020) found that participants in their study obtained average scores on the practice and attitude to EBP.

Nurses' age, sex, and the number of children were not causal factors in implementing EBP in the workplace. In other words, age, gender, and the number of offspring of the participants are not barriers to executing EBP. These factors can be used to strategize to influence the knowledge, attitudes, and practices of nurses towards EBP implementation. In this study, the majority of the respondents were females below the age of 40 years and did not have any children, which, it is believed, did not influence the implementation of EBP. In the study by Fu et al. (2020), it was found that young nurses were much more ready to implement EBP and that they were more than receptive to engaging in new things such as the implementation of EBP. Conversely, evidence-based practice has been reported to practice more by female nurses than male nurses (Aburuz, 2017), and that one of the causal factors that nurses tend to miss out excellence in their practice was dependent on the number of nurses' offspring (Alshammari et al., 2020).

Civil status, nationality, highest degree, job title, and years of experience were found to be the factors towards the implementation of EBP. This means that these factors, once addressed, play a significant role in the success of EBP implementation. In relation to civil status, it could be that married couples have a lifestyle that promotes mutual security and support (Alsaqri et al., 2020), protecting nurses from developing impersonal, cynical, and negative attitudes toward colleagues in the workplace, thus making it a predictor of EBP. Another study similar to this one supports this finding (Cañadas-De la Fuente et al, 2018). The findings of this current study likewise show that nationality predicts the implementation of EBP. This implies that the nationality of the nurses and their values and beliefs are associated with the extent to which EBP is implemented. However, earlier studies have suggested that nurses were acquainted with the EBP concepts irrespective of their role as professional, practice environment, and their nationality. Indeed, regardless of nationality, nurses' implementation of best evidence integrated into their delivery of care stayed mostly primordial (Ammouri et al., 2014; Stokke et al., 2014).

The highest degree or level of education was also found to be a factor in implementing EBP. It was found in this study that nurses with master's degrees scored better. This could be attributed partially to the fact that nurses with higher degrees had greater opportunities to use evidence-based practice in their daily undertakings. However, researchers have suggested lower barriers to the delivery of EBP for nurses with bachelor-level nursing education (Ammouri et al., 2014). Moreover, it has also been found that diploma-nursing degrees do not amply accentuate research procedures and EBP training compared to the bachelor's degree in nursing (Al-Busaidi et al., 2019). Further, lack of exposure to nursing and language of research could also be significant obstacles for nurses in practicing EBP (Novrianda & Herman, 2019), which can be observed in fresh graduate nurses. In the same way, nurses who had joined EBP training deemed themselves more efficient in incorporating EBP into their practice (Majid et al., 2011). The level of education is an important component in shaping the perception of individuals, including that of nurses. Therefore, a higher level of education results in greater knowledge and skills and the aspiration to apply them at their workplaces (Oyoh et al., 2017).

Results from this study suggest that nurses' years of experience are a factor in the implementation of EBP. This indicates that nurses with more years of experience are expected to implement EBP, credited from their training. Conversely, Al-Busaidi et al. (2019) showed that the utilization of EBP in clinical practice was done less confidently by the new nurses because of their lack of firsthand knowledge. This finding can serve to tailor educational strategies to improve the EBP implementation and utilization for new nurses. Further, the findings of this study indicate that job title could predict the application of EBP. This means that advanced nursing positions such as nurse practitioners, clinical nurse specialists, or nurse educators had substantially greater EBP beliefs and thus greater likelihood of implementing EBP. Nursing mentors, given their longer years of experience and higher levels of education, are linked with higher EBP beliefs and higher chances of implementing EBP (Kim et al., 2016). This highlights the need to focus EBP training on those who are in the beginning stages of their career.

Concerning barriers to using EBP under the organizational factor, nurses asserted that they have no time to read research. This is because of the nature of their work, where most of the time, nurses were at the bedside and doing documentation. Such a result held true with Thompson et al. (2006) and Mathieson et al. (2019) claiming that the major obstacle to EBP engagement and implementation is the lack of time. The nurse managers in this context need to strategize and look for a way for the nurses to read the research. This study finding indicates a need for support from the managers as this can be a key enabler for nurses to implement evidence-based in their practice. For the communication barriers, nurses reported that research is not readily available. Such a result may be credited to the non-availability of the literature on the internet, and most of the available literature was in abstract form when searched. This result is consistent with the previous finding where published research is not found (Kajermo et al., 1998). Conversely, nurses claimed that they are not capable of evaluating the quality of research. Such a result is possible because the integration of evidence-based practice into the nursing curriculum is still in its early stages, and the majority of the nurses in our study got their EBP information only through their professional development training. In fact, the difficulty of nurses to evaluate the quality of research can be understood from the context or gap in the communication between the academic and practice settings. Indeed, this gap has been identified as a theme from the interdisciplinary barriers that affect the practice of EBP (Shayan et al., 2019). Lastly, nurses were uncertain whether to believe results which made them hesitant to integrate evidence-based in their practice. This result, however, disagrees with Shifaza et al. (2014), where more than half of the participants believed that being uncertain whether to believe results was not a barrier. Overall, the results of EBP barriers highlight the need for administrators and policymakers to recognize that these identified barriers must be a part of nurse's continuing professional development.

5. Implication and limitation

The causal factors and barriers from this study point to obstacles that prevent the full and effective implementation of EBP among practicing nurses. This implies that there is an urgent need to identify the needed interventions and tailor them to the requirements of the nurses in a strategic plan for proper and effective implementation of EBP among nurse practitioners in Saudi Arabia. Such a plan, if executed successfully, will provide the nurses the appropriate environment to implement EBP and thereby appreciate and recognize the value of EBP in their daily work. In addition, addressing the factors identified in this study can engage nurse practitioners in research, which will increase their capacity to appraise the value and authenticity of various sources. Further, the findings of this study provide the policymakers with various perspectives to incorporate the essential factors in the early stages of EBP training. Indeed, nursing curriculums can encompass courses that address issues related to EBP.

The researchers acknowledge the limitations of this study in using the purposive sampling method, which may lead to biases and prevent the study results from being generalized. However, this can be addressed by using probability sampling, such as simple random sampling to represent the whole population. Moreover, the use of a self-reported tool in our study could have resulted in a high rating by the participants and thus be biased. It is highly recommended that other methodologies are employed to validate the participants' perceptions.

6. Conclusion

Nurses' positive attitude, good knowledge, good application, and outstanding EBP scores are an indication that they are willing to improve their practices in the delivery of safe and quality care. Further, nurses' civil status, nationality, highest degree, job title, and years of experience were causal factors to EBP but with weak influence. Moreover, considering that communication was the most perceived barrier to EBP, it can impact the effective implementation of EBP greatly. Nurses in the hospital practice should continuously undergo training to be able to use EBP effectively. A training program focusing on the married nurses and staff nurses as well as strengthening the communication characteristics to promote the EBP is recommended. For instance, some training programs or strategies such as mentor-mentee programs, communications to colleagues, and interactive education can help in the EBP application. The effectiveness of the training program can be assessed in the future study using different research designs.

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Author contribution

MA, RHA, and GA were responsible for the study conceptualization and study design, while MA, HA, and SA were responsible for the acquisition of data. RDD and MA analyzed and interpreted the data. All of the authors drafted the manuscript and critically revised it. Further, all authors give final approval of the version submitted in this journal.

Conflict of interest

The authors declare no conflicts of interest.

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ORIGINAL RESEARCH

Effect of a Ten-Week Short Message Service-Based Intervention on Self-Management of Type-2 Diabetes Patients in Bali, Indonesia

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Abstract

Background: Diabetes mellitus is a chronic disease that may pose serious complications if poorly managed. The application of mobile technology (m-health) ranging from simple to more complex programs in diabetes management has the potential to foster patients' active involvement in their care. However, the evidence of m-health effectiveness on the self-management of type-2 diabetes patients in low- and middle-income countries is still mixed.
Purpose: This study aimed to evaluate the effect of a ten-week short message system (SMS)-based intervention (Tweek SMSDM) on self-management of type-2 diabetes patients.
Methods: A quasi-experimental study was performed in two groups. The intervention group (n=30) received additional daily automated messages to enhance their diabetic self-care practice, while the control group (n=30) continued to follow the standard program only. Pre- and post-intervention data were measured in both groups using the Indonesian version of the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire. T-test, Mann-Whitney, Wilcoxon Signed-Ranks, McNemar and Fisher exact tests were carried out to analyze the data.
Results: After ten weeks, the intervention group showed significant mean changes in the domains of general diet (0.42±1.08; p=0.034), specific diet (1.75±1.42; p=0.0001), exercise (1.02±1.85; p=0.005), blood-glucose testing (0.53±1.67; p=0.009), and foot care (4.75±2.51; p=0.001) before and after the intervention, while the control group did not. This study also found significant differences in the mean scores for each domain of the SDSCA between the intervention and the control groups (p<0.05).
Conclusion: The Tweek SMSDM program can improve the self-management of type-2 diabetes patients and positively affect each domain in the SDSCA. The findings of this study recommend that nurses integrate the program into patient treatment regimes in primary healthcare centers; therefore, patients and their significant others can play more proactive roles in their diabetic care.

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1. Introduction

Diabetes mellitus is one of the four major non-communicable diseases (NCDs) that contributes to high mortality and morbidity rates worldwide (WHO, 2018). In 2017, diabetes mellitus was responsible for 4 million deaths globally, with 46.1% of these cases were found among people under the age of 60 (International Diabetes Federation, 2017). Data indicate that from 1980 to 2014, the number of adults living with diabetes increased fourfold from 108 million to 422 million, and it is estimated that the number will reach 629 million by 2045 (WHO, 2016). These statistics, however, may not reflect the actual figures since one in two persons with diabetes in 2017 (212.4 million) was undiagnosed (International Diabetes Federation, 2017).

The escalating prevalence of diabetes is higher in lower-income to middle-income countries, such as Indonesia, compared to high-income countries. Of 73% of deaths attributable to NCDs during 2016 in Indonesia, 6% was caused by diabetes (WHO, 2018). Apart from the Indonesian government's efforts to overcome the problem, it is predicted that Indonesia will have more people living with diabetes by 2045, reaching 16.7 million in number with predominantly type-2 diabetes mellitus (International Diabetes Federation, 2017). These trends might indicate the existence of patient-related, healthcare system, financial, and logistical barriers to comply with

currently available national guidelines for managing the disease (Horigan et al., 2017; Venkataraman et al., 2009). Therefore, there is an urgent need to develop a more efficient diabetes care strategy that is more cost-effective, easily accessible, and contextually appropriate to improve the outcomes.

Owing to the chronic nature of diabetes, the disease may pose serious complications if poorly managed. Patients' active involvement in their diabetes care has a pivotal role in the prognosis of the disease (Andriyanto et al., 2019; Holtz & Lauckner, 2012; Mulvaney et al., 2012). Patients' contribution can only be achieved if patients are fully informed; therefore, delivering a diabetes education program to promote self-care in managing their disease termed self-management is crucial (Funnell et al., 2010). Self-management plays a critical role in complementing a pharmacological approach to prevent further complications and increase the patients' overall health outcomes (Hailu et al., 2019) by fostering their self-efficacy, self-perception, and effective diabetes-related coping strategies (Sayeed et al., 2020). Self-management interventions targeting people with diabetes will eventually assist them so they can actively engage in managing the disease symptoms, treatments, lifestyle adjustments, and non-physiological consequences of the disease, and be fully competent in making informed decisions (Hailu et al., 2019; Powers et al., 2017).

One of the most commonly cited diabetes care interventions to support patients' self-management is the application of information technology through the mobile health (m-Health) system (Gatwood et al., 2016). These interventions make use of the mobile communication devices owned by the targets to deliver information relevant to disease management (Arora et al., 2012). To be successfully implemented, m-Health must be technologically appropriate in that it must employ a basic technology that is familiar to the target population, easily accessible, and understandable (Peimani et al., 2016). Previous studies concluded that in lower-income to middle-income countries, particularly those with limited access to advance technology and the internet, broadcasting Short Message Service (SMS) messages is considered to be the most feasible and effective strategy to educate and empower patients to take care of themselves, improve adherence to treatment/medication, and foster their self-efficacy (Abaza & Marschollek, 2017; Van Olmen et al., 2017). The SMS-based intervention is simpler and also safer in protecting the users' privacy than any others m-health application because it is delivered to an individual's target private message inbox and can be easily received or deleted (Rathbone & Prescott, 2017).

In Indonesia, based on the data retrieved from the Ministry of Communications and Information Technology, the number of mobile phone subscribers up to 2017 reached 435.19 million (The Central Bureau of Statistics of Indonesia, 2018). This figure may indicate that Indonesians are already familiar with mobile phone technology and that mobile phone use has infiltrated diverse elements of society regardless of social status. Thus, mobile phone technology has a great potential to be used to disseminate health information among this population. Nevertheless, little is known regarding the role of m-health application in supporting self-management practice in type-2 diabetes patients in Indonesia. Interviews with the primary healthcare nurses (PHNs) working in several primary healthcare centers (PHCs) in Bali during the preliminary study yielded meaningful information that provided a strong background to conduct the current study. The PHNs expressed time constraints to educate the diabetic patients in enough detail as their biggest concern when caring for those patients. The PHNs also found that many patients did not fully understand their condition and how to manage it, which eventually resulted in failure to maintain their health status.

This study was conducted to fill the gap by evaluating the effect of a technologically and contextually appropriate intervention, called Tweek SMSDM for short, in which automated SMS messages were sent using an open-access software to individual patients living in an urban area in Bali for ten weeks' duration. This technology was selected based on the pre-assessment undertaken with the targeted population and the PHNs. Two months before commencing the program, the PHNs were requested to inform the patients during their monthly visit to the PHC regarding the program and asked them to choose the most preferred m-health technology to be implemented. Of the total 30 patients, 28 (93.33%) persons opted for SMS due to its familiarity, comfortability, and accessibility. A discussion with the PHNs further justified this option because the type-2 diabetic patients in the present study were dominated by those aged around 60 years old, where most of them were known to use the cell phone instead of a smartphone. Therefore,

the purpose of the current study was to evaluate the effect of a ten-week short message service-based intervention (Tweek SMSDM) on the self-management of type-2 diabetes patients.

2. Methods

2.1 Research design

This study was a quasi-experimental study performed in two groups: an intervention group following the Tweek SMSDM program and a control group following the standard diabetes management program (i.e., a monthly visit to the patients' respective PHCs).

2.2 Setting and samples

Participants were recruited from 11 PHCs across an urban area in Bali, Indonesia. User-friendly information sheets informing the nature of the study were distributed to the targeted PHCs. In each PHC, a research assistant, who was a registered nurse working in the PHC, was tasked to recommend type-2 diabetes patients to participate in this study. Patients with the following inclusion criteria were eligible to be included in this study: being an adult, having type-2 diabetes, having a personal mobile phone, and being familiar with the texting function. Patients were excluded when they were unable to provide informed consent and had a history of psychiatric illness. From 75 patients recruited by the research assistants, 69 stated their willingness to participate in this study, but only 60 met the final eligibility criteria. Eligible patients were given informed consent forms and were blindly randomized using a random number generator into either the intervention group (30 patients) or the control group (30 patients).

2.3 Intervention

The Tweek-SMSDM intervention is a contextually appropriate, low-cost, and unidirectional program using basic mobile phone functions. Using a free open access SMS management software, an automated SMS message was sent three times daily (at 8 a.m., 11.30 a.m., and 6 p.m.) to each participant in the intervention group for ten weeks' duration. Each SMS consisted of a maximum of 160 characters. An example of the message: "Simple actions to stay healthy: eat healthily, physically active, check blood sugar & take meds regularly, avoid smoking & balance your life. You can do it!". Weekly trivia quizzes were given to the participants in the intervention group. The control group neither received the SMSs nor the quizzes. The PHNs were fully informed about the program and they provided constructive feedbacks along the process of intervention. By doing so, ensuring that our participating patients received information only through our program to reduce the chance of contamination could be maintained, as well as providing educational content that suited well with their needs.

The intervention consisted of continued education, reminders and reinforcement of diet, exercise counseling, foot care counseling, blood-glucose monitoring, medication-taking reminders, and additional information related to healthy habits for diabetes patients (see Table 1). Medication reminders were also incorporated into the messages. The SMS contents were designed mainly based on the diabetes management consensus of the Indonesian Endocrinology Association (Rudijanto et al., 2011) and the SDSCA's components (Toobert et al., 2000) to motivate, educate, remind, and empower patients to manage their disease. The text messages were designed to have direct and indirect influences on patients' self-management practices. The direct influence would come from the messages containing reminders and the indirect influence from the messages that increase social support, foster self-efficacy, and modify beliefs on health. Frequent messages sent daily from an automated SMS will modify patients' health beliefs and simultaneously increase the perceived social support. Self-efficacy will be improved through feedback on patients' self-management practices. Self-efficacy will also mediate the impact of social support on self-management. Eventually, self-management will, in turn, modify health beliefs by decreasing perceived barriers and boost patients' self-efficacy through their experience in managing the disease (Nundy et al., 2013).

