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Effect of Life Review and Cognitive Therapy on Depression in Patients with Chronic Renal Failure

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Abstract

Patients with chronic renal failure suffer higher rates of depression because of psychological stress due to physical and social changes. Efforts to reduce depression level are needed. Cognitive therapy and life review therapy are believed to be effective in reducing depression. The aim of this study was to compare the effects of life review therapy alone and in combination with cognitive therapy on depression in patients with chronic renal failure. This study employed a quasi-experiment with a comparison group design. Fifty-six respondents were selected using a consecutive sampling, which thirty-six were assigned in the experiment and comparison group. Depression was measured using Beck Depression Inventory. Dependent and Independent t-test were used for data analyses. The results revealed that the combination of life review and cognitive therapy had a significant effect ($p<.05$) in reducing depression compared with the life review therapy alone. The average of depression score decreased in the experiment group from 27.04 (4.71) to 22.29 (4.24). But there was no significant change in the average of depression score in the comparison group from 26.54(4.18) to 26.71 (3.70). This therapy can be used as a complementary medicine to treat patients with chronic renal failure, specifically for those with depression, and it serves as a recommendation for nursing intervention in hemodialysis units.

Keywords: Chronic renal failure, cognitive therapy, depression, life review.

Introduction

Chronic Renal Failure (CRF) is a disease in which the function of kidney organ decreases until it is no longer able to work in filtering the remnants of the body's metabolism and the disposal of body electrolytes, as well as in maintaining fluid balance and body chemicals such as sodium and potassium in the blood or urine production (Vaidya & Aeddula, 2019). In some serious cases, CRF patients are advised or given hemodialysis. However, the state of dependence of the patients on the hemodialysis can result in changes in bio-psycho-socio-spiritual aspects, which most likely make the patients become weak and are unable to carry out activities as usual and helpless. As a consequence, they will be reluctant to meet with others, and withdraw from the social environment (Finnegan-John & Thomas, 2012; Gerogianni & Babatsikou, 2014).

Majority of CRF patients with hemodialysis suffer from depression (Shirazian et al., 2016). Depression is a form of natural disruption characterized by symptoms related to dysfunction of affect, emotions, thoughts and general activities. Depression also refers to a feeling of sadness and loss of interest in everything (Khan et al., 2019; Nur'aeni et al., 2019). Patients with depression generally exhibit distinctive psychological, physical and social symptoms, such as moodiness, prolonged sadness, sensitivity, irritability, loss of morale, lack of confidence, and decreased endurance (Khan et al., 2019; World Health Organization, 2020). Consequently, depression can exacerbate the effects of chronic disease and increase functional disability, make the act of dialysis no longer effective, and reduce the quality of life (Shirazian et al., 2016).

Based on our preliminary study with thirty CRF patients in one hospital in Indonesia, there were three people (10%) had severe depression, six (20%) with moderate-severe depression, five (16.7%) with mild-moderate depression, 10 (33.3%) with mild depression, and 6 (20%) were normal. This indicates that the majority of CRF patients experienced mild to severe depression, which need immediate treatments. According to literature, depressed patients can be treated in the form of psychosocial therapy, such as cognitive therapy, interpersonal therapy, behavioral therapy, psychotherapy and group therapy, and life review therapy (American Psychological Association, 2020; Cuijpers et al., 2019). In this study, the author used cognitive therapy and life review therapy to reduce depression in CRF patients.

According to Sriwattanakomen et al. (2010), cognitive therapy is a therapy that identifies or recognizes negative and destructive thoughts. The therapy can help stop negative thought patterns and change them into positive ones as well as finding out the causes and controlling them (Derubeis et al., 2019; Skoog, 2011). Cognitive therapy is a form of psychotherapy that can train patients to change the way patients interpret and view things when the patients experience disappointment, so they feel better and can act more productively. It is given individually with the expectation that they are able to have healthy thoughts that can form adaptive coping in solving problems (Hayati et al., 2018; Skoog, 2011; Young et al., 2014). Previous studies have shown that the cognitive therapy is significant in reducing depression (Tanaka et al., 2011; Young et al., 2014).