2.4 Measurement and data collection

The data collection was conducted from January to March 2020. A week before commencing the intervention, both groups were measured at the baseline using a paper-based questionnaire during their visit to their respective PHC. The data was collected with the help of the PHNs in

every targeted PHC. It was conducted to gather information on their sociodemographic characteristics and general information that included age, gender, marital status, level of education, employment, medication intake, years of having diabetes, years of owning a cell phone and comfort levels of using its texting and calling functions. The questionnaire also consisted of an assessment of patients' self-management practices using the revised version of The Summary of Diabetes Self-Care Activities Measure (SDSCA). The revised version of the SDSCA is an eleven-item brief and a valid self-report instrument to identify the level of self-management in five regime domains, namely diet (item 1 to 4), exercise (item 5 to 6), blood-glucose testing (item 7 to 8), foot care (item 9 to 10), and smoking (item 11). The SDSCA questionnaire asks the respondents to state their self-care activities during the past 7 days. The response options for items 1 to 10 are rated on an eight-point Likert scale from zero ("don't do it at all") to seven ("complete it all"). The first four subscales are scored by calculating the mean number of days per week from the relevant items with higher scores corresponding better self-management practice. The eleventh item is a binary question that indicates an individual's smoking status (0 for "no" and 1 for "yes") and the average number of cigarettes smoked per day (Toobert et al., 2000). Access and permission to use the instrument were granted by the developers. The Indonesian version of the SDSCA has shown satisfying psychometric properties with the Cronbach's alpha of 0.72 and content validity of 0.98 (Sh et al., 2019). After the completion of the program, endpoint measurement was performed at the week eleventh on the intervention and control groups.

Table 1. Contents of the ten-week short message service-based intervention

Items	Topics	Subtopics	Time
Part 1	General information about diabetes	1. Definition 2. Risk factors 3. Signs and symptoms 4. Management and treatment 5. Prognosis 6. Complication 7. Utilization of healthcare facilities 8. The importance of self-management	Covered on week 1 and repeated on week 6 to 10
Part 2	Healthy diet	1. Balanced diet 2. Healthy foods 3. Substitution foods 4. Food composition 5. Calories need 6. Food preparation 7. Healthy cooking methods 8. Eating schedules	Covered on week 2 and repeated on week 6 to 10
Part 3	"Get moving" physical activities	1. Types of physical activity 2. Preparations 3. Targets 4. Duration and frequency 5. Contraindications 6. Tips for overcoming barriers 7. Foot care	Covered on week 3 and repeated on week 6 to 10
Part 4	"Self-check" blood glucose monitoring	1. The importance 2. Timing 3. Practice guidance 4. Interpret the results	Covered on week 4 and repeated on week 6 to 10
Part 5	Additional information	1. Avoid smoking 2. Weight control 3. Stress management	Covered on week 5 and repeated on week 6 to 10

2.5 Data analysis

Descriptive statistics were carried out to identify the data gathered at the baseline. Independent t-test and chi-square test were used to test the homogeneity of the characteristics between the intervention and control groups. Baseline differences in the SDSCA subscales between the two groups were also analyzed using the independent t-test, except the blood-glucose

testing, which was analyzed using the non-parametric Mann-Whitney test as the data were not normally distributed. Post-intervention data were analyzed using a paired t-test for the data that were normally distributed and a Wilcoxon Signed-Ranks test for the data that were not normally distributed. For all statistical assessments, a two-sided p-value less than 0.05 was considered statistically significant.

2.6 Ethical considerations

Ethical approval to conduct the study was received from the Research Ethics Committee of Udayana University and Sanglah Hospital (1839/UN.14.2/Litbang/2020). All participants provided informed consent, and their anonymity was preserved. Access to the target population and permission to perform the study in Bali, Indonesia, was granted by the local authorities.

3. Results

3.1 Characteristics of particpants

This study included 60 subjects at the baseline and a ten-week follow-up. Table 2 shows that the intervention and control groups were homogenous (p>0.05). The mean age of the intervention group was 61.03 years, while that of the control group was 61.20 years. Male and female subjects were distributed evenly between the two groups so that each group consisted of 50% male subjects and 50% female subjects. The majority of the subjects in both groups were married (intervention 86.7%, control 90%), graduated from primary education (intervention 46.7%, control 50%), were unemployed (intervention 46.7%, control 43.3%), and were on oral hypoglycemic agent medication (intervention 83.3%, control 80%). The duration of diabetes varied largely in both groups. All participants indicated being comfortable using basic texting features (receiving and creating messages).

Table 2. Demographic characteristics of respondents (n=60)

Characteristics	Intervention Mean(SD)	Control Mean(SD)	Intervention f(%)	Control f(%)	*p*
Age (year)	61.03 (8.58)	61.20 (7.10)			0.935*
Gender,					1.000[ł]
Male			15 (50)	15 (50)	
Female			15 (50)	15 (50)	
Marital status					1.000[æ]
Married			26 (86.7)	27 (90)	
Separated/divorced/widowed			4 (13.3)	3 (10)	
Education					0.839[€]
Primary school graduate			14 (46.7)	15 (50)	
Senior high school graduate			9 (30)	7 (23.3)	
College graduate or higher			7 (23.3)	8 (26.7)	
Employment					0.938[€]
Employed			11 (36.7)	11 (36.7)	
Unemployed			14 (46.7)	13 (43.3)	
Retired			5 (16.6)	6 (20)	
Medication					1.000[ł]
Oral hypoglycemia agents			25 (83.3)	24 (80)	
Insulin			5 (16.7)	6 (20)	
Years of Diabetes Mellitus					0.852[€]
≤ 5 years			13 (43.3)	12 (40)	
6-10 years			9 (30)	8 (26.7)	
>10 years			8 (26.7)	10 (33.3)	
Comfort level making/ receiving textings					-
Very or somewhat comfortable			30 (100)	30 (100)	
Comfort level making/ receiving calls					1.000[æ]
Very or somewhat comfortable			25 (83.3)	26 (86.7)	
Not comfortable			5 (16.7)	4 (13.3)	
Years of owning a cell phone					0.852[€]
≤ 5 years			10 (33.3)	8 (26.7)	
6-10 years			12 (40)	13 (43.3)	
>10 years			8 (26.7)	9 (30)	

Notes. *Independent t-test, [ł]Continuity Correction, [æ]Fisher's Exact test, [€]Pearson Chi-Square

3.2 Comparison of self-management assessed by the Summary of Diabetes Self-Care Activities Measure

Table 3 shows mean score changes in each domain of the SDSCA in intervention and control groups before and after the Tweek SMSDM program. There were significant differences in the mean scores for each of the domains of the SDSCA between the intervention and the control groups (p<0.05), except for smoking status. Changes in mean scores also indicate that, on average, the patients in the intervention group have increased their ability to perform activities listed on the SDSCA instrument for 1-5 days in any given week. The mean score changes in each domain can be outlined as follow: 0.42 (SD=1.08) for general diet, 1.75 (SD=1.42) for specific diet, 1.02 (SD=1.85) form exercise, 0.53 (SD=1.67) for blood-glucose testing, and 4.75 (SD=2.51) for foot care.

Table 3. Differences in the mean score changes of the diabetes self-management practice between groups (n=60)

Domains	Intervention Mean(SD)	Control Mean(SD)	Intervention f(%)	Control f(%)	*p*
SDSCA					
General diet	0.42 (1.08)	-0.13 (0.54)			0.016*
Specific diet	1.75 (1.42)	-0.02 (0.38)			0.0001*
Exercise	1.02 (1.85)	0.07 (0.29)			0.007*
Blood-glucose testing	0.53 (1.67)	-0.03 (0.49)			0.0001£
Foot care	4.75 (2.51)	0.20 (0.64)			0.0001*
Smoking status post intervention					1.000α
Yes			0 (0.0)	1 (3.3)	
No			30 (100)	29 (96.7)	

*Independent t-test, £Mann-Whitney test, αFisher's Exact test

Table 4 shows within-group post-intervention differences from the baseline in the self-management practices between the groups being compared. After ten weeks, improvements in all domains of the SDSCA were apparent in the intervention group. Statistical improvement was observed in the domains of general diet (0.42±1.08; p=0.034), specific diet (1.75±1.42; p=0.0001), exercise (1.02±1.85; p=0.005), blood-glucose testing (0.53±1.67; p=0.009), and foot care (4.75±2.51; p=0.001), while there were no significant mean changes in the control group (p>0.05). In the smoking status domain, no significant difference in proportion was found before and after intervention (p=1.00).

Table 4. Differences in the diabetes self-management practice within each group pre-post intervention (n=30)

Domains	Intervention (n=30)		*p*	Control (n=30)		*p*
	Pre	Post		Pre	Post	
SDSC, mean (SD)						
General diet	6.32 (0.83)	6.73 (0.92)	0.034ł	6.23 (0.93)	6.10 (1.04)	0.197ł
Specific diet	4.93 (1.42)	6.68 (0.46)	0.0001*	4.93 (1.33)	4.92 (1.30)	0.813*
Exercise	5.55 (1.57)	6.57 (0.94)	0.005*	5.58 (1.49)	5.65 (1.36)	0.211*
Blood-glucose testing	0.72 (1.39)	1.25 (1.10)	0.009ł	0.93 (1.34)	0.90 (1.47)	0.705ł
Foot care	2.08 (2.43)	6.83 (0.65)	0.0001*	2.12 (2.44)	2.32 (2.24)	0.097*
Smoking status, f(%)	1 (3.3)	0 (0)	-	1 (3.3)	1 (3.3)	1.00¥

*Paired t-test, łWilcoxon Signed Ranks test, ¥McNemar's test

4. Discussion

There has been a dearth of literature examining the effectiveness of the m-Health technology application on self-management practices among patients with type-2 diabetes from the Indonesians' perspective. The present study attempted to bridge this gap by evaluating the impact of a ten-week automated text-message-based diabetes self-management program on patients' self-care practices in managing their disease, measured using the revised version of the SDSCA instrument. Patients' ability to perform self-management will eventually improve their health outcomes by preventing complications or slowing the disease progression (Holtz & Lauckner, 2012; Mulvaney et al., 2012; Pamungkas et al., 2015).

In the present study, positive trends towards the improvement of self-management practices were evident within the intervention group. This study is consistent with the previous studies conducted in other countries, which found that using contextually appropriate technology by broadcasting text messages to people living with diabetes in lower-income to middle-income countries was effective to improve their self-management level (Abaza & Marschollek, 2017; Arora et al., 2012; Van Olmen et al., 2017). The effectiveness of the program in the current study might also be influenced by the broad array of information covered in the text messages. Researchers designed the contents of the Tweek SMSDM program based on the evidence-based practice guidelines that had been implemented in the local healthcare centers (Rudijanto et al., 2011). Furthermore, the intensive text messages that were sent three times daily for ten weeks' duration might alter patients' health beliefs and provided an easily accessible support system as perceived by the type-2 diabetes patients (Nundy et al., 2013). In each text message, encouraging sentences were applied to provide positive reinforcement for the patients. The purpose was to increase patients' self-efficacy, which is known to be an antecedent to patients' self-management (Nundy et al., 2013; Richard & Shea, 2011). Self-efficacy will also mediate the impact of social support on self-management (Nundy et al., 2013).

In this study, SDSCA scores across all domains in the intervention group showed a trend of improvement after the Tweek SMSDM program, with the highest improvement in the foot care domain. Contrastingly, the general diet domain showed the lowest mean score improvement. However, it should be taken into consideration that the scores for general diet among the participants in the intervention group were already high at the baseline measurement. A study by Nundy et al. (2013) also showed a positive impact of text message-based interventions on diabetes patients' foot care practice under a six-month m-Health project. The improvement in the foot care domain's score might be due to the foot care procedure being generally simple. Foot care could be carried out without any complex lifestyle or environmental modifications and implemented routinely without consuming much time. In this study, the patients were also reminded of the importance of foot monitoring and choosing comfortable and supportive footwear.

The findings in the diet domains could be explained by the impact of people's social and cultural backgrounds on their diet patterns. Cultural backgrounds and religious beliefs influence people's food preferences (Shipman & Durmus, 2017). In this study, the findings in the diet domains might also be explained by the present study's population demographic characteristics. The average age of the participants in this study was 60 years, and most of them were already retired, so their dietary habits could have been greatly influenced by the habits in their families. In this case, families could provide a support system for diabetes patients that contributed to their adherence to the recommended diet plan and physical activity (Pesantes et al., 2018; Rahmah et al., 2019). This study also found that the patients in the intervention group were showing a significant change in the specific diet domain score. This result could be associated with the Balinese cultural background, where there are various local events and activities that use fruits as the primary food items for material offerings (Adiputra, 2017; Sujarwo et al., 2020).

Another important finding in this study was not only that all respondents in both groups expressed being comfortable with using basic texting features such as receiving and creating messages, but also the fact that no respondent dropped out of the study. This indicates the feasibility of implementing an SMS-based intervention among patients with type-2 diabetes in Indonesia, particularly in Bali. A systematic review by Peiris et al. (2014) concluded that m-Health was promising for health care support such as behavioral management in non-communicable disease patients in lower-income and middle-income countries. The present study sent the SMS-based interventions in conjunction with maintaining the standard/conventional diabetes management recommended by the respective PHC. This might also explain why all the respondents stayed until the end of the program. Also, it is important to note that the majority of the respondents in both groups were unemployed or already retired, so they were enthusiastic about completing the ten-week intervention program and integrating the application of text-message technology with which they were already familiar into their disease management.

5. Implication and limitation

The findings of this study have crucial implications, not only for diabetes patients but also for their significant others and health care providers, particularly nurses, on how to better support people living with diabetes to maintain their health status. Healthcare providers working with

diabetes patients in PHCs or any settings could adopt the application of this simple yet effective technology in their daily practice to overcome barriers that they may encounter. Support from relevant stakeholders is also necessary to integrate the application of this kind of technology into the healthcare system. More importantly, patients and their significant others should proactively engage to manage the disease by seeking and adhering to reliable health information given by trusted parties, so that positive outcomes of disease management can be achieved.

The primary limitation of this study could be the absence of intermediate assessments before the endpoint evaluation on the tenth week, which might have had significant practical and financial implications. Also, a unidirectional text-message system was implemented, which made it impossible to provide information tailored to specific patients' needs. In this study, we also fully relied on patients' self-reported information; therefore we could not completely ensure that they performed the recommended regimes appropriately. These warrant directions for future studies. However, the present study has yielded evidence gathered from the field regarding the effect of a contextually appropriate m-health application to address the current practice need on improving diabetics patients' involvement to manage the disease in Indonesia, particularly in Bali.

6. Conclusion

Patients' active involvement is a cornerstone for successful diabetes mellitus management. Therefore, it is necessary to foster patients' awareness, knowledge, and capacity on diabetes self-care practice by employing a simple, cost-effective, easily accessible, and contextually appropriate intervention. The present study indicates that using a basic function of the mobile phone technology can improve diabetes patients' self-management practice in the areas of general information about the disease, healthy diet, recommended physical activity and foot care practice, blood-glucose monitoring, and so on. The findings of this study recommend for nurses to better support people living with diabetes, particularly in community settings, by integrating the program into patient treatment regimes in primary healthcare centers. Therefore, patients and their significant others can play more proactive roles in managing their disease to prevent further complications and improve their health outcomes. Further studies of integrating mobile technology applications into diabetes care are also recommended by taking the limitations of the current study into account. First, it is necessary to conduct a series of program evaluations, including the long-term assessment that is not only focusing on the program's effectiveness but also on how the targets perceive it. Second, it might consider implementing tailored and bidirectional message services to address specific patients' needs. Finally, it should consider integrating strategies to monitor targets' compliance more objectively, such as behaviors observation or the measurement of diabetes makers.

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Author contribution

All authors contributed to the study conception and design (MRD and GAAA), data collection (MRD and NLPN), data analysis (MRD and GAAA), manuscript writing and revision for important intellectual content (MRD, GAAA and NLPN). All authors read and approved the final manuscript.