Life review therapy, according to Wheeler (2013), is a retrospective review of existence, critical learning from a life or seeing for a person's past life by reawaking a life event into a more positive life story. Yi and Qunzhan (2019) said that life review therapy is an intervention related to the achievement of Erickson's psychosocial life stages with eight individual psychosocial stages, which individuals struggle to balance life conflicts to achieve successful life stages. This therapy makes individuals know how well they are to manage conflict and give meaning in each stage of life by integrating experiences in the present and the future. The result of this integration is self-acceptance, strong self-identity and meaningful life (Yi & Qunzhan, 2019). The process of life review consists of 4 interrelated parts, namely remembering, recalling, reviewing and rebuilding memory (Orozco et al., 2014). Several studies have examined the effectiveness of this therapy and proved significant in reducing depression (Ando et al., 2014; Lamers et al., 2015; Latorre et al., 2015; Townsend, 2014).

Given the impacts of both therapies, it is assumed that the combination of those would be much more effective than one therapy only. Our review suggested there is no single study that has been conducted in both nationally and internationally in related to the combination of both cognitive and life review therapy. Therefore, the aim of this study was to determine the effect of the combination of cognitive and life review therapy compared with the life review therapy alone in reducing depression among CRF patients.

This study is significant for nursing science because depression in CRF patients is one of nursing problems that nurses should take care of. Nurses are not only focusing on physical condition of the patients, but also psychological, social and spiritual aspects of them. The findings of this study would be benefit for the nurses in the implementation of nursing intervention specifically in the hemodialysis units.

Method

This study employed a quasi-experimental research design with pretest and posttest with a comparison group. The population in this study was all patients with CRF undergoing hemodialysis at Raden Mattaher Jambi Hospital. The participants were selected using a consecutive sampling technique. The author chose this technique because the participants were only able to be reached in the hemodialysis units. Therefore, the participants who met the author during data collection were selected based on inclusion criteria until the required sample size was achieved. The inclusion criteria of the participants were: 1) patients with CRF undergoing hemodialysis therapy in hemodialysis units, 2) aged 18–65 years, 3) patients with moderate-severe depression, 4) not experiencing a decrease in consciousness, communicative and cooperative (5) general conditions and vital signs before, during and after hemodialysis therapy showed stable conditions. There were 56 participants included in this study, which 28 were assigned in an experiment group and a comparison group.

To avoid bias, the two groups were selected from different units, which indicated that both groups were totally different. The sample selection was done first for the experiment group. After all participants were fulfilled, the author then selected participants for the comparison group using a matching method according to the participants' characteristics including age, gender, working status, marital status, education, duration of illness, administration of antihypertensive drugs, and frequency of hemodialysis. The number of participants was calculated using G-power 3.1 analysis program (Faul et al., 2009) at effect size d .8, □ error probability .05, statistical test power .8, which resulted in a total sample of 52 as a minimum sample.

There were two instruments used in this study: 1) Instrument to collect demographic data, which consists of age, gender, working status, marital status, education, duration of illness, administration of antihypertensive drugs, and frequency of hemodialysis; 2) To measure depression, Beck Depression Inventory was used (Beck et al., 1988). The inventory consists of 21 questions. It is also available in the Indonesian version translated by Sakti (2009), with a validity and reliability of .748. However, for this study we also tested the validity with 30 respondents with r value of .514 greater than r table. The inventory uses Likert scale, which the type of negative questions (unfavorable) with a choice of answers that have a range of values from 0 to 3 were only known by the researchers. Depression is interpreted by adding up all the respondents' answers and analyzing the results, which is then classified into 4 categories: normal (0–9), mild depression (10–15), moderate depression (16–30), severe depression (> 30). The inventory was considered reliable using Cronbach's coefficient-alpha with a value of .710.

This study was conducted at Raden Mattaher Hospital in Jambi Indonesia for seven weeks, from April 21, 2017 to June 6, 2017. Data were collected by the researchers and assisted by four nurses in the hemodialysis units. Two nurses in the experiment group, and another two nurses in the comparison group. Prior to data collection, the author explained the research procedures to the nurses, and the author ensured that all nurses understood all processes. Pretest in each group was conducted right before the interventions were

begun, and posttest was done right after the interventions were completed. There was no break between interventions and pretest or posstest.

The experiment group received the combination of cognitive therapy and life review therapy, while the comparison group was only given life review therapy. There was no difference in life review therapy provided in both experiment and comparison groups. The time for cognitive therapy was completely different from life review therapy. The cognitive therapy was implemented first, then followed by the life review therapy. Each meeting was based on an agreement between the researchers and the respondents in consideration of the physical condition of the patients during hemodialysis therapy. The cognitive therapy consists of four sessions carried out in four to five meetings or patient visits to undergo hemodialysis therapy. One meeting was held for about 50 minutes in the hemodialysis unit. While life review therapy consisted of four sessions conducted for 25-30 minutes. This therapy was implemented every day in accordance with the agreed schedule. It was done in groups which were divided into four groups. Each group consisted of seven patients. The methods used in this therapy were discussion, question and answer, and instruction.

Descriptive statistics (mean, standard deviation) were used to describe demographic and depression data. As data were normally distributed, Dependent t-test was used to analyze the depression in each group before and after the intervention, and Independent t-test was used to analyze the difference in depression level after given intervention between the experiment group and the comparison group. The normality of the data was examined using Kolmogorov-Smirnov test with a result of .93 (>.05). Chi-square test was also used to examine the difference of the participants' characteristics between both groups.

This study was ethically approved by the Research Ethics Committee of Jambi University with approval number of 104 / UN18.5 / LT / 2017 on May 10, 2017. Prior to study, the author provided an explanation of the goals, processes and expectations of this study to all participants. Each participant was asked to sign an informed consent if they were willing to participate. Each participant was also given the full right to approve or refuse to join the study or withdraw at any time without any penalties. This study was conducted by upholding the ethical principles including autonomy, confidentiality, justice, honesty, non-maleficence.

Results

Characteristics of Participants

As shown in Table 1, most of the participants were male (32, or 57%), unemployed (41, or 73.2%), having higher educational background (46, or 82,1%), and married (47, or 83.9%). Of the total participants, 35 or 62.5% of the participants were given anti-hypertensive drugs. Chi-square test showed that there was no significant difference between the experiment group and the comparison group based on the characteristics of gender, working status, educational background, marital status and administration of anti-hypertensive drugs.

Table 2 shows that the average age of

Table 1 Characteristics of Participants According to Gender, Working Status, Educational Background, Marital Status, and Administration of Anti-Hypertension Drug

Characteristics	Experiment (n = 28)		Comparison (n = 28)		Total (n = 56)		p-value
	n	%	n	%	n	%	
Gender							
Male	16	57.1	16	57.1	32	57.1	1.000
Female	12	42.9	12	42.9	24	42.9	
Working Status							

Working	7	25	8	28.5	15	26.8	0.763
Not working	21	75	20	71.5	41	73.2	
Educational Background							
Elementary and Junior high	3	10.7	7	25	10	17.9	0.163
Senior high school and University level	25	89.3	21	75	46	82.1	
Marital Status							
Married	24	85.7	23	82.1	47	83.9	0.716
Not married	4	14.3	5	17.9	9	16.1	
Administration of Anti-Hypertension Drug							
Yes	19	67.9	16	57.1	35	62.5	0.408
No	9	32.1	12	42.9	21	37.5	

Table 2 Characteristics of Participants Based on Age, Duration of Illness, and Frequency of Hemodialysis

Characteristics	Group	Mean	SD	Min-Max	95%CI	t	P-Value
Age (year)		46.93	12.534	20–65	42.07–51.79	-1.094	0.279
Experiment		50.54	12.127	21–65	45.83–55.24		
Comparison							
Total		48.73	12.355	20–65	45.42–52.04		
Duration of Illness (month)		20.89	18.990	2–65	13.53 – 28.26	-0.785	0.436
Experiment		32.11	60.975	4–312	8.46 – 55.75		
Comparison							
Total		26.50	45.102	2–312	14.42 – 38.58		
Frequency of Hemodialysis		164.86	152.01	11–521	105.21 – 223.80	-0.726	0.471
Experiment		235.11	488.67	19–2496	45.62 – 424.60		
Comparison							
Total		199.98	360.32	11–2496	103.49 – 296.48		

Table 3 Level of Depression Before and After Given Intervention in the Experiment and Comparison Group

Group	Depression		Mean difference (SD)	t	p-value
	Pretest	Posttest			
	Mean (SD)	Mean (SD)			
Experiment	27.04 (4.71)	22.29 (4.24)	4.75 (.47)	8.820	<.001[a]
Comparison	26.54 (4.18)	26.71 (3.70)	-.17 (.35)	-0.708	0.485[a]
p-value	0.175[b]	0.001[b]			

[a]Dependent t-test | [b]Independent t-test

the participants was 48.73 years with the youngest age of 20 years and the oldest age of 65 years. The average length of illness was 26.50 months, and the average frequency of hemodialysis was 199.98 times. Based on the results of the independent t-test, there were no significant differences between the two groups based on the characteristics of age, duration of illness and frequency of hemodialysis (p> .05).