Conflict of interest

The authors declare no conflict of interest

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REVIEW

Effects and Interventions of Pressure Injury Prevention Bundles of Care in Critically Ill Patients: A Systematic Review

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Abstract

Background: Many studies on pressure injury prevention bundles have been conducted outside the Intensive Care Unit (ICU). The bundles, which include multi interventions, have proven effective in reducing pressure ulcer incidents compared to a single intervention. However, the existing review studies on pressure injury prevention in ICUs still only investigate a single intervention rather than multi interventions. Only few reviews, to our knowledge, involves prevention bundle strategies in the ICU.
Purpose: This study aims to review the effects of the pressure injury prevention bundles of care on the incidents of pressure injury in critically ill patients and the intervention measures of the care bundles.
Methods: This review searched published articles from several databases, namely EBSCO, ScienceDirect, PubMed, ProQuest, Google Scholar, and Scopus from 2009 up to 2020. PRISMA flowchart was used to select relevant articles using several inclusion and exclusion criteria, resulting in 17 articles from 50 eligible full-text articles for assessment. The included studies were assessed for their quality using Joanna Briggs Institute (JBI) critical appraisal tools. The synthesis was then conducted narratively.
Results: As many as 17 studies, which mostly had good quality yet evidence level of II, were included in the analysis. The findings showed that the pressure injury prevention bundles of care decreased pressure injury incidents as many as 4.3%-36.2% in developed countries and 4.16%-25.72% in developing countries. Moreover, the bundles of care which significantly reduced the incidents of pressure injury consisted of 7 intervention measures, which were pressure injury risk assessment using Cubbin Jackson scale, skin assessment and care, repositioning, nutrition, education, support surface, and medical device care.
Conclusion: The review concluded that the pressure injury prevention bundles of care in critically ill patients significantly reduced the incidents of pressure injury. The study recommends more studies with stronger evidence levels to carry out and utilize 7 intervention measures as a preventive standard of care in critically ill patients.

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1. Introduction

Pressure injuries still become a health problem related to patient safety in various parts of the world, regardless of the current progress in the quality of health care. The incidence of pressure injuries in the hospital is one of the unexpected events during hospitalization in the context of patient safety (Slawomirski et al., 2020). The incidence of pressure injuries in the Intensive Care Unit (ICU) in some countries is reported to be around 8.1%-63% (Clough et al., 2016; Dale et al., 2018). At the same time, the incidence of pressure injuries in some developing countries is about 4.16%-39.3% (Akhkand et al., 2020; Anderson et al., 2015; Girard et al., 2014; Lupe et al., 2015; Mallah et al., 2015;

Manzano et al., 2014; Ozyurek & Yavuz, 2015; Rogenski et al., 2015; Siracusa & Schrier, 2011; Tayyib & Coyer, 2016; Uzun et al., 2015). A pressure injury can occur in various anatomic locations due to intense or prolonged pressure or injury with a combination of shear and friction (Edsberg et al., 2016). The situation may worsen in the ICU resulting in some negative impacts.

Research shows that pressure injuries have adverse effects on patients, including physical, social, psychosocial, and financial aspects that will interfere with the quality of life (Brooke et al., 2019; Liu et al., 2019). Pain, sleep disturbances, and malaise are symptoms in physical aspects (McGinnis et al., 2014; Rutherford et al., 2018), while stress, depression, and social isolation are symptoms in psychosocial and social aspects (Artico et al., 2018; Repić & Ivanović, 2014), that patients with a pressure injury often complain. In terms of financial aspect, Demarré et al. (2015) reported that there was an increase in costs on the national budget for the treatment of pressure injury in some developed countries around 121.44 million - 2.59 billion euros annually, while estimated costs for each individual range from 15-69.472 euros. These adverse effects would have been more dangerous for critically ill patients.

Critically ill patients have the risk factors for developing pressure injury. These factors include immobilization, ventilators, sedation, unstable hemodynamics, poor perfusion, cardiac medication administration, vasopressors, and vasodilators (Alderden et al., 2017; Vollman, 2013). Pressure ulcers may be caused by the inadequate blood supply and resulting reperfusion injury when blood re-enters tissue. A simple example of a mild pressure sore may occur in healthy individuals, while immobilization in the same position for extended periods of time, the dull ache experienced is indicative of impeded blood flow to affected areas. Within 2 hours, this shortage of blood supply, called ischemia, may lead to tissue damage and cell death (Bhattacharya & Mishra, 2015). Pressure injuries have a detrimental effect on patients; however, they have the potential to be prevented (Padula et al., 2015).

Current international guidelines suggest the use of multiple interventions in the prevention of pressure injuries in critically ill patients (Haesler et al., 2017). Unfortunately, a single intervention is still used even though there is already published evidence of multi-interventions related to the effective prevention to reduce the incidence of pressure injuries (Donovan et al., 2016). Multi interventions have been proven effective in reducing pressure injury incidents compared to a standard or single intervention (Amr et al., 2017; Citra et al., 2010; Mallah et al., 2015; Riemenschneider, 2018; Saragih, 2018; Setyawati et al., 2015; Tam et al., 2019; Wayunah, 2018). However, these studies were conducted outside the ICU.

Many studies reported the use of a single intervention to prevent pressure injuries for critically ill patients (Behrendt et al., 2014; Cox & Rasmussen, 2014; Gill, 2015; J. Y. Kim & Lee, 2018; Krupp & Monfre, 2015; Langer & Fink, 2014; Manzano et al., 2014; Saghaleini et al., 2018; Wood et al., 2019), although there are now recent studies using multi-interventions in the ICU (Amr et al., 2017; Anderson et al., 2015; Richardson et al., 2017; Tayyib et al., 2015). As a result, many review studies had been done on a single intervention (Brooke et al., 2019; Gillespie et al., 2012; Lewis et al., 2016; Shi et al., 2018) to prevent pressure injuries in the ICU rather than multi-faceted interventions. Only a few review studies, to our knowledge, involves prevention bundle strategies in the ICU (Al-Dorzi, 2019; Emma & Rita, 2018; Lin et al., 2020; Zuo & Meng, 2015). However, three studies are literature reviews (Al-Dorzi, 2019; Emma & Rita, 2018; Zuo & Meng, 2015), and one study only focuses on the quality improvement program of pressure injuries and its strategies (Lin et al., 2020; Novelia et al., 2017). Therefore, a more comprehensive review on the prevention measures and specific reduction effects on the pressure injury incidents is required. This review aims to describe the effects of the prevention bundles of care on the incidence of pressure injuries. This review also analyzes multiple interventions used in the pressure injury prevention bundles of care in critically ill patients.

2. Methods

2.1 Research design

This study was a systematic review using the Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) (Page et al., 2021) and employed PICO (population, intervention, comparison, and outcome) approach to search the literature.

2.2 Search methods

This review conducted a comprehensive search of literature through several databases such as EBSCO, ScienceDirect, PubMed, ProQuest, Google Scholar, and Scopus from 2009 to 2020 using several pre-determined keywords in English and in the Indonesian language. "Adult", "intensive care", and "critical care' were used as keywords for the population. "Prevention", "pressure ulcers/injury/sores", "skin injuries", "intervention bundle", "bundle of care", and "multi/multiple interventions" were used as keywords for the intervention and comparison. "Reduction" and "incident" were also used as keywords for the outcome. Boolean phrases were used during the searching process using the combination of keywords. Relevant articles from the reference lists of the included literature were also retrieved in order to get more thorough searching results. This searching process was done by one author (WT).

2.3 Inclusion and exclusion criteria

The articles obtained from the searching process were then screened for their eligibility using some inclusion and exclusion criteria. The inclusion criteria were randomized controlled trial and experimental research studies, conducted in the critical care unit, examining pressure injury incidents and interventions, involving adult participants of 18-69 years old, participants without underlying diseases and pressure injuries before ICU's commencements, treated in the critical units more than 24 hours, and utilizing more than one intervention of pressure injury preventions. The review excluded papers that were written in non-English and non-Indonesian languages and of their results which were difficult to be separated from other populations or interventions.

2.4 Screening of articles

The Mendeley citation manager was used to pool and screen the search results. Two authors (WT and NR) independently screened the articles according to titles and abstracts, and also languages after duplicate removal. Full-text articles were then screened for their eligibility based on the inclusion and exclusion criteria. Any discrepancies were discussed between the two authors and consulted to the third author (RR).

2.5 Data extraction

Quality assessment from the included studies and extraction of the data were separately done by two authors (WT, NR). Some disagreements were discussed between the two authors and resolved by the third author (RR). Furthermore, data extraction was done using predetermined extraction table consisting of author/year, city/country, aim, design, sample and setting, intervention measures, main result, and outcomes (Table 1) (see Appendix 1).

2.6 Quality appraisal

The quality of studies was critically assessed using the Joanna Briggs Institute (2017) (JBI) critical appraisal tools and their level of evidence (Table 2). Checklists for quasi-experimental and randomized controlled trials were used to appraise the included studies (Munn et al., 2014). There were 9 questions of the quasi-experimental checklist and 13 questions of randomized controlled trials checklist with 4 options for the answer: yes, no, unclear, and not applicable. The answer of yes scored 1, while the answer of no, unclear, and not applicable scored 0. The studies were classified as good if the total score was >80%, fair if the total score was 50-80%, and poor if the total score was <50% (Reilly et al., 2016). Five level classical pyramids of evidence was also used to classify the included studies' level of evidence. Level I and II included randomized controlled trials and cohort studies, respectively, while case-control studies were classified as level III (Greenhalgh et al., 2011; Higgins et al., 2021). There were no level IV and V studies.

2.7 Data analysis

Heterogeneity in the methods and statistical values of the outcomes caused this review could not perform a meta-analysis of the pressure injury incidents. Therefore, a narrative synthesis was conducted. The studies' characteristics, the incidents of pressure injury, and the intervention

measures of pressure injury's prevention bundle were separately summarized to enhance understanding and thorough analysis of the outcomes. The steps of narrative analysis were carried out according to nine syntheses without meta-analysis (SWiM) reporting items of systematic reviews (Campbell et al., 2020).

Table 2. Level of evidence and critical appraisal

No	Author, years	Level Evidence	Critical Appraisal
1	Chaboyer et al., (2016)	I	Good
2	Tayyib et al., (2015)	I	Fair
3	Anderson et al., (2015)	III	Fair
4	Amr et al., (2017)	III	Poor
5	Avşar & Karadağ, (2018)	III	Good
6	Mallah et al., (2015)	II	Good
7	Swafford et al., (2016)	II	Good
8	Rogenski et al., (2015)	II	Good
9	Uzun et al., (2015)	II	Good
10	Gage, (2015)	II	Fair
11	Vasconcelos & Caliri, (2017)	II	Poor
12	Coyer et al., (2017)	II	Fair
13	Siracusa & Schrier, (2011)	III	Fair
14	He et al., (2016)	II	Good
15	Lupe et al., (2015)	II	Poor
16	Loudet et al., (2017)	III	Fair
17	Lewis et al., (2015)	II	Fair

**Notes*. Critical appraisal Score: Good (>80% quality score), moderate (50%-80% quality score, and poor (<50%) (Alshahrani et al., 2021), *I: Systematic review or meta-analysis, prospective cohort, II: RCT, cohort studies, III: Case control, IV: Case series, V: Expert opinion, report or clinical example (Greenhalgh et al., 2011)

3. Results

3.1 Characteristic of the included studies

A PRISMA flowchart was used to select the included studies (Figure 1). In this review, 17 papers were included, consisting of quasi-experimental (n=14), RCT (n=2) and cohort (n=1) studies. Of this number, 9 studies were in developing countries (Anderson et al., 2015; Chaboyer et al., 2016; Coyer et al., 2016; Loudet et al., 2017; Lupe et al., 2015; Rogenski et al., 2015; Siracusa & Schrier, 2011; Swafford et al., 2016; Vasconcelos & Caliri, 2017), while 7 studies were carried out in developed countries (Amr et al., 2017; Avşar & Karadağ, 2018; He et al., 2016; Lewis et al., 2015; Mallah et al., 2015; Tayyib et al., 2015; Uzun et al., 2015). These studies were conducted in Australia, Saudi Arabia, Turkey, Lebanon, United Sates, Egypt, Brazil, United Kingdom, China, and Argentina; and included a total of 7.439 patients. Based on the review, the bundles of pressure injury were performed in various types of ICU such as medical, surgical, trauma, neurology, cardiovascular, and oncology. Twelve studies used a large sample of tertiary referral hospitals, 3 studies used small samples in an ICU, and 2 studies did not include sample sizes. The details for each study are presented in Table 1.

The results of the initial search identified 302,569 titles from online databases; their duplicates were removed. As many as 301,733 titles were excluded after a further screening on the titles and abstracts, and language, leaving 836 full-text. The results of the critical appraisal showed that most of the articles have good quality but with level II evidence. Only 2 articles show a high-quality and high level of evidence (Figure 1).

3.2 Primary outcome measurement: Incidence of pressure injury

The outcome of all these studies was the incidence of pressure injuries. In this review, 14 of 17 studies reported a decreased incidence of pressure injuries (Amr et al., 2017; Anderson et al., 2015; Avşar & Karadağ, 2018; Chaboyer et al., 2016; Coyer et al., 2017; He et al., 2016; Loudet et al., 2017; Lupe et al., 2015; Mallah et al., 2015; Rogenski et al., 2015; Siracusa & Schrier, 2011; Swafford et al., 2016; Tayyib et al., 2015; Uzun et al., 2015). This review showed that the incidence of pressure injuries in patients after the implementation of pressure injury prevention bundle of care in ICU ranged from 4.3% to 36.2% in developed countries and from 4.16% to 25.72% in developing countries (Table 3).

The review also shows that pressure injuries often appear in sacral, ear, trochanter, heel, occiput tuberosity, and sacrum areas.

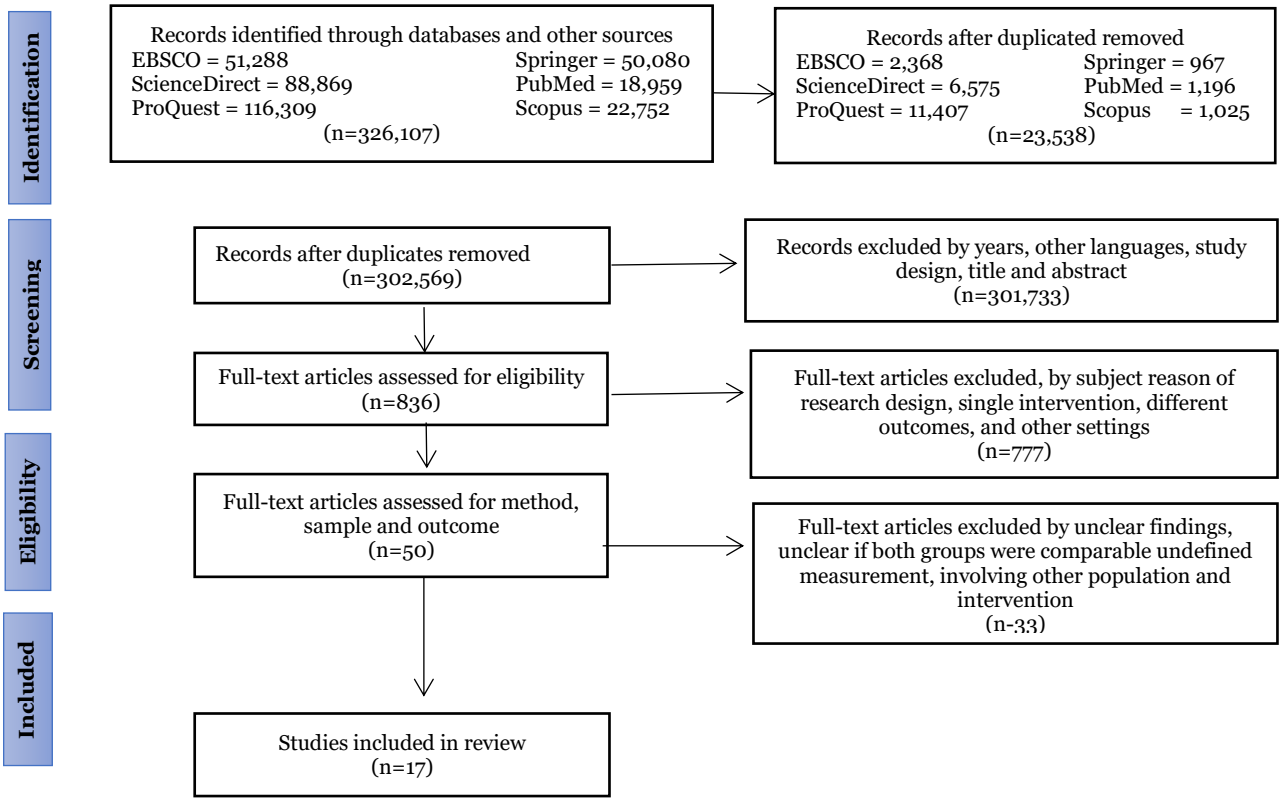

Figure 1. PRISMA Flowchart

The incidence of pressure injuries in patients after the implementation of pressure injury prevention bundle of care is presented in Table 3.