Level of Depression Before and After Given Intervention

Table 3 shows that there was no significant difference in the depression level during pretest (p =.175), which indicated that both groups had the same baseline data. Based on the Dependent-t-test, there was a significant difference in the level of depression in the experiment group before and after the intervention (p <.01). But there was no significant difference in the level of depression before and after the intervention in the comparison group (p =.485). Based on the results of the Independent t-test, there was a significant difference in the level of depression after the intervention between both groups, which indicated that the therapy in the experimental group was significantly effective at reducing depression level than the therapy in the comparison group (p =.001).

Discussion

Findings of this study revealed that the combination of cognitive and life review therapy had a significant effect in reducing depression level compared with the life review therapy alone. The significant effect of the combination of cognitive and life review therapy in the experimental group could be seen from the difference of the average of depression level between pretest and posttest, with mean of 4.75 and standard deviation of .47 (p <.01). Contrarily, the life review therapy alone in the comparison group did not provide any effects on depression level (p = .485); in fact, there was a slight increase of depression level from 26.54 to 26.71 as indicated in our study. This might be due to the negative feelings during and after life review therapy that might take time to heal among participants. Each participant might response differently after discussing their lives, which needs to be anticipated. This result however provides the new knowledge in alternative medicine and adult nursing.

Both therapies have different roles, which cognitive therapy focuses on identification of negative thoughts and their causes as well as controlling them to be positive (Derubeis et al., 2019; Skoog, 2011), while life review therapy focuses on changing the negative feelings by acceptance, restoration of self, and resolution of grief (Yi & Qunzhan, 2019). Thus, the combination of both are effective in reducing depression, as indicated in our study.

In addition, this result was in line with the theory outlined by Townsend (2015) who said that the process of implementing cognitive therapy and life experience review therapy is a therapy that is oriented towards the goal of solving patient problems. At the beginning of the meeting, the therapist must identify the problems facing the patient. Then together set goals and expected results in therapy. The process of discussion in solving problems faced by patients is needed when patients begin to recognize cognitive distortion and improve their thinking patterns.

Our results also indicated that the life review therapy alone had no significant effect on depression. This result against the findings from previous studies revealed that there was a significant effect of the single life review therapy on depression (Ando et al., 2014; Lamers et al., 2015; Latorre et al., 2015; Townsend, 2014). According to our study, the life review therapy will be effective if combined with cognitive therapy.

Our study has implications in nursing practice specifically in Indonesia. Most of nursing services especially in the hemodialysis units rarely address the psychosocial aspects of their patients. This can be seen from the format of nursing assessment that only covers physical aspects before, during and after the implementation of hemodialysis therapy. The results of our study suggest that the hemodialysis units should add one assessment dimension, namely the psychosocial aspect of the

patients along with the action plan in the form of nursing care standards. In addition, mental health services in the hemodialysis units can be developed with the intervention of mental nursing in CRF patients who undergo routine hemodialysis therapy. Additionally, this study also suggests that the roles of mental health nurses in the hemodialysis units are necessary in reducing depression of CRF patients, and the combination of cognitive and life review therapy serves as an input for nursing intervention in the units.

The limitation of this study might include the implementation of the interventions which varied among participants dependent on the physical condition of each participant after hemodialysis. Some participants might be strong enough to join, some might not, which might influence the outcomes of the findings. However, the use of the comparison group in this study might reduce the bias. In addition, the time for data collection, specifically for posttest might need little bit more time to adjust the feelings of each individual after the life review therapy. Future studies may need to focus on this factor for consideration. In addition, the results of this study were also limited to chronic renal failure patients undergoing hemodialysis therapy in one hospital which may not be generalized. However, this research can be a reference for conducting research in the same area. To understand depression in patients, different research methods, such as cohort or qualitative study need to be done. Also, to determine the effect of cognitive therapy alone is needed for comparison.

Conclusion

It is concluded that the combination of life review and cognitive therapy was significantly effective in reducing depression. Therefore, this therapy is recommended as a part of nursing interventions particularly for the treatment of depression among the patients with chronic renal failure undergoing hemodialysis. The use of life review and cognitive therapy as the additional components of the medical treatment will reflect such a holistic care for the patients in hemodialysis units.

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The Relationship between Self-Efficacy and Subjective Well Being among Tobacco Farmers

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Abstract

Tobacco is the main raw material for cigarette production, so it is a dilemma for farmers when choosing to plant it. Uncertain weather in Indonesia has an impact on the success of tobacco cultivation. This study aimed to analyze the relationship between self-efficacy and subjective well being in tobacco farmers in Jember Regency. This study used a cross sectional design with a proportional random sampling technique with a sample size of 422 tobacco farmers. The research instrument used the General Scale Efficacy questionnaire (α-Cronbach 0.76-0.9), Scale with Life Satisfaction (α-Cronbach 0.87), and Scale of Positive and Negative Experience (α-Cronbach 0.80-0, 84). This study uses Chi Square (CI = 95%). The results showed there was a relationship between self-efficacy and subjective well being in tobacco farmers (p = 0.000; OR = 4.856). The results of this study are tobacco farmers who have self-efficacy can face crop failure, and this is because of the experience of working as a tobacco farmer, which shows that tobacco farmers worked on average for 23 years with experience of crop failure as much as three times. If farmers have more experience, they can know the weaknesses and strengths of tobacco farming to overcome the problems in the scope of tobacco cultivation. Increased work experience, the farmer is getting bolder in making decisions and dare to bear the risk. This study are expected to help the public health office at the Primary Health Care Service to improve psychosocial health promotion efforts through a joint farmer group.

Keywords: Self efficacy, subjective well being, tobacco farmer.

Introduction

Every job has problems that will impact the work, including tobacco farmers as well. The uncertain weather in Indonesia (Herminingsih, 2014), cheap tobacco selling price (Santoso et al., 2017) and the presence of the WHO (World Health Organization) to reduce smoking behavior and cigarette tobacco production (WHO, 2018) and the competition activities of anti-tobacco or cigarette campaigns (Ematia et al., 2012) is a vulnerability to farmer work stress. According to the research of Santoso et al. (2017) explained that farmers are still confused to manage tobacco results so that farmers are forced to sell their crop to the pressing of tobacco with a cheap selling price. It is undoubtedly detrimental to tobacco farmers. Farmers experiencing working stress will have an impact on declining health conditions due to high workloads. Therefore, it is crucial to know the psychological health as supporting welfare and increased productivity (Susanto et al., 2015).

Based on the results of the study of Septiani (2019) showed that tobacco farmers in Kalisat sub-district experience a key symptom including a sad feeling (68.1%) and loss of interest in any matter (59.3%). Tobacco farmers complained of stress due to irregular weather changes causing the crop to fail. Based on a qualitative study conducted by Susanto and Widayati (2018), farmers revealed that when the crop fails, it can have an impact on sleep quality and irritability. Farmers feel they have spent cost and expensed a lot of energy for tobacco planting. An irritable feeling is an indicator of the high negative emotions of subjective well-being. Besides, there is dissatisfaction due to an unpleasant crop failure experience also included in the subjective well-being. Farmers who have the satisfaction of their lives can control emotions and moods well. Diener et al., (1999) explains this individual happiness called the subjective well-being concept. Based on some research that has been explained, farmers have not been able to properly manage their emotions while facing tobacco farming problems. It can have an effect on subjective well-being on the farmer's self.

In the research of Yamin (2019) explain farmers often feel anxious and worried when conducting business in the field of agriculture such as ease to obtain the means of production of crops as desired, the occurrence of failed harvest flood, the presence of pests and diseases and the selling price of crops. In addition to the problems in tobacco farming, the problem related to the economy also affects the emotional condition of tobacco farmers (Septiani, 2019). Poor psychological conditions will result in a reduced sense of delight, comfort, and can reduce one's productivity.

In the problem mentioned above, tobacco farmers in the district Kalisat Jember District have an unstable emotional experience that is an indicator of subjective well being due to various problems during the planting of tobacco. Based on the above background, researchers to determine the level of self-efficacy with subjective well being in tobacco farmers in Kalisat District, Jember Regency.