Table 3. Alterations of the incident of pressure injury in ICU

No.	Author, years	City/ Country	Incident		Δ incident
Developed country*					
1	Chaboyer et al., (2016)	Australia	12%	7.7%,	-4.3%
2	Anderson et al., (2015)	Minnesota, USA	15.5%.	2.1%	- 13.4%
3	Avşar & Karadağ, (2018)	Ankara, Turkey	54.5%	18.3%	- 36.2%
4	Swafford et al., (2016)	USA	10%	3%	- 7%
5	Coyer et al., (2017)	Australian	32%	15%	-17%
6	Siracusa & Schrier, (2011)	Pennsylvania, USA	10.9%	0.9%	-10%
7	He et al., (2016)	Hangzhou, China	62.5%	31.4%	-31.1%
8	Lupe et al., (2015)	Miami	11.7%	2.8%	-8.9%
9	Uzun et al., (2015)	*Turkey*	37%	17%	-20%
Developing country*					
1	Tayyib et al., (2015)	Saudi Arabia	32.86%.	7.14%	- 25.72%
2	Amr et al., (2017)	Saudi Arabia	4.6%	0.3%	- 4.4%
3	Mallah et al., (2015)	Lebanon	6.63 %	2.47%.	- 4.16%
4	Rogenski et al., (2015)	San Paulo, Brazil	41.02%	23.1%.	-17.92%
5	Loudet et al., (2017)	Buenos Aires, Argentina	11.7%	2.8%	-8.9%
			75%	54%	-21%

Notes: *Classification of developed and developing country was based on The World Bank (2021)

3.3 Secondary outcomes: Pressure injury prevention strategies

The interventions used to prevent pressure injuries were analyzed and reported by the type of intervention. This review found that multi-interventions (bundles) that significantly reduced the incidence of pressure injury consist of seven (7) interventions: risk assessment, skin care, reposition, nutrition, support surface, education, and medical device maintenance. It is shown that multi interventions with significant effects on reducing the incidence of pressure injury were risk assessment, skincare, support surface, and repositioning (Table 1).

3.3.1 Pressure injury risk assessment (1st strategy)

Several risk instruments were used in the studies to identify participants who were prone to stress injuries. The study showed that the incidence of pressure injury patients admitted to the ICU were assessed by Waterlow, Cubbin Jackson, Braden. The Braden scale was the most frequently used pressure injury risk assessment instrument in this study (Amr et al., 2017; He et al., 2016; Loudet et al., 2017; Lupe et al., 2015; Mallah et al., 2015; Rogenski et al., 2015; Siracusa & Schrier, 2011; Swafford et al., 2016; Tayyib et al., 2015; Uzun et al., 2015; Vasconcelos & Caliri, 2017). However, Cubbin Jackson scale had more comprehensive risk assessment aspects for critically ill patients.

3.3.2 Skin care (2nd strategy)

Maintaining the integrity of the skin is an important factor in reducing the occurrence of pressure injuries. There were 12 studies (Coyer et al., 2017; Gage, 2015; He et al., 2016; Karadag & Özdemir, 2008; Lewis et al., 2015; Loudet et al., 2017; Lupe et al., 2015; Rogenski et al., 2015; Siracusa & Schrier, 2011; Swafford et al., 2016; Uzun et al., 2015; Vasconcelos & Caliri, 2017) in Table 1 which showed that skin-based creams silicone application, using antiseptic soaps with 2% of hydrogen perioxide and prepacked pH balanced washcloth once per day, and giving basic skin moisturizer (petroleum jelly, VCO, sorbolence) every bath could reduce the incidence of pressure injuries in the patients admitted to critical units.

3.3.3 Reposition (3rd strategy)

Repositioning is an intervention to reduce the duration of pressure on tubal areas that are prone to pressure injuries, such as areas of bony prominence, in addition to providing a sense of security and maintaining the patient's functional ability. Studies related to reposition are presented in Table 1. As many as 15 studies (Amr et al., 2017; Avşar & Karadağ, 2018; Chaboyer et al., 2016; Coyer et al., 2017; He et al., 2016; Lewis et al., 2015; Lupe et al., 2015; Mallah et al., 2015; Manzano et al., 2014; Siracusa & Schrier, 2011; Swafford et al., 2016; Tayyib et al., 2015; Uzun et al., 2015; Vasconcelos & Caliri, 2017) reported the benefits of patients' repositioning. The repositioning used a three- or two- or six-hour play schedule using a "play clock." The legs of the bed were elevated by 20 degrees if clinically permitted. The patient's heel was elevated and supported. Also, draw sheets were used to transfer and lift patients (Gillespie et al., 2012; Zhang, 2021; Zuo & Meng, 2015). Behrendt et al. (2014) reported that a bedside pressure mapping system was able to support clinical staff to optimize repositioning and duration of repositioning, allowing interventions to reduce initial pressures. When two methods were compared for patient repositioning, a clockwise rotation system was effective in reducing the incidence of pressure injury compared to standard pillow care (Whitty et al., 2017).

3.3.4 Nutritional intervention (4th strategy)

Nutrition plays an important role in the prevention and treatment of pressure injuries (He et al., 2016). Macro and micronutrients were needed by each organ system in a certain amount to promote the growth, development, maintenance, and repair of body tissues. Nutrition-related studies were presented in Table 1. Four studies (Amr et al., 2017; Chaboyer et al., 2016; Gage, 2015; Mallah et al., 2015; Siracusa & Schrier, 2011) related to nutrition for the prevention of pressure injuries. In addition, albumin levels as an indicator of malnutrition should be assessed routinely (weekly or biweekly) to determine trends in nutritional therapy adequacy. A recent study reported by Amr et al.,

(2017) pointed out that enteral nutritional formula fortified with fish oil containing polyunsaturated fatty acids, significantly reduced the incidence of stress injuries in critical units.

3.3.5 Support surface (5th strategy)

The support surface is the surface on which a patient is placed to manage pressure, shear, and microclimate loads. This surface includes mattresses, trolleys, operating table mattresses, integrated bed systems, and pillow chairs. The support surface is designed to reduce interface pressure ulcers by increasing the surface area of the body or alternating the area of the body in contact with the support surface. Table 1 shows the results of the support surface of 10 studies (Anderson et al., 2015; Gage, 2015; He et al., 2016; Loudet et al., 2017; Lupe et al., 2015; Mallah et al., 2015; Ozyurek & Yavuz, 2015; Tayyib et al., 2015; Uzun et al., 2015). These studies only evaluated mattresses; no studies related to pillow performance were found. Ozyurek & Yavuz (2015) assessed the effect of two types of viscoelastic mattresses (viscoelastic foam 1 consisting of two layers and viscoelastic foam 2 consisting of three layers) in patient admitted to critical units. They found no statistically significant difference between patients using plain foam and patients using viscoelastic foam to decrease the incidence of pressure injury grade ≥ II when compared with the overlay *of APAM (alternating pressure air mattress)* in patients admitted to critical units.

3.3.6 Educational (6th strategy)

This review showed that staff education was an important component of pressure injury prevention. The educational programs should include a variety of factors that reflect the multifactorial nature of pressure injury. There were 6 studies (Chaboyer et al., 2016; Gage, 2015; Lupe et al., 2015; Swafford et al., 2016; Tayyib et al., 2015; Vasconcelos & Caliri, 2017) in Table 1 which showed the results of education and education of health workers. The education with a focus on preventive care can be effective in reducing the incidence of pressure injury in critical care settings.

3.3.7 Medical device maintenance (7th strategy)

Treatment using medical devices is proven to reduce pressure injuries by using several dressings on the skin area where the medical device is attached. Based on Table 1, there were two studies (Tayyib et al., 2015; Zakaria et al., 2018) reporting that dressing on medical devices was effective in preventing pressure injuries. There was one type of dressing that showed a statistically significant reduction in the incidence of pressure injuries, such as polyurethane film dressings rather than hydrocolloid dressings (Boyko et al., 2018). Lewis et al. (2015) and Tayyib et al. (2021) found that coated thin hydrocolloid and silicone single-layer dressings were effective in reducing pressure injuries on the medical device fixated areas (non-invasive ventilator, endotracheal tubes/ tracheal tubes, nasogastric tubes, urinary catheter, non-rebreathing/oxygenation mask) in critically ill patients when previously applied within 24 hours of admission to the critical care room.

4 Discussion

This review aimed to identify the impact of the pressure injury prevention bundles of care on the pressure injury incidents in critically ill patients and to identify the intervention measures of the care bundles. The result of this review showed that the bundles of care reduced the incidents of pressure injury in critically ill patients both in developed and developing countries although the reduction was higher in the former countries. Furthermore, risk assessment, skin care, reposition, nutrition, support surface, education, and medical device maintenance were identified as effective strategies for preventing pressure injuries in critically ill patients.

4. 1 The incidence of pressure injury

The use of multiple interventions reduces the incidence of pressure injury in critically ill patients by 4.3% to 36.2% in 9 developed countries, and 4.16%-25.72% in 5 developing countries (The World Bank, 2021). The success of the bundles in reducing the incidence of pressure injury is affected by nurses and is dependent on standard operating procedures, nurses' knowledge, compliance with nursing actions supported with clear documentation, and complete data interpretation (Lavallée et

al., 2017; Zuo & Meng, 2015). This review cannot perform meta-analysis due to a heterogeneity of the included studies, and lacking of RCTs. The decrease in the incidence of pressure injury in developed countries is higher due to nurse compliance, the number and ratio of nurses caring for the number of patients (1:1.96 or 1: 3.24) (Zhang, 2021). Low nurse workload (Lee et al., 2019), support from ICU nursing organizational institution (hospital management conducts continuous audits regarding the performance of nurses) (Amaravadi et al., 2000; Driscoll et al., 2018), The success of pressure injury prevention bundles was influenced by education and training of nurses in prevention bundles, nurse awareness related to pressure injury prevention (Rivera et al., 2020), collaboration with unit-based wound care expertise, audit feedback to doctors, and consistency of nurses identifying pressure ulcer events (Floyd et al., 2021; Krupp & Monfre, 2015). Moreover, The bundle approach is more effective than a single method in the Chinese ICU (Zhang, 2021).

4. 2 Pressure injury intervention strategies

This review describes pressure injury prevention bundle that could reduce the pressure injury incident consisting of 7 intervention components, namely pressure injury risk assessment (1), skin care (2), repositioning (3), nutrition (4), education (6), support surface (5) and medical device maintenance (7).

4.2.1 Scale of pressure injury (1st strategy)

The developed scales for ICU patients are 7, such as Braden, Norton, PURAS, Waterlow, Cubbin Jackson, EVARUCI, and Suriadi Sanda. A meta-analysis by Chen et al. (2016) showed that the Braden scale had a moderate prediction value (AUC of 0.7686, moderate sensitivity (0.80) and low specificity (0.42)) to predict pressure injury risks. While meta-analysis Wei et al. (2020) stated the opposite; to predict pressure injury risk in ICU patients, the Braden scale had AUC of 0.7812, sensitivity of 0.89, and specificity of 0.28. Deng et al. (2017) stated that the Braden scale was more suitable to assess pressure injury in general ward because it evaluated skin damages in seven domains: sensory perception, moistness, activity, mobility, nutrient, and friction, and shear (Gomes et al., 2011; Lewicki et al., 2000).

Components of the Braden scale were absolutely less proper to be applied to ICU patients, the risk factors of pressure injury incident were generally caused by age, some comorbidities, unstable hemodynamic status, sedation, peripheral perfusion change, hypotension, vasoactive and vasopressor medication, frequent incontinence and edema which needed sustainable assessment due to rapidly changing condition of critically ill patients (Hyun et al., 2013; Kim et al., 2013; Manzano et al., 2014; Seongsook et al., 2004). Some studies (Cooper, 2013; Seongsook et al., 2004; Manzano et al., 2014; Shi et al., 2018) stated that the Cubbin & Jackson scale had better validity compared to the Braden scale because the domains in the Cubbin & Jackson scale was specifically used to assess pressure injury in ICU patients. Cubbin and Jackson (1991), Jackson (1999), and Shi et al. (2018) reported that the Cubbin & Jackson scale had a value of sensitivity by 89 % and 61% lower than Braden scale for its specificity. Cubbin & Jackson scale reflected the complex condition of critically ill patients such as patients with comorbidities, unstable hemodynamic status, ventilated, vasoactive medication who needed sustainable assessment due to rapidly changing condition of critically ill patients.

The Suriadi & Sanda scale had three domains, namely interface pressure, temperature, and cigarette smoking history, which effectively detected pressure injury in ICU patients. However, the weakness of this scale was that it was conducted only in one city in a country despite the sensitivity value of 81%, and specificity of 83% (Suriadi et al., 2007). EVARUCI scale had five domains containing consciousness, hemodynamic status, respiratory status, mobility and others (Souza et al., 2018). This scale was effective to screen pressure injuries in ICU patients due to its relatively high predictive value; the ROC value was around 0.938, which was a very good value. However, it had a limitation for its small number of samples. The writers compared scales in this review and concluded that the use of pressure injury risk scale in ICU was better than using prediction capacity. The reduction of pressure injury incidents was pertained to risk factor identification and the use of care intervention to prevent pressure injuries. Therefore, scale identification with a good predictive

capacity would contribute to improving accuracy in care decisions which could provide support in critical care.

4.2.2 Skin care (2nd strategy)

The skin care component of the prevention bundle in this review was taken from some studies. Skin care in the prevention of pressure injury able to reduce the incidence of pressure injury included risk assessments using physical assessments which were done comprehensively from the patient's skin and documented within 24 hours after entering ICUs, and evaluated every shift; bathing the patient using antiseptic soap with 2% of hydrogen perioxide / prepackaged washclotes (pH balanced once per day; giving basic skin moisturizer (petroleum jelly, VCO, sorbolence) every bath (Zuo & Meng, 2015). Foam dressing had the ability to move water vapor out of the dressing to minimalize the accumulation of heat and excess moisture so it could prevent skin maceration in patients with lateral positions. Multilayer materials in foam dressing, i.e., silicon foam composite, could minimalize friction when the dressing touches skin surface and protect skin from mechanical wound (Huang et al., 2015). Ohura et al., (2005) stated that foam could be compressed, but it was easily damaged; it also effectively reduced pressure and friction. Film dressing, based on the review, effectively reduced pressure injury because it was semi-occlusive with multilevel permeability, but it could not be used in patients with high fever and excessive sweat (Sood et al., 2014; Weller et al., 2020). Tayyib et al. (2015) stated that most frequent pressure injuries were located on the sacrum area, tailbone, and heel, so the high-risk of friction was likely to occur. It became a challenge for nurses to protect those areas because dressings were easily saturated, or even dirty. However, some studies had limitations related to this topic. Studies by Avsar and Karadag (2018), Tayyib et al. (2015); and Zakaria et al. (2018) were conducted in a relatively short period, while a study by Loudet et al. (2017) in this review did not document their risk assessment.

4.2.3 Reposition (3rd strategy)

Repositioning was to move a person to a different position to distribute pressure from a certain body parts. Amr et al. (2017) suggested the time distributed for one position was not more than 2 hours. However, the repositioning frequency had to consider the general medical condition, skin condition, and comfort. Repositioning could be a hard duty, so it had to be performed by trained personnel by practicing correct techniques to prevent further pressure injury. A study by Tayyib et al. (2015) in medical ICU found that employment of mobility team consisting of pressure injury prevention nurses, skin care mobility assistants, and patient mobility assistants was pertained to significantly reduce pressure injury in ICUs (6.1% vs. 9.2%, p=0.04). Chaboyer et al. (2018) and Wayunah (2018) found that repositioning in critical care patients (by an hourly-repositioning) only occurred around 50% from time to time. Lateral position often became a choice when intervention and care were frequently performed in ICU, which might contribute to pressure injury incidents in that area. The problem was in the practice of lifting the patient's head until 45° to prevent pneumonia, considering that the position of mechanically ventilated patients received bigger pressure in the sacrum and heel (Gillespie et al., 2012; Lewis et al., 2015). Patients in this position tended to slide down the bed and increased the risk of skin exposure with friction and shear (Lewis et al., 2015). Even though there was no definite evidence of repositioning frequency and determination in critically ill patients, it was clearly shown that regular re-repositioning was important prevention. A study by Al-Dorzi (2019) showed a-2 hour-repositioning reduced pressure injury about 1.35±0.520 compared to control group (1.73±0.790, p=0.000).