Method

Design research used observational analytic using a cross-sectional approach. The research samples are tobacco farmers who are incorporated in the farmer group in 12 villages in Kalisat subdistrict. The criteria of inclusion of research subjects include farmers as farm laborers, working only as tobacco farmers (during the tobacco planting season), aged 35–60 years (based on Diener's theory), already married, living with the family, have never experienced crop failure. The sampling technique uses proportionate random sampling, a large sample of 422 respondents taken using the Slovin formula.

The instruments used by the General Scale Efficacy. Questionnaire have ten statements with level indicators, strength, and generality. The Questionnaire was examined by Ralf Schwarzer and Matthias Jerusalem with the Alpha range of Cronbach 0.76-0.9 (Born, Schwarzer & Jerusalem, 1995). The measurement subjective well being with affective and cognitive indicators using two questionnaires, namely Scale with Life Satisfaction (α-Cronbach 0.87) developed by Diener, Larsen, Emmons & Griffin (1985).

A questionnaire for the Scale of Positive and Negative Experience (α-Cronbach 0.80-0.84) was scaled from Diener et al. (2009). This scale is a Likert scale that presents six lists of positive emotions, six lists of negative emotions. The statistical test used was Chi-Square (CI = 95%). It is given the ethics commission of the Medical Research (KEPK) Faculty of the Dentistry University of Jember with the test number No. 684/UN 25.8/KEPK/DL/2019.

Results

Table 1 A characteristic description of tobacco farmer respondents in Jember district

Variable	N	(%)
Age (median; min-max)	47	35–60 year
length of working (median; min-max)	23	2–49 year
The Experience of failed harvest (median; min-max)	3	0–15 time
Income (Rupiah) (median; min-max)	1000000	500000–2000000
Gender		
Male	317	75.1
Female	105	24.9
Education Level		
Elementary School	228	54.1
Junior High School	113	26.8
Senior High School	81	19.2

Source: Primary Data researcher, January 2020

Table 2 Frequency of respondents in variable subjective well being

Indicator	Median	Min-Max
Subjective Well Being	35	3–57
Affective: Life Satisfaction	26	12–33
Cognitive: Emotional Experience	9	(-8)–32

Source: Primary Data researcher, January 2020

Table 3 Distribution of respondents in variable subjective well being

Variable	Amount	Percentage
Subjective Well Being		
High	265	62.8
Moderate	157	37.2
Low	0	0
Total	422	100.0

Source: Primary Data researcher, January 2020

This study illustrates the demographic characteristics of tobacco farmers, subjective well-being, self-efficacy, and the relationship between self-efficacy and subjective well-being of tobacco farmers.

Demographic characteristics of tobacco farmers as follows (table. 1)

Subjective Well Being of Tobacco Farmers

The depiction of subjective well being on tobacco farmer's Jember District includes life satisfaction and emotional experiences over the last four weeks (table 2).

Based on table 2. It indicates that the median value gained in the subjective well-being variable is 35, which means tobacco farmers have high subjective well being. The median value of life satisfaction is 26, which means the average tobacco farmer is satisfied with his life, and an emotional experience indicator shows a median value of 9, which means tobacco farmers have a highly balanced emotional experience between positive and negative emotions.

Self-efficacy of Tobacco Farmers

An overview of the self-efficacy of tobacco farmers Jember District includes levels (relating to the level of difficulty experienced by individuals), strength (referring to the experience of the individual) and generality (relating to how broadly the task field is determined).

Table 4 Frequency of respondents to self-efficacy variables

Indicator	Median	Min-Max
Self-efficacy	32	21–40
Level	9	5–12
Strenght	10	6–12
Generality	12.50	8–16

Source: Primary Data researcher, January 2020

Tabel 5 Distribution of respondents in variable subjective well being

Variable	Amount	Percentage
Self-efficacy		
High Self Efficacy	281	66.6
Moderate Self Efficacy	141	33.4
Low Self Efficacy	0	0
Total	422	100.0

Source: Primary Data researcher, January 2020

Table 6 Relation to self-efficacy with Subjective Well Being farmer Tobacco

Self Efficacy	Subjective Well Being			p Value	OR
	High	Medium	Total		
High	211 (75.1)	70 (24.9)	281	0.000	4.856
Medium	54 (38.3)	87 (61.7)	141		
Total	256	157	422		

Based on table 4 it indicates that tobacco farmers have high self-efficacy with a median value of 32. The scoring mentions that the higher the score shows, the higher the self-efficiency, the lower the score under 21 indicates low self-efficacy. The minimum score of research is 21, so it can be said that no tobacco farmer has no low self-efficacy. The generality indicator obtains the highest median value of 12.50, while the level indicator acquires the lowest median value of 9.