4.2.4 Nutritional intervention (4th strategy)

Nutrition components in this review were found only in two studies (Gage, 2015; Siracusa & Schrier, 2011) which included nutrition in pressure injury prevention bundles. These studies reported that nutrition intervention significantly reduced pressure injury (p=0.05). This was correlated to patients with malnutrition status that increased pressure injury risks. Generally, nutrition support had to target prevention or nutrition deficit correction. Based on the circumstantial evidence, guidelines recommended the supply of 30 to 35 kcal/kg weight per day for malnutrition patients or

in malnutrition risk on pressure injuries (Al-Dorzi, 2019; EPUAP et al., 2019). Recommended protein and meta-analysis from eight studies (6,062 patients) which compared mixed nutritional supplement to hospital standard diet did not find an obvious effect from supplemented nutrition in pressure injury development (risk ratio 0.86; confidence interval 95%, 0.73-1.00; p=0.05) (Al-Dorzi, 2019).

4.2.5 Support surface (5th strategy)

Support surface component was based on 10 studies reviewed about pressure injury prevention bundles (Anderson et al., 2015; Gage, 2015; He et al., 2016; Loudet et al., 2017; Lupe et al., 2015; Mallah et al., 2015; Ozyurek & Yavuz, 2015; Tayyib et al., 2015; Uzun et al., 2015). Ozyurek and Yavuz (2015) conducted a study by comparing the efficacy of two viscoelastic beds; one was with two layers, while the other was with three layers. The result showed that there was a significant difference in pressure injury prevention (p=0.44). This was in line with a study by de Camargo et al. (2018) which found that pressure injury incidence with support surface was about 32.2% compared to the group with no support surface 80.6% (p≤0.001); viscoelastic could redistribute pressure and affect micro climate that could reduce skin moisture to prevent pressure injuries. Studies showed that the use of pressure air mattress and pillow to position patients successfully reduced pressure injuries, statistically significant about 4.1-17% (Lupe et al., 2015; Uzun et al., 2015). In a study by Tayyib et al., (2015), the use of support surfaces to manage the weight and pressure of patients along with a-two hour-repositioning reduced the pressure injury incidence for 39%. Also, Anderson et al. (2015) and Tayyib et al. (2015) reported that the use of two air mattresses reduced pressure injury incidence by 2.1%-7.14%. The use of support surface aimed to reduce the duration of pressure between the patient body and support surfaces in pressure injury prevention (McInnes et al., 2015).

4.2.6 Education (6th strategy)

There were not many studies about pressure injury prevention bundles that discussed education component, but the study by Anderson et al. (2015), Tayyib et al. (2015), and Uzun et al. (2015) showed that an education of element bundles to the ICU nurses was an important action that can reduce pressure injury by 2.1% to 39.3%. Giving education was considered important to improve staff awareness in pressure injury prevention. Staff education and training also contribute to the successful result in care improvement and patient outcomes. Education pertained to effective bundles improves care quality because it combines some core interventions to “care package”, like VAP bundle approach to reduce pneumonia pertained to ventilator usage and respiratory tract infections in critically ill patients (Anderson et al., 2015; Tweed & Tweed, 2008).

4.2.7 Medical device (7th strategy)

The incidence of pressure injury due to the use of medical equipment was estimated at about 10-12% (Brooke et al., 2019). According to Padula et al. (2015) the incidence of pressure injury related to the use of medical equipment was about 30-70% and mostly it was caused by external factors. Medical equipment which were usually used in critically ill patients, such as intravenous catheters, splints, niv mask, servical collar, nasogastric tube, and endotracheal tube. A recent study by Hanonu and Karadag, (2016) showed that the incidence of pressure injury related to the use of breathing assist devices was the highest percentage (about 30-70%) started about 3.3 days after administration and 20% of nurses were unaware of the fact that medical devices could also lead to ulcer formation. While a study in the Netherlands Ham et al. (2017) showed that support surface intervention, reposition every 2-4 hours, and nutrition factors gave contribution to the incidence of pressure injury related to immobilized patients, and also the use of manual tightening rope in immobilized patient contributed 20.1% of pressure injury incident. A study by Zakaria et al. (2018) showed that manipulating the position of breathing assist tube will reduce pressure injury from 77.8% to 13.1%.

Tayyib et al. (2021) describe the maintenance of medical equipment in the prevention of pressure injury. The procedures begin with securing medical equipment, protecting the skin with silicon hydrocolloids in areas at high risk of pressure ulcers, and avoiding to directly install medical devices with the patient's skin unless the patient's condition is not possible. Next, checking the skin under the medical device more than 2 times a day, monitoring nutrient intake, and choosing the right

size and type of medical device to suit the patient's condition were conducted. Last, monitoring the incidence and prevalence of pressure ulcers related to the installation of medical devices is carried out in a regular basis (Mehta et al., 2019; Tayyib et al., 2021). Risk identification instrument of pressure injury (Gómez et al., 2017; Jackson, 1999; Lyder et al., 1999; Suriadi et al., 2007) used by most hospitals today was not sufficient to identify the risks of pressure injury related to the attached medical device. There were lots of medical devices which could initiate pressure injuries, and those instruments alone were ineffective to examine and identify pressure injuries in mucus membrane. According to this finding, we need future studies to develop appropriate instruments that can be used specifically to examine and identify patients with a high risk of developing pressure injuries related to medical devices.

5 Implication and limitation

This review may implicate the critical health care providers especially critical nurses and the ICUs for providing comprehensive overview through a thorough and systematic study to prevent pressure injuries in the critically ill patients. Intervention measures, such as risk assessment, skin care, reposition, nutrition, support surface, education, and medical device maintenance could be applied as a bundle of care for the better patient nursing care, compared to the single intervention.

The strength of this review is the importance of raising the topic of the pressure injury prevention bundle guided by the librarian's comprehensive search strategy and the systematic review of this review represents a novelty in synthesizing related literature containing multi-component prevention of pressure injury and incidents of pressure injury in critically ill patients. With these facts, the bundles, by such findings in this review, might be implemented as a multi-intervention alternative to prevent pressure injury in critical care units. This review might be chosen as a reference of Indonesian nursing as a guideline in daily practice.

One considerable limitation from this review was unable to perform a meta-analysis as the included studies varied in the methods and statistical values of the outcomes. From 13 studies, there were only 2 studies which used true high quality RCT method, while other studies used low quality method. In addition, there were so many components of the bundle for pressure ulcer prevention, and each hospital implemented this bundle in various techniques that differ from one hospital to the others. Thus, clinical staffs who were involved in this bundle should have more attention to detail when implementing this bundle to patients with complex medical situations and diseases. There was no single component of this bundle that was proven to be the most effective to prevent the incidence of pressure injuries. The bundle prevention of pressure injury in this review could not show meta-analysis purpose. Besides, this review did not evaluate the working quality of medical and nursing staff while implementing this bundle, but only showed that this bundle prove to be more effective in lowering the incidence of pressure injury in critically ill patients.

6 Conclusion

Pressure injury prevention bundles can reduce the incidence of pressure by 4.3% to 36.2% in developed countries and 4.16% to 25.72% in developing countries. The intervention strategies in the prevention bundles included the risk assessment of pressure injury using the Cubbin Jackson scale, skincare, repositioning, nutrition, education, support surfaces, and medical device care. This bundle was a multi-intervention method of prevention, which consists of 7 components, and still need supervision from higher-rank of nurses in critical care units in order to early detect the incidence of pressure injuries. Although the prevention bundle can reduce the incidence of pressure injuries, this review found that scientific evidence of its effect is still lacking. Only 2 studies used high quality RCT. Therefore, it is recommended to conduct randomized clinical trials for next studies to investigate the effect of prevention bundles to reduce the incidence of pressure injury.

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Author contribution

WT: data searching, articles' selection, data extraction, quality appraisal, data analysis, manuscript writing; RR: study design, quality appraisal, data analysis; NR: study design, articles' selection, data extraction, quality appraisal, data analysis, manuscript writing

Conflict of interest

The authors declare that there are no conflicts of interest.

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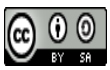

Appendix 1.

Table 1. Data extraction

No	Author, Year	City/ Country	Aim	Design	Sample & Setting	Intervention	Main/Results	Outcomes
1	Chaboyer et al., (2016)	Australian	To examine the effectiveness of InSPIRE protocol in reducing PI in critical care.	Pragmatic cluster randomized trial	1600 (200/ hospital) 8 ICU hospital at Australia	Reposition (3), pressure injury assessment (1), nutrition (4), & education (6)	Incident pressure injury in the control group was 12% and in the intervention was 7.7%. The latest hazard pressure injury incidence ratio was 0.58 (95% CI; 0.25,1.33; p = 0.198). No adverse events were reported.	Incident & Intervention
2	Tayyib et al., (2015)	Saudi Arabia	To evaluate the effect of a prevention bundle on the reduction of PI in critical care.	Two-Arm Cluster Randomized Control Trial	140 ICU in Arab Saudi	Pressure injury assessment (1), skin care (2), reposition (3), support surface (5), education (6) & medical devices care (7)	The incidence of pressure injuries in the intervention group was 7.14% and the control group was 32.86% from 784 days of observations. Poisson regression reveal the incidence of pressure injuries in the intervention group was 70% lower. The intervention group experienced a significant decrease in stage 1 (p=0.002) and stage 2 (p=0.026).	Incident
3	Anderson et al., (2015)	Minneapolis, Minnesota	To investigate the effectiveness of the universal Pi prevention bundle along with the semi-weekly nurse round.	Pre-post quasi-experimental	327 (pre : 181 and post : 146) 3 ICU in Minnesota	Pressure injury assessment (1) and skin care (2) & support surface (5)	The incidence of pressure injuries decreased from 15.5% to 2.1%. Data analysis revealed a significant increase in adherence related to heel elevation (t = -3,905, df-325, p <0.001) and repositioning (t = -2.441, df-325, p<0.015). Multivariate logistic regression decreased significantly (p <0.001). Increased intervention of the Nagelkerke R-Square value of 0.099 (p <0.001) more than 0.297 (p <0.001), the final model value of 0.396 (p <0.001).	Incident & intervention
4	Amr et al., (2017)	Saudi Arabia	To evaluate the effectiveness of pressure ulcer prevention measures ('PRESSURE bundle") compared with standard care in reducing the incidence and prevalence of sacral pressure ulcers in critically ill patients in an ICU.	Pre-Post	690 (360 at intervention group and intervention group & 330 standard care group)	pressure injury assessment (1), reposition (3), skin care (2) & nutrition (4)	The incidence of pressure injuries in the control and intervention groups decreased by around 4.6% to 0.3%. There was a significant decrease of approximately (p<0.0001) in the incidence of pressure injuries in the sacral at 2 months of treatment (n=1, 0.3%) compared to the control group around 4.6% (n 16, 4.6%). There was a significant reduction in the incidence (p<0.001). The incidence of pressure injuries in the sacral area of the intervention group was 4.75%.	Incident, intervention & cost

Table 1. Continued

No	Author, Year	City/ Country	Aim	Design	Sample & Setting	Intervention	Main/Result	Outcome
5	Avşar & Karadağ, (2018)	Ankara, Turkey	To determine the cost-effective and efficacy of evidence based nursing intervention on increased tissue tolerance by maintaining tissue integrity.	Quasi-experimental	154 (77 control group & 77 intervention group)	Pressure injury assessment (1), skin care (2) & reposition (3)	The incidence of pressure injuries in the control group was 54.5% and the intervention group was 18.3% ($p<0.05$). The incidence of pressures injuries in the intervention group with skin integrity was 13%, the incidence of MDRPU pressure injuries was 3.9%. While in the control group, the incidence of pressure injuries in skin integrity was 33.8% and MDRPU was 31.2% ($p=0.002$), he reposition time of the intervention group ($x=86.66 \pm 29.55$ min) is higher than the control group ($x=71.81 \pm 40.32$ min); the treatment time for the intervention group was longer ($x=31.57 \pm 15.44$ min, $p=0.000$.	Incident intervention & cost
6	Mallah et al., (2015)	Lebanon	To determine the efficacy of multidisciplinary intervention and to assess which component of the intervention was most predictive the prevalence of HAPU in a tertiary setting in Lebanon	Controlled before and after prospective	468 respondents during 2 months	Reposition (3), nutrition (4), support surface (5), skin care (2), & pressure injury assessment (1)	The prevalence of pressure injuries decreased significantly from 6.63% to 2.47%. Multiple logistic regression found a prediction equation of two factors that significantly caused HAPU, namely risk assessment (Braden) OR 1.187 (CI = 1.031-1.546, p-0.03), and skin care OR = 0.058 (CI = 0.036-0.092, p = 0.04 with R2 = 12. The incidence of pressure injuries in coccyx sacrum (50%), heel (25%), ischial tuberosity (8%), occiput (8%) and earlobe (8%).	Incident & Intervention
7	Swafford et al., (2016)	United States	To evaluate the effectiveness a year-long PI prevention program	Prospective	2011= 461 2012 = 434 2013= 563	pressure injury assessment (1), skin care (2), reposition (3) & education (6)	The incidence of pressure injuries decreased 69% (from 45 patients around 10% to 17 patients around 3%). The incidence of pressure injures related to oral ETT in the intervention group was around 9/28, whereas in the control group 27/30 p = 0.031, while the incidence of pressure injuries related to NGT in the control group was 35/45 with an incidence of 77.8%, in the intervention group 5/38 with p = 0.012.	Incident & Intervention
8	Rogenski et al., (2015)	San Paulo, Brazil	To assess the impact of PI prevention protocol among critically ill patients	Prospective quasi experimental	78 respondent during 4 moth in ICU Brazil	pressure injury assessment (1), skin care (2), & reposition (3)	The reported incidence of pressure injuries was around 41.02%, decreasing around 23.1%. the incidence of pressure injuries in the 36.8% sacral region, calcaneus 42.1%, buttock 15.8% and trochanter 10.5. Most pressure injury events occurred in stages 2 and 3 (66.4%). Interpretation of the Braden scale logistic regression coefficient in the high risk category 3.24 with p = 0.002, OR 25.50.	Incident & intervention
9	Uzun et al., (2015)	Turkey	To determine the effect of an educational intervention on the incidence of stage II Pus in adult patients in ICU in Turkish medical center	Prospective quasi experimental	186 respondent ICU medical in Turkey	pressure injury assessment (1), reposition (3), skin care (2), & support surface (5)	The incidence of pressure injuries in the control group was 37% and the interventions group was 17% with significant differences ($\chi 2$ = 8.86, t = 0.593, p = 0.554), pressure injuries generally occurred in the sacrum 46%, trochanters 11% and in the heel 7%, interventions that decreased the occurrence of pressure injuries in this article is detection of pressure injuries, and repositioning.	Incident & intervention
10	Gage, (2015)	London, U.K	To prevention and management of pressure ulcers in intensive care units	Prospective quasi experimental	The study was conducted at the ICU for 22 months	pressure injury assessment (1), skin care (2), nutrition (4), support surface (5), & education (6)	The incidence of pressure injuries decreased significantly from 18 cases to 2 cases from 2011 to 2013.	Incident & intervention

Table 1. Continued

No	Author, Year	City/ Country	Aim	Design	Sample & Setting	Intervention	Main/Result	Outcome
11	Vasconcelos & Caliri, (2017)	João Pessoa, Paraíba	To evaluate the actions of nursing professionals before and after using a protocol for preventing PI in an ICU	Prospective, comparison before and after	Pre: 38 respondent Post: 44 respondent for 18 months	assessment (1), reposition (3), skin care (2), & education (6)	The incidence of pressure injuries was not explained; the risk assessment of pressure injuries was recorded at around 57.9% in the pre phase and 77.3 in the post phase.	Incident & intervention
12	Coyer et al., (2017)	Australian	To test the effectiveness of a bundle combining best available evidence to reduce incidence of incontinence-associated dermatitis occurrence in critically ill patient	Comparison before and after	207 in the Australian ICU in the group before 66 patients for 733 days, while in the group after 80 for 768 days	Skin assessment and skin care (2) pressure injury assessment (1), & reposition (3)	The incidence of pressure injuries before being given an InSPIRE intervention was around 32%, whereas after being given the intervention, it was around 15% ($p = 0.016$), ($\chi 2 = 5.847$, $df = 1$, $p = 0.016$; there was a significant difference of 17%. There was a significant difference in the interventions for giving acrylate polymer based prophylactic in reducing the incidence of pressure injuries by about 94% in episodes of bathing patients in the intervention group.	Intervention
13	Siracusa & Schrier, (2011)	Pennsylvania	To design an evidence-based PI prevention bundle based and determine its effectiveness on reducing Pi	Quasi-experimental	1199 respondents	Pressure injury assessment (1), reposition (3), skin assessment and skin care (2), & nutrition (4)	The incidence of pressure injuries in the quarter 1 control group was around 5.7%, quarter 2 was around 0.0%, quarter 3 was around 5.2%, quarter 4 was around 0.0% ($p = 0.11$). The incidence of pressure injuries in the intervention group (PUB): Quarter 1 around 0.0%, quarter 2 around 0.9%, quarter 3 around 0.0% and quarter 4 around 0.0%, reducing the incidence of pressure injuries around 1%.	Incident
14	He et al., (2016)	Hangzhou, China	To determine whether skin barrier factors were associated with the common complication of PrUs in ICU	Single center (pre and post)	102 patients in postoperative ICU (54 men and 48 women)	Pressure injury assessment (1), reposition (3), skin care (2), & support surface (5)	The incidence of pressure injury incidence of 62.5% decreased by about 31.4% ($p = 0.031$); this incident in male sex (33%) was more at risk of developing pressure injuries than women (29.2%) ($p = 0.031$). The incidence of pressure injuries in the scapula was around 0.4% ($p=0.058$), sacral around 0.5% ($p<0.001$), hip 0.7% ($p<0.001$), and heel 0.3% ($p=0.062$). Braden scale has a significant difference between patients who have pressure injuries and patients who do not have pressure injuries ($p<0.001$).	Incident
15	Lupe et al., (2015)	Miami	To identify the prevalence of HAPU at the institution and to implement interventions to reduce the incidence of HAPU	Retrospective with control group	305 respondent in Hill Room	Skin care (2), reposition (3), support surface (5), pressure injury assessment (1) & education (6)	The incidence of pressure injuries in April 2009 was around 11.7%, and decreased around 2.8% in September 2012.	Incident

Table 1. Continued

No	Author, Year	City/ Country	Aim	Design	Sample & Setting	Intervention	Main/Result	Outcome
16	Loudet et al., (2017)	Buenos Aires, Argentina	To determine the effectiveness of a quality management program in reducing the incidence and severity of pressure ulcers in critical care patients	Quasi experimental	154 (55 in the pre group and 69 post groups) in the ICU	Skin care (2), reposition (3), & support surface (5)	The incidence of pressure injuries from the pre 75% group decreased to 54% (p=0.016); In the post group using pressure-reducing mattresses increased from 48% to 85%; family participation increased from 9% to 39%.	Incident & intervention
17	Lewis et al., (2015)	Saudi Arabia	To identify PU incidence and risk factors that associated with Pu development in patients in two adults ICU in Saudi Arabia	Prospective cohort stuy	84 participants for 30 days	Pressure injury assessment (1), skin care (2), support surface (5), & reposition (6)	The cumulative incidence of pressure injuries was 39.3% (33/84). The incidence of pressure injuries in patients with medical devices was 8.39%; the incidence of pressure injuries in the sacrum area was 24.3% and heels 29.2%, and in the ear area was 37.5%.	Incident

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ORIGINAL RESEARCH

Relationship between Quality of Life, Depression, and Participation in Elderly Integrated Health Service Post among Older Adults

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Abstract

Background: Older adults are susceptible to worsened quality of life (QOL) and depression due to aging. Elderly integrated health service post (EIHSP) is community-based health care that aims to improve older adults' health; however, not all older adults participate in this health service.
Purpose: This study was conducted to assess the relationship between the QOL, depression level, and older adults' participation in EIHSP.
Methods: A cross-sectional study was carried out among 102 older adults in a community-dwelling area in Semarang, Indonesia. Respondents were recruited using a total sampling technique. QOL was assessed by the WHOQOL-BREF questionnaire, while the level of depression was assessed by Geriatric Depression Scale (GDS) questionnaires. Descriptive statistics, Spearman, and Sommers' d tests were used to analyze the data.
Results: Higher participation in EIHSP significantly affected QOL on every domain (general quality of life, physical, psychological, social relationship, and environmental domains) with $p<0.05$. This study also showed that participation in EIHSP had a significant relationship with depression levels ($p=0.002$). Furthermore, higher depression levels significantly affected QOL on every domain ($p<0.05$).
Conclusion: This study showed that older adults' participation in EIHSP had a significant relationship with QOL and depression. Community nurses can promote the utilization of EIHSP among older adults for better physical and mental health. Future studies should investigate these relationships in a larger sample size.

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1. Introduction

The increase in aging population has become a global phenomenon (Beard et al., 2016). With the 4th largest population in the world, Indonesia is also facing the challenge of a rapidly increasing older adult population (Ministry of Health Republic of Indonesia, 2016b). In 2019, the total of older adults in Indonesia reached 9.6% of the total population, or approximately 25.64 million people (Basic Health Research, 2019). Furthermore, it is expected that the number of people aged ≥60 years old would keep increasing to 36 million by 2025 (Statistics Indonesia, 2014).

Aging can cause many health problems, thus reducing the quality of life (QOL) of older adults. QOL rates an individual's satisfaction about general well-being, which includes many aspects, such as physical, mental, social, emotional, and functional well-being (Karimi & Brazier, 2016). A previous study showed that the decline of QOL throughout aging was associated with increased depression, increased physical illness, and difficulties with activities of daily living (ADL) (Campos et al., 2014). In addition, higher levels of social support have been shown to have a lower risk of mental disorders, physical disease, and improved QOL (Onunkwor et al., 2016). Depression is the most common mental disorder that older adults experience. According to the Ministry of Health of the Republic of Indonesia, the highest prevalence of depression in 2018 occurred among older adults who were 75 years and older (8.9%) (Ministry of Health Republic of Indonesia, 2018).

To manifest healthy aging in Indonesia, the Ministry of Health launched the National Strategic Plan for the Health of Older Adults through the Regulation No. 25/2016, which encouraged the establishment of Elderly Integrated Health Service Post (EIHSP) as long-term care for older adults (Ministry of Health Republic of Indonesia, 2016a). EIHSP, which has been endorsed as *Posyandu Lansia* in Indonesia, is a community-based clinic at the village level initially providing health services for older adults (Erpandi, 2015). EIHSP aims to improve the health status of older adults by offering not only promotive and preventive but also some basic curative and rehabilitative health services (Pratono & Maharani, 2018). This health service post has several activities, such as physical exercise, health check-ups, counseling, nutritional program, and leisure time (Sumini et al., 2020). By joining EIHSP, older adults can also have peer group interactions which allow them to share their feelings and ideas (Rahmawati & Bajorek, 2015). Previous studies stated that peer counseling and social engagement were found to be effective in relieving depressive symptoms and improving the QOL of community-dwelling older adults (Chapin et al., 2013; Joo et al., 2016; Wang et al., 2014). An older adult who is engaged in social participation also tends to be avoided from depression (Gallegos-Carrillo et al., 2019; Perez-Sousa et al., 2020; Puciato et al., 2017). Peer group interaction and social participation provide many benefits for older adults, including emotional support, empowerment, and social network expansion (Fisher et al., 2015). Peer support can significantly reduce loneliness, improve mood scores, and increase the level of physical activity (Geffen et al., 2019). In addition, social participation increases the number of roles, thereby helping older adults keep active, preserve functioning, and maintain physical QOL (Kanamori et al., 2014).

Despite the many benefits of EIHSP, the utilization of this preventive care is still low among older adults (Chen et al., 2013; Lee et al., 2019). Various studies showed that most older adults in Indonesia did not utilize EIHSP adequately (Mulyadi, 2009; Simbolon & Simbolon, 2018; Wahyuni et al., 2016). Lack of attitude, the poor role of the cadres, and lack of family support were shown to be the factors for not utilizing this kind of service (Cahyawati et al., 2020). Other reasons for not participating in EIHSP are lack of transportation and a preference for private clinics (Pratono & Maharani, 2018). Meanwhile, a previous study conducted in Indonesia showed that most of older adults still had low QOL (Hidayati et al., 2018). To the best of our knowledge, this is the first study to investigate the relationship between QOL, depression, and EIHSP participation in older adults all at once. Overall, this research is crucial because it provides an overview of the role and involvement of EIHSP in older adults' QOL and depression. Accordingly, this study aimed to analyze the relationship between QOL, depression levels, and older adults' participation in EIHSP.

2. Methods

2.1 Research design

A cross-sectional study was carried out at a community-dwelling area in Semarang, Indonesia. This area was selected as it provided EIHSP service *(Posyandu Lansia).*

2.2 Setting and samples

This study investigated the relationship between QOL, depression, and participation in EIHSP among older adults. There were 102 older adults involved as the participants of this study. They were recruited by a total sampling method to describe a much more complete picture and reduce the risk of biased sample selection. The inclusion criteria of the participants were (1) aged 60 years old or older, and (2) able to communicate. Those who fulfilled these criteria and agreed to participate were asked to fill the questionnaires given. Those respondents who could not read/and or write were helped to fill the questionnaires based on their interview answers. Older adults who did not fulfill the inclusion criteria were excluded from this research.

2.3 Measurement and data collection

This study collected data about socio-demographic, participation in EIHSP, QOL, and depression of the respondents in June 2020. The data were collected by socio-demographic questionnaire, the World Health Organization Quality of Life (WHOQOL)-BREF questionnaire, and Geriatric Depression Scale (GDS) questionnaire. The socio-demographic form was used to report the respondents' characteristics, such as gender, age, and marital status. To obtain data on participation, this study used the attendance list of EIHSP. The respondents were categorized into

three groups: not active (≤ 6 participations in 12 months), moderately active (7-9 participations in 12 months), and active (10-12 participations in 12 months).

The WHOQOL-BREF questionnaire was used to assess the QOL. This study used the Indonesian version of the WHOQOL-BREF questionnaire. This questionnaire consists of 26 questions. Two questions measure respondents' perception of their general quality of health (GQOL), and the remaining 24 questions measure QOL in four broad domains: physical (7 items), psychological (6 items), social relationships (3 items), and environmental (8 items). Each item is scored from 1 to 5. Higher scores reflected the higher quality of life. The WHOQOL-BREF has been widely used in Indonesia and has been proven as a valid and reliable questionnaire to be used in Indonesia (Purba et al., 2018). The Cronbach's alpha value for each domain of this questionnaire ranges between 0.41 and 0.77, while the Pearson's correlation coefficient ranges between 0.5 and 0.7 (Salim et al., 2007). The result score of GQOL was converted into sten scores (1-10 stens). The obtained sten scores were used to classify participants into groups with different ranges of perception of GQOL: low (scores <6), medium (scores 6), and high (scores >6).

To assess depression in older adults, this study used the Indonesian version of the GDS questionnaire. The Cronbach's alpha of this questionnaire was 0.80, while the Pearson's correlation items total score was significant at 0.05 (p<0.05) (Pramesona & Taneepanichskul, 2018). GDS consists of 15 questions and the total score ranges from 0-15. Participants were categorized into four groups based on the GDS score: normal (scores 0-4), mild depression (scores 5-8), moderate depression (scored 9-11), and severe depression (scores 12-15).

Before conducting the survey, the objective of this study was informed to all potential participants over the telephone calls, SMS, and Whatsapp group of this area to ensure the maximum cooperation. To reduce the COVID-19 transmission, this research was conducted in compliance with the health protocols, such as 2-meter distancing, wearing a mask, and sanitizing hands. The questionnaires were given to each respondent by the door. If further interviews were needed, both researcher and respondent would always follow the health protocols. The researcher always conducted a rapid COVID-19 test and had a temperature check before collecting the data each day.

2.4 Data analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. The characteristics of respondents were presented using descriptive statistics. Continuous variables were presented as means and standard deviations (SDs). Spearman and Sommers' d tests were used to analyze the relationship between QOL, depression level, and older adults' participation in EIHSP. Inferences were drawn at a significance level of <0.05.

2.5 Ethical considerations

This study obtained ethical approval from the Health Research Ethics Committee of Faculty of Medicine, Universitas Diponegoro (Ref. No. 40/EC/KEPK/FK-UNDIP/IV/2020). Complete explanation and description of the purpose of the study, methods, and benefits of the study were given to all respondents. All respondents signed informed consent to participate in this study.

3. Results

3.1 Demographic characteristics of respondents

Table 1 shows the characteristics of respondents of this study. The majority were women (60.8%), aged 60-69 (77.5%), married (67.6%), and inactive in participating in EIHSP (51%). Most respondents had low GQOL (54%). The mean of physical, psychological, social relationship, and environmental domains were 63.6, 65.01, 57.72, and 60.42, consecutively. About 76% of respondents did not experience any depression.

3.2 Relationship between QOL and participation in EIHSP among respondents

Table 2 shows the relationship between QOL and participation in EIHSP among older adults. QOL assessment was classified into five assessments: assessment on general quality of life (GQOL), physical domain (PHYD), psychological domain (PSYD), social relationship domain (SD), and environmental domain (ED). Older adults' participation in EIHSP had significant relationships with QOL on every domain (GQOL, PHYD, PSYD, SD, ED).

Table 1. The demographic characteristics of respondents

Variable	f(%)	Mean ± SD	Median (min-max)
Sex			
Men	40 (39.2)		
Women	62 (60.8)		
Age		66.69 ± 5.57	65 (60-85)
60-69 years old	79 (77.5)		
≥70 years old	23 (22.5)		
Status			
Married	69 (67.6)		
Widowed	33 (32.4)		
Participation in EIHSP			
Not active	52 (51)		
Moderately active	27 (26.5)		
Active	23 (22.5)		
Quality of Life			
GQOL			
• Low	55 (54)		
• Moderate	34 (33)		
• High	13 (13)		
Physical domain		63.6±12.28	63 (25-94)
Psychological domain		65.01±10.99	62 (50-94)
Social relationship domain		57.72±13.44	56 (25-81)
Environmental domain		60.42±11.74	63(31-88)
Level of depression			
Normal	78 (76)		
Mild depression	20 (20)		
Moderate depression	4 (4)		
Severe depression	-		

The relationship between QOL and participation in EIHSP among older adults is shown in Table 2.

Table 2. Relationship between QOL and participation in EIHSP among respondents

Variable	Quality of Life						
	GQOL (%)			Domain (X̄±SD)			
	Low	Medium	High	Physical domain	Psychological domain	Social relationship domain	Environmental domain
Participation							
- Not active	67.3	28.8	3.8	58.5±9.4	62.1±8.3	51.9±11.2	56±10.2
- Moderate	51.9	40.7	7.4	63.3±8.9	63.4 ±9.4	59.2±11.7	62.1±10.5
- Active	26.1	34.8	39.1	75.7±13.3	73.2±13.9	68.9±12.6	68.3±11.9
P-value		<0.001[a]*		<0.001[φ]*	0.003[φ]*	<0.001[φ]*	<0.001[φ]*
R		0.335[a]		0.461[φ]	0.296[φ]	0.494[φ]	0.431[φ]

[§] *Sommers' d,* [φ]*Spearman,* [*]*p*<0.05

3.3 Relationship between depression and participation in EIHSP among respondents

As shown in Table 3, there was a significant relationship between depression and older adults' participation in EIHSP (p<0.001, r=-0.225). Participation in EIHSP had a negative impact on depression. Respondents who participated more in EIHSP had lower depression levels.

3.4 Relationship between older adults' level of depression and QOL

This study investigated whether there was a relationship between the level of depression and QOL. As presented in Table 4, the level of depression had significant relationships with every domain of QOL, including GQOL (p<0.001, r=-0.491), physical domain (p=0.001, r=-0.334),

psychological domain (p=0.003, r=-0.296), social relationship domain (p=0.003, r=-0.290), and environmental domain (p<0.001, r=-0.363). According to these results, the more severe the depression an older adult experienced, the worse quality of life this person had.

Table 3. Relationship between depression and participation in EIHSP among respondents

Variables	Level of Depression (%)			*P*-value	R
	Normal	Mild	Moderate		
Participation					
Not active	63.5	28.8	7.7	0.001*[a]	-0.225[a]
Moderate	88.9	11.1	0		
Active	91.3	8.7	0		

[a]*Sommers' d, *p<0.05*

Table 4. Relationship between older adults' level of depression and QOL

Level of Depression	Quality of Life						
	GQOL (%)			Domain (X±SD)			
	Low	Medium	High	Physical domain	Psychological domain	Social relationship domain	Environmental domain
Normal	42.3	41	16.7	65.7±11.7	66.7±11.3	60.1±13	62.7±11.3
Mild	90	10	0	58.9±9.7	59.7±7.5	50.3±11.2	52.7±10.22
Moderate	100	0	0	47.0±16.6	57.7±8.0	46.7±14.7	53.2±8.14
P-value		<0.001*[a]		0.001*[φ]	0.003*[φ]	0.003*[φ]	<0.001*[φ]
R		-0.491[a]		-0.334[φ]	-0.296[φ]	-0.290[φ]	-0.363[φ]

[a] *Sommers' d, *p*<0.05

4. Discussion

This study aimed to explore the relationship between QOL, depression, and participation in EIHSP among older adults. The results of this study showed that older adults' participation in EIHSP had significant relationships with QOL and depression.

Our study showed that there were significant relationships (p<0.05) between older adults' participation in EIHSP activities and QOL (GQOL, PHYD, PSYD, SD, and ED). An older adult who was more active in participating in EIHSP activities had better QOL. Previous study suggests that people who engage more in healthier behaviors and preventive measures have better health and higher life satisfaction (Kim., 2015). Another recent study which analyzed the relationship between the utilization of preventive health care with health-related quality of life (HRQOL) obtained similar results to the present study; there was a significant relationship between the utilization of preventive health care with many domains, such as physical functioning (PF), role-physical (RP), bodily pain (BP), social functioning (SF), role-emotional (RE), vitality (VT), and general health (GH), except for mental health (MH) (Gallegos-Carrillo et al., 2019). However, our study used WHOQOL-BREF to assess the quality of life where the classification of the domains of quality of life is different from HRQOL. EIHSP holds an exercise program whose goal is to increase the health degree of older adults. A previous study also reported that public physical exercise programs could improve older adults' self-esteem and provide opportunities for social relationship, thus contributing to the improvement of their QOL (Costa et al., 2018).

The present study also showed that there was a relationship between older adults' participation in EIHSP activities and their level of depression. Older adults who were less active in participating in EIHSP activities were more likely to experience depression compared to those who were more active. This finding is similar to a previous study, suggesting that group-based psychosocial programs in primary health care can effectively prevent depression and anxiety in older people (Saldivia et al., 2019). EIHSP activities range from physical activity and health check-ups to psychosocial programs, which would benefit the physical and psychological health of older adults. Another study also showed similar findings, suggesting that physical activities could prevent and alleviate depressive symptoms (Alexandrino-Silva et al., 2019). Furthermore, EIHSP is a form of social participation that is evident to be able to reduce depression in older adults by

preventing them from loneliness and feeling abandoned. Aside from that, older adults can also get social support from their environment while participating in EIHSP activities, thus preventing older adults from depression (Liet al., 2018; Liu et al., 2016). This support helps alleviate chronic or acute life stressor, encourage management behaviors, and cope with negative emotions (Dennis, 2003; Fisher et al., 2015). A recent study also showed that peer counseling, social engagement, and combination interventions at the community level were effective in alleviating depressive symptoms (Carandang et al., 2020).

Depression also had significant relationships with QOl of older adults. The more severe of depression that older adults experienced, the worse quality of life they had (GQOL, PHYD, PSYD, SD, and ED). This study had a similar result to a previous study, which stated that there was a significant relationship between the level of depression and QOL where the increased level of depression would be followed by the decrease of QOL (Chang et al., 2015). Our study showed that the correlation between the level of depression and PHYD was stronger than the correlation between the level of depression and PSYD. It has been argued that in older adults who experience depression, the somatic symptoms are more prevalent than the affective and cognitive ones (Schaakxs et al., 2017). However, the clinical presentations of somatic symptoms in depressed older adults can be overlapped with the clinical presentations of decreasing physical conditions caused by aging. Chronic illness that an older adult experiences can show similar symptoms with the somatic symptoms that a depressed older adult shows (Hazell et al., 2019). For that reason, further study is needed to analyze the correlation between the onset of chronic illness and depression symptoms in older adults.

Considering the benefits of the EIHSP as preventive health care, its utilization should be improved. In community health care, nurses play an important role alongside other professional healthcare workers. As a specialty field of nursing, community health nursing adds public health knowledge and skills that address the needs and problems of communities and focuses care on communities and vulnerable populations (Allender et al., 2010). In Indonesia, the main objective of community health nursing service is to guide and educate people in the community to implement a healthy lifestyle in order to maintain and improve their health status (Effendy & Makhfudli, 2009). According to the Indonesian Ministry of Health, community nurses can serve in every order of the health care, including EIHSP (Ministry of Health Republic of Indonesia, 2006). Therefore, in order to promote healthy aging, the community nurses should also concern older adults within communities (Manasatchakun et al., 2018). Nurses should be the support for older adults to live the way they want to be as independent peopleFurthermore, it is important for nurses to not only focus on treating older adults but also maintaining their physical, psychological, cognitive, and social wellbeing (Wu et al., 2020). Community health nurses also need to focus on improving autonomy in elderly care and perform a professional nursing assessment. Through this systematic assessment, nurses can see the potential and abilities of each individual and prolong their independent living (Kim et al., 2016). Since depression among other adults is often underdiagnosed, community health nurses play a key role in assessing individuals' state of mind and addressing their mental health problems (Barker et al., 2014). Social and emotional support should also be given by nurses to reduce the risk of depression among older adults (Grundberg et al., 2016). A previous study showed that leadership skills and thinking system were reported to be the most important priorities of eight domains of community health nurses' competencies in Indonesia (Widyarani et al., 2020). This means that community health nurses are expected to have good leadership skills for the success of the health program in the area. Collaborative care with other health care professionals is also crucial to improve the health status of older adults.

5. Implication and limitation

This study has provided an insight into how participation in EIHSP can affect the QOL and mental health of older adults. Therefore, it is encouraged for the government and health care professionals, including general practitioners and community health nurses to promote the utilization of EIHSP among older adults.

This study has a limitation in which its samples were collected from one community-dwelling in Semarang. Therefore, the result of this study cannot be generalized on bigger subjects since one place can differ from another in cultural and spiritual value, which can influence the quality of life and depression.

6. Conclusion

This study showed that older adults' participation in EIHSP had significant relationships with the QOL and depression. Community nurses can promote the utilization of EIHSP among older adults for the better physical and mental health. Future studies should investigate these relationships in a larger sample size.

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Author's contribution

All authors were involved sufficiently in the concept, design, data analysis, writing, and revision of the manuscript.

Conflict of interest

None.

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ORIGINAL RESEARCH

Revisiting Job Satisfaction and Intention to Stay: A Cross-Sectional Study among Hospital Nurses in the Philippines

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Abstract

Background: The global shortage of nurses and the rapid turnover of nurses remain crucial issues and areas of concern that call for immediate attention. Job satisfaction is a recognized determinant of nurses' decision to stay in their current workplace. However, while nurses' job satisfaction has received considerable attention among scholars, the results of studies are still mixed.
Purpose: The purpose of this study was to revisit and assess the job satisfaction and intention to stay of nurses in two selected hospitals in the Philippines.
Methods: A cross-sectional research design was used in this study. A sample of 120 nurses in a public and private hospital in the Philippines responded to the Job Satisfaction Survey and Intent to Stay Scale questionnaires. Descriptive statistics, t-test, one-way ANOVA, and Pearson's r were employed for data analysis.
Results: Results show that the majority (58.3%) of the nurses were neither satisfied nor dissatisfied with their job. Also, nurses intended to neither stay nor quit in their current workplace with only a few (9.2%) had high intention to stay. Nurses were most satisfied in terms of the nature of their job (18.95+2.50) but were dissatisfied with the fringe benefits (12.69+4.11) and operating conditions (12.18+2.58) at work. Nurses in the public hospital (p=0.040) and those with higher salaries (p=0.015) had significantly higher intentions to stay. Job satisfaction and intention to stay were significantly related (p=0.002).
Conclusion: Nurses' job satisfaction is positively linked with their intention to stay in their current workplace. This study highlights that efforts should be made to improve nurses' job satisfaction to encourage nurses to remain in their current workplace. Also, increasing nurses' salary particularly those nurses in the private sector is a focal point of consideration to ensure that there is enough supply of nurses in the country.

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1. Introduction

The effectiveness and efficiency of the healthcare delivery system are affected by the high turnover and shortage of nurses. The nursing workforce is an indispensable part of healthcare making up 59% of the healthcare workforce (Haddad et al., 2020; World Health Organization [WHO], 2020a). However, the nursing profession continues to face shortages both globally and locally due to several factors including high turnover (Haddad et al., 2020). According to the WHO (2020a), there is a global shortfall of 5.9 million nurses, and those countries that suffer the most acute nurse shortages are low and lower-middle-income or developing countries.

Nursing turnover is a critical area of concern because nursing shortages lead to poor patient outcomes and higher rates of errors, morbidity, and mortality (Asegid et al., 2014; Haddad et al., 2020). The Philippines is a major exporter of nurses worldwide (Lorenzo et al., 2007; Ubas-Sumagasyay & Oducado, 2020). However, even the world's supplier of nurses like the Philippines also struggles with the nursing shortage problem. A study has shown those nurses' reports of low nurse and large patient ratio resulting in longer working hours suggests the existence of a nursing shortage in the country (Legaspi, 2019). Staffing and resource adequacy was also reported as the lowest aspect of the practice environment of Filipino nurses in another study conducted in Zamboanga, Philippines (Barandino & Soriano, 2019). Unless greater investment is done to retain nurses in the Philippines, the anticipated shortage of nurses in the country is expected to be

249,843 up to 290,000 by 2030 (WHO, 2020b; Philippine Overseas Employment Administration, 2020). The annual migration of at least 13,000 health workers contributes to this deficit (Philippine Overseas Employment Administration, 2020). The migration of nurses abroad leaves hospitals in the country the demands of efficient use of resources (Ubas-Sumagasyay & Oducado, 2020) and greater investment and efforts should be made to retain nurses in the country.

Job satisfaction is a factor associated with the problems encountered in the recruitment and retention of nurses (Asegid et al., 2014). Nurses must operate in a safe and satisfying work environment for them to realize their potential in leading the way to improving health (Woolforde, 2019). However, nurses often work in problematic work environments that can deter nurses' full capacity to provide safe and quality nursing care (Barandino & Soriano, 2019). Besides, when studying the work environment, attention should be given to two specific nurse outcomes: job satisfaction and intent to stay (Al-Hamdan et al., 2017). According to the Theory of Planned Behavior, attitude, in this study nurses' job satisfaction or their attitude towards their job, is considered a significant determinant of behavioral intention (Ajzen, 1991). The nursing shortage is seen as the consequence of having unmet these specific outcomes. Employers and administrators must be able to provide a satisfying workplace that is conducive to the growth and optimal functioning of nurses. After all, nurses are at the frontlines of the health system and excellence in nursing care produces excellent patient outcomes (Al-Hamdan, 2017); Kieft et al., 2014).

Meanwhile, while nurses' job satisfaction has received considerable attention among scholars, the results of studies are still mixed. A study on the work environment of nurses in the Philippines by Dones et al, (2016) has provided interesting yet conflicting insights on the current situation of nurses in the Philippines. The study disclosed that while physiologic and safety needs of the nurses are the areas that require great improvement, nurses are currently highly satisfied with their job and that they intend to remain in their present work environment (Dones et al., 2016). Another study among hospital staff nurses of Zambales, Philippines showed satisfactory results in terms of human relationships, job environment, workload, and benefits and promotions (Devera & Maniago, 2017). Filipino nurses also rated their job satisfaction on a moderate to a high level in the study of Lapeña et al. (2017). However, there are also reports that nurses in the country are overworked and underpaid nurses (Crisostomo, 2020; Ubas-Sumagasyay & Oducado, 2020). A study among the government hospital nurses of Samar, Philippines revealed nurses slightly unsatisfied with their job (Rosales et al., 2013). Despite some studies supporting the claim that nurses in the Philippines are satisfied with their job, migration and turnover rates of nurses are still high. Filipino nurses continuously migrating to other countries have endangered the Philippines quality of patient care services (Labrague et al., 2018a). Among the several reasons of nurses for leaving the country include poor compliance of nursing laws, high patient-nurses ratios, lack of professional growth and opportunities, poor benefits, and low income (Castro-Palaganas et. al, 2017; Labrague et. al, 2018a; Labrague et. al, 2017; Lorenzo et al., 2007). A review study identified three main contributing factors of nurses' intent to stay: nurses' individual characteristics, professional characteristics, and organizational factors (Xue et al., 2020). At this backdrop, steps must be made in preventing high turnover rates of nurses and maintaining a committed nursing workforce (Labrague et. al., 2018b).

Job satisfaction is a recognized factor that influences the decision of nurses to stay in their current workplace (Al Hamdan et al., 2017; Caricati et al., 2014; Mrayyan, 2007). However, is this generalization applicable to Filipino nurses who were reportedly satisfied with their job but still sought opportunities elsewhere and especially abroad? It has also been suggested to look into and compare the job satisfaction and turnover intention of public and private hospitals (Legaspi, 2019). Consequently, the researchers felt the need to revisit and perform an empirical investigation of the current state of nurses' job satisfaction and intention to stay in their current work environment, address the contradicting findings of prior studies, and determine if job satisfaction can influence nurses' intention to stay. This study was conducted to assess nurses' job satisfaction and intention to stay in two selected hospitals in the Philippines. It also aimed to determine whether there are significant differences in nurses' intention to stay based on certain socio-demographic and work-related characteristics and if job satisfaction influences nurses' intention to stay in their current workplace.

2. Methods

2.1 Research design

A cross-sectional survey design was employed in this investigation. The researchers collected the data needed for the study at one point in time to give a snapshot picture (Connelly, 2016) of the job satisfaction and intention to stay of Filipino hospital nurses.

2.2 Setting and samples

A total of 120 randomly selected registered nurses participated in this study. This study was conducted in two hospitals with 150-200 bed capacity in the Western Visayas region of the Philippines. The two hospitals were selected since they were comparable in terms of the maximum number of patients that can be treated by the institution and the Nursing Directors showed interest in the study and granted approval to collect data in their institution. The sample size for this study was initially computed using Slovin's formula $n = N \div (1+Ne^2)$. Inclusion criteria were a registered nurse in the Philippines, currently employed in the hospital, and granted consent to participate in the study. Volunteer nurses or trainees were excluded from the study. With a total population of 212 nurses from both hospitals, the desired sample size for the study was 139. However, only the responses from the 60 nurses from each hospital were included in the study. Some questionnaires that were retrieved had no signed consent forms, others had no answers while the rest had incomplete data or were not fully accomplished. The researchers had the plan to return to the hospitals to gather additional data and complete the missing and lacking questionnaires or replace the samples but this was not done because of the nationwide lockdown as a response to the COVID-19 outbreak. Nonetheless, the 120 participants comprise 86.3% of the total needed sample or 56.6% of the total population of nurses included in the study.

2.3 Measurement and data collection

The Job Satisfaction Survey (JSS) and Intent to Stay Scale (ITSS) were used to gather data for this study. The instruments were administered in the English language. The JSS by Spector (1985) is a 36-item scale with nine subscales or facets measuring nurses' job satisfaction or attitude towards their job. The nine components of the JSS were nature of work, supervision, coworkers, communication, pay, promotion, contingent rewards (performance based rewards), fringe benefits, and operating procedures (required rules and procedures). A summated rating scale format was used and the participants responded from the six options per item ranging from "1-strongly disagree" to "6-strongly agree". Generally, higher scores indicate higher satisfaction. Translated into the summed scores, for the 4-item subscale, 4 to 12 scores are dissatisfied, 16 to 24 are satisfied, and between 12 and 16 are ambivalent. For the total satisfaction, 36 to 108 are dissatisfied, 144 to 216 are satisfied, and between 108 and 144 are ambivalent. The reported internal consistency reliability (coefficient alpha) of the total scale was 0.91 and test-retest reliability of 0.71. The Cronbach's alpha of the entire JSS for this study was 0.88.

The ITSS by Price and Mueller (1986) was also utilized in this study to assess hospital nurses' intention to stay in their current workplace. The ITSS in this study consisted of four (4) items and was presented in a 5-point Likert scale with responses ranging from "1-strongly disagree" to "5-strongly agree". To fit the ITSS for nurses, the term "institution or hospital" was used in the items presented. The ITSS was found to have a high Cronbach's alpha of 0.89 (Markowitz, 2012). Higher scores indicated a higher level of intention to stay. To interpret the findings, the following scale of means was used in this study: 1.00 to 2.33 are intended to quit or low intention to stay, 2.34 to 3.66 are ambivalent or moderate intention to stay, and 3.67 to 5.00 are intended to stay or high intention to stay. A socio-demographic (age, sex, number of dependents, civil status, highest educational attainment) and work-related (monthly salary, type of hospital of present employment, nursing function, employment status, length of service, area of assignment) profile sheet was also utilized to collected nurses' characteristics.

The data for this study were gathered between January to February of 2020. Permission was asked first to responsible authorities (Hospital Administrator and Chief of Nursing Service Office) of each institution before the conduct of the study. Compliance with institutional requirements including ethics approval was taken into account and followed. Once approvals were granted, the researchers then proceeded with the recruitment process and personally distributed the self-administered questionnaires to the participants enclosed in an envelope. Assistance was sought from the Nursing Service Office to ascertain the participants identified in the random selection of

nurses using the lottery technique. Upon distribution of the questionnaires, informed consents were obtained and the participants were reminded that they could contact the researcher for any pertinent information concerning the study. Nurses were given the option to bring home the questionnaires as they requested to do but were informed to return the questionnaires after seven days from the time of the receipt of the research instrument. However, there were some instances when the participants requested an extension of the retrieval of the questionnaire. The contact details were indicated in the questionnaires for the participants to contact the researchers once the questionnaire had been accomplished and ready for retrieval. A maximum of one month was allotted for each institution for data gathering.

2.4 Data analysis

Data were analyzed using the IBM Statistical Package for the Social Sciences (SPSS) version 23. Categorical data were analyzed using frequency and percentage. Mean (M) and Standard Deviation (SD) were also used to describe the data. The median scores were also reported. Given that the sample was drawn randomly and the Kolmogorov-Smirnov test of normality suggested that the data do not deviate significantly from normal distribution, the t-test for independent samples and one-way ANOVA was used to test for differences while Pearson's r was employed to test for correlation between variables.

2.5 Ethical considerations

This study was approved by the Unified Research Ethics Review Committee of the West Visayas State University (2019.GS-I_008). Written informed consent forms were signed by the participants.

3. Results

3.1 Socio-demographic and work-related profile of nurses

Table 1 shows the socio-demographic and work-related profile of the hospital nurses. The nurses had an average age of 30.52 years (SD=5.73), with 1.24 (SD=1.35) number of dependents, monthly income of 17,532 pesos or 350.64 USD (1 USD = 50 PHP), and a length of service or had been working in their current hospital workplace for an average of 46 months. The majority were females (67.5%), single (66.7%), with Bachelor of Science in Nursing degree (95.8%), staff nurse function (89.2%), and regular or permanent employees (67.55). There were an equal number of nurses that responded in both public and private hospitals. 49.2% were from Specialty Units, 42.5% were wards and private rooms, and Nursing Service Office (8.3%).

Table 1. Socio-demographic and work-related profile of nurses

Profile	M	SD	Median	f	%
Age (years)	30.52	5.73	30		
Younger (30 years old and below)				68	56.7
Older (31 years old above)				52	43.3
Sex					
Female				81	67.5
Male				39	32.5
Number of Dependents	1.24	1.35	1		
None				52	43.2
1-2				47	49.2
3 or more				21	17.5
Civil Status					
Single				80	66.7
Married				40	33.3
Highest Educational Attainment					
Bachelor degree				115	95.8
Master degree				5	4.2
Monthly Salary (Pesos)	17,532	7280.0	18,000		
Lower (PHP 17,531 and below)				58	48.3
Higher (PHP 17,532 and above)				62	51.7

Table 1. Continued

Profile	M	SD	Median	f	%
Type of Hospital					
Private				60	50.0
Public				60	50.0
Nursing Function					
Staff				107	89.2
Administrative/Supervisory				13	10.8
Employment Status					
Contractual				39	32.5
Regular/Permanent				81	67.5
Length of service (months)	46	35.22	36		
Less than 24 months				38	31.7
24 to 48 months				35	29.2
48 to 72 months				30	25.0
More than 72 months				17	14.2
Area of assignment or Unit category					
Nursing Service Office				10	8.3
Ward/Private Rooms				51	42.5
Specialty Units				59	49.2

3.2 The Proportion of level of job satisfaction and intention to stay

Table 2 reveals that more than half (58.3%) of the nurses were ambivalent or neither satisfied nor dissatisfied with their job. Moreover, Table 2 illustrates that a big majority (80.8%) of the nurses were ambivalent or neither had the intent to stay nor to quit their current workplace, and only very few (9.2%) had high intention to stay in their current institution.

Table 2. Proportion of level of job satisfaction and intention to stay

Levels of job satisfaction and intention to stay	f	%
Job satisfaction		
Satisfied	42	35
Ambivalent	70	58.3
Dissatisfied	8	6.7
Intention to stay		
Intend to stay	11	9.2
Ambivalent	97	80.8
Intend to quit	12	10

3.3 Components of job satisfaction of nurses

The overall general satisfaction score of nurses was 138.29 (SD=18.34). The satisfaction of hospital nurses on the nine components of the JSS can also be gleaned in Table 3. Nurses were satisfied with the nature of work (M=18.95, SD=2.50), supervision (M=17.78, SD=3.66), and co-workers (M=17.78, SD=2.88) which were ranked first to third respectively. On the other hand, nurses were dissatisfied in terms of the fringe benefits (M=12.69, SD=4.11) and operating conditions (M=12.18, SD=2.58).

3.4 Nurses' intention to stay and influencing factors

Table 4 shows that the general intention to stay of nurses had a mean score of 2.97 (SD=0.58). It is also shown in Table 4 that there was a significant difference in the intent to stay of hospital nurses when grouped according to monthly salary (t=2.078, p=0.040). Nurses with a higher salary of PHP 17,532 and above (M=3.08, SD=0.63) intend to stay than those with lower salaries (M=2.86, SD=0.51). There was also a significant difference in the intent to stay of hospital nurses when grouped according to the type of hospital (t=2.472, p=0.015). Nurses from the public hospital (M=3.10, SD=0.62) had a higher intention to stay than those from the private hospital (M=2.84, SD=0.52). Table 5 also shows that there was a significant positive (r=0.285, p=0.002) correlation between nurses' job satisfaction and nurses' intention to stay.

Table 3. Components of nurses' job satisfaction

Satisfaction	M	SD	Interpretation	Rank
Nature of work	18.95	2.50	Satisfied	1
Supervision	17.78	3.66	Satisfied	2
Co-workers	17.78	2.88	Satisfied	3
Communication	15.54	3.63	Ambivalent	4
Pay	15.06	2.98	Ambivalent	5
Promotion	14.37	2.85	Ambivalent	6
Contingent rewards	13.94	3.54	Ambivalent	7
Fringe benefits	12.69	4.11	Dissatisfied	8
Operating conditions	12.18	2.58	Dissatisfied	9
Total satisfaction	138.29	18.34	Ambivalent	

Table 4. Differences and correlation of independent variables to nurses' intent to stay

Variables	M	SD	T statistics	*p*-value
Intention to stay	2.97	0.58		
Age†			0.073	0.942
Younger	2.97	0.57		
Older	2.97	0.61		
Sex†			0.711	0.478
Female	2.94	0.50		
Male	3.03	0.73		
Number of Dependents‡			1.831	0.165
None	3.09	0.46		
1-2	2.89	0.64		
3 or more	2.87	0.71		
Civil Status†			0.440	0.661
Single	2.99	0.50		
Married	2.94	0.72		
Highest Educational Attainment†			1.893	0.061
Bachelor degree	2.95	0.57		
Master degree	3.45	0.76		
Monthly Salary†			2.078*	0.040
Lower	2.86	0.51		
Higher	3.08	0.63		
Type of Hospital†			2.472*	0.015
Private	2.84	0.52		
Public	3.10	0.62		
Nursing Function†			1.454	0.149
Staff	2.94	0.56		
Administrative/Supervisory	3.19	0.72		
Employment Status†			1.901	0.060
Contractual	3.12	0.52		
Regular	2.90	0.61		
Length of Service‡			1.213	0.308
Less than 24 months	2.87	0.50		
24 to 48 months	2.99	0.51		
48 to 72 months	2.96	0.77		
More than 72 months	3.19	0.50		
Area of Assignment‡			2.155	0.120
Nursing Service Office	3.25	0.58		
Ward/Private Rooms	3.02	0.47		
Specialty Units	2.88	0.66		
Satisfaction§			0.285*	0.002
Satisfied	3.11	0.58		
Ambivalent	2.97	0.48		
Dissatisfied	2.28	0.94		

†*t-test,* ‡*ANOVA,* §*Pearson's r,* **p<0.05*

4. Discussion

This study assessed hospital nurses' job satisfaction and intention to stay in their current workplace. This study found that more than half of the nurses were neither satisfied nor dissatisfied were their job. This finding is similar to the results among Jordanian nurses (Mrayyan, 2007) and Polish and Swedish nurses (Serafin et al., 2019). Nigerian nurses in public hospitals were also moderately satisfied with their work (Samson-Akpan et al., 2015). An average level of general job satisfaction was also found by Legaspi (2019) among Filipino nurses employed both locally and overseas. Our finding is however in contrast to the study of Dones et al. (2016), Devera and Maniago (2017), and Lapeña et al. (2017) among Filipino nurses and of Mohite et al. (2014) among Indian nurses where nurses were generally satisfied with their job and work environment. The variation in the results of studies may be due to the different measures used by the researchers to assess nurses' job satisfaction at the same time the variable like job satisfaction can change over time therefore results can be limited or potentially biased due to the cross-sectional design of studies conducted examining nurses' job satisfaction.

When studying nurses' job satisfaction, it is vital to critically examine the different domains or facets of the job to have a better understanding of their attitude towards their work. It is noteworthy that among the nine domains of job satisfaction, nurses in this study reported the highest satisfaction in terms of the nature of the job. Prior studies using the JSS similarly noted the nature of the work was the highest scored subscale of the JSS among Filipino nurses (Rosales et al., 2013) and Saudi nurses (Baker & Alshehri, 2020). Legaspi (2019) also found that "the chance for the nurses to do things for other people" or social service was motivating and satisfying for nurses. The satisfaction of Filipino nurses appears to come mainly from the work itself of being a nurse or the job task themselves. This may explain that despite the not ideal working conditions and not competitive pay for nurses in the country, Filipino nurses still find nursing a fulfilling and satisfying profession. On the other hand, nurses reported the lowest satisfaction in terms of the fringe benefits (monetary and non-monetary) and operating conditions or operating policies and procedures at work. Nurses were also dissatisfied with the fringe benefits and received the lowest mean score on this domain in the studies of Rosales et al. (2013) and Baker and Alshehri (2020).

It was also demonstrated in this study that a big majority of nurses were ambivalent about whether they will stay or not in their current workplace. It was also notable that only a few nurses intend to stay in their current job. A study conducted in Jordan found the nurses were also neutral in reporting their intention to stay at their current workplace (Mrayyan, 2005, 2007). Filipino nurses of a study conducted in the province of Samar were also undecided whether or not to leave their organization (Labrague et. al, 2018a). The result of this study is however in contrast to the findings of (Dones et al., 2016) that reported majority of Filipino nurses intend to remain in their present work environment. A significant proportion of the sample in the study of Dones et al. (2016) involved nurses from the academe while our sample included nurses working in the hospital setting. Also, the different research instruments used to assess the intention to stay in the present job could have influenced the results of the studies. For instance, the study of Dones et al. (2016) assessed intention to remain in their present job within the next six months while our study assessed nurses' intention to stay in their work for a longer period (e.g., retirement).

In this study, we also found that nurses in the public hospital and those nurses with higher salaries had higher intentions to stay. On the contrary, Jordanian nurses in the private hospital had a higher intention to retain their jobs compared to nurses in the public hospital (Mrayyan, 2005). It was also earlier found that nurses' intention to stay rates varied between those working in non-teaching and teaching hospitals (Mrayyan, 2007). Nonetheless, the result of this study is not an unexpected finding given that the salaries of Filipino nurses in the private hospitals are typically lower and not at par with the salaries of nurses working in the public hospitals. We tried to check and compare the monthly salary of nurses between the two hospitals in this study. The average monthly salary of nurses in the private hospital was only PHP 11,700.00 or 234 USD while the average monthly salary of nurses in the public hospital was PHP 23,400.00 or 468 USD and this was statistically significant (t=-14.711 p=0.000). While salary is one of the factors why Filipino nurses aboard like their job, locally-employed nurses are dissatisfied with their salary (Legaspi, 2019). Similarly, compensation and benefits received the lowest positive response and low salary or monetary compensation was a common reason for intending to leave their job in a survey conducted by Dones et al., (2016) among Filipino nurses. A study related that salary was an essential predictor driving Nigerian nurses (Akinwale & George, 2020) and Jordanian nurses'

(Al Momani, 2017) job satisfaction. While this finding in our study is not surprising anymore, our research provides empirical and up-to-date evidence regarding the disparity of salary between public and private hospitals in the country. To keep nurses in their position, the institution could intervene through satisfactory wages (McHugh & Ma, 2014). This study suggests that efforts should be made to gradually raise the salary of nurses, especially in the private sector to address the growing needs of nurses.

Finally, it was revealed in this study that nurses' job satisfaction was significantly related to their intention to stay in their job. Job satisfaction significantly contributes to nurses' intention to stay. The result is consistent with findings reported from studies conducted among nurses in Canada (Sourdif, 2004), China (Li et al., 2020; Wang et al., 2012), and South Ethiopia (Asegid et al. 2014). A review study also disclosed that job satisfaction was positively associated with the intention to stay in the organization (Al Zamel et al., 2020). Among Filipino nurses, it was likewise found that job satisfaction strongly predicted turnover intention (Labrague et al., 2018b). Moreover, the result of this study supports the Theory of Planned Behavior which states that attitude is considered a significant determinant of behavioral intention (Ajzen, 1991; Atencion et al., 2019; Ditching et al., 2020). In this study, nurses' attitude towards their job or job satisfaction is positively linked with their intention to stay in their current workplace. It may be necessary for policy-makers and hospital administrators to work on improving nurses' satisfaction to retain qualified and experienced nurses and put a stop to the brain drain of skilled professionals in the country.

5. Implications and limitations

Our result has important implications for policymakers and nursing administrators given the felt shortage of nurses in the country and across the globe. Efforts should be made to tip scale to the favorable side of job satisfaction. Increasing the job satisfaction of nurses can be a step aimed at improving the quality of services rendered to the patients. When nurses are satisfied with their job, they are better able to render quality nursing care. Also, steps must be made to prevent the high turnover rates of nurses and retain organizationally committed and experienced nurses. Policies and regulations of hospitals as well as the benefits of the nurses should be improved. These facets of the job of nurses along with those where nurses were ambivalent about such as contingent rewards, promotion, and pay should be given more attention.

This study bears certain limitations and these are as follows. This study is limited among nurses in two middle-level hospitals in the Philippines and our study failed to reach the desired sample given the constraints of the pandemic. Caution is warranted when generalizing and using the findings of this study. Additionally, the cross-sectional research design of our study cannot infer cause and effect among the study variables likewise it cannot track temporal changes hence results can be limited or potentially biased. There may be changes in the nurses' work satisfaction and turnover intentions during the current pandemic. Also, the use of self-administered questionnaires lends itself to self-reported bias and the possibility of social desirability. Despite the limitations, our study contributed to a better understanding of nurses' job satisfaction and intention to stay in the local setting.

6. Conclusion

Nurses are generally neither satisfied nor dissatisfied with their job however, it is vital to look into the different domains or aspects of the work when studying job satisfaction to better understand the sources of nurses' satisfaction, contentment, and fulfillment at work. Additionally, few nurses plan to stay in their current workplace. This study also affirms that the satisfaction of nurses about their job is positively linked with their intention to stay in their organization. The more the nurses are satisfied, the higher is their intention to stay. It is highlighted in this study that steps should be made in developing strategies to improve nurses' job satisfaction and to encourage nurses to remain in their current workplace. Paying attention to issues pertaining to nurses' job satisfaction, addressing nurses' needs, and increasing their salary along with the other facets of job satisfaction are focal points of action to ensure the adequate supply of nurses. The result of this study also calls for more attention to be given to increasing the salary of nurses particularly in the private sector to help halt the loss of skilled professionals in the country.

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Author contribution

All authors participated sufficiently in the concept, design, analysis, writing, or revision of the manuscript.

Conflict of interest

The authors declare no conflicts of interest.

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