The results showed a link between the self-efficacy with subjective well being on tobacco farmers ($p = 0.000$; OR = 4.856). Tobacco farmers have a high self-efficacy then will have a chance of 4 to five times having a high subjective well being.

Discussion

Subjective Well Being of Tobacco Farmers

Subjective well being interpreted as life evaluation with the indicator is life satisfaction and emotional experience. The results of this research show that tobacco farmers have high subjective well being. The results of this study supported the previous research on the characteristic relationship of farmers with the well-being of rice farmers conducted by Yamin et al. (2018) in Palembang, which showed that subjective well-being farmers gained an average high overall score. This research differs from the research conducted by Sukowati (2019) about the relationship between positive thinking and subjective well-being on farmers, where the research explains that the level of subjective well-being is relatively low, which means the satisfaction of his life is lacking. The difference of opinion with Sukowati (2019) is due to the rise of the selling price of crops that make farmers can only be resigned to the government to stabilize the price of crops. The low selling price affects the income that farmers have earned to meet the needs of the family.

Several factors can affect the level of subjective well-being of tobacco farmers, both on the indicators of life satisfaction and emotional experiences such as age, education, income, great work, failed harvest experience, marital status, and social support. Among these factors that have the most considerable influence is income because it is related to the fulfillment of family needs. Lucas et al., (2007) explained that there is a relationship between income and subjective well being. Good financial condition will provide a good life for individuals.

Self-efficacy of Tobacco Farmers

The results of self-efficacy research show that tobacco farmers in Jember district have high self-efficacy with a median value of 32 which is in the range 31-40. The results of this study were by previous research discussing the efficacy of self-associated with stress on tobacco farmers, in which individuals have self-efficacy in high category (Andriyani, 2019). Other studies that are consistent with this study are Puspita et al. (2019) which discusses the factors that influence the safety behavior of tobacco farmers, one of them self-efficacy shows that 66.7% of tobacco farmers have high self-efficacy. The study's results differed with the study discussing the relationship of self-efficacy with the use of Personal protective equipment (PPE) in farmers, where the research shows that farmers have a low category (Aji, 2015).

Self-efficacy has several indicators, such as levels, strength, and generality. The results of this research are known that tobacco farmers in Jember district have an indicator that shows the highest average value of the generality indicator. The generality indicator relates to the specified task field, how broadly with the abilities and beliefs possessed in completing the task (Bandura, 1997).

The strength indicator relates to the experience possessed by the individual. The increasingly long experience will increase the power of confidence and firmness in striving. This indicator can support the individual to encounter difficulties (Aji, 2018). Researchers argue several factors can influence the efficacy of self on indicator strength among others age, length of work over 23 years, experience failed to harvest. It can support farmers to create strength and confidence.

The results of self-efficacy research on the level indicators show the lowest average score. Level indicators relate to the level

of difficulty experienced by individuals. Different levels of individual stress will determine the ability to resolve the problem (Aji, 2015). Researchers argue that the educational factor is a significant factor in the level indicators. This indicator occupies the lowest value, so it needs to be improved in the required knowledge at the level of difficulty experienced. Knowledge enhancement can be done through educational activities or counseling in farmer groups.

Individuals have high self-efficacy so the individual is able to control the events and actions taken will be more effective because it can affect the mind, motivate and affect one's physical health when acting (Stuart, 2013).

Relation to self-efficacy with Subjective Well Being farmer Tobacco

This research showed there is a significant relationship between self-efficacy and subjective well-being on tobacco farmers in Jember District. It stated that people who have low self-efficacy would be at risk 4 to 5 times have a low level of subjective well being.

The research is in line with research conducted by Maujean and Davis (2013), which suggests that high individual self-efficacy can increase the individual's positive feelings and provide a positive relationship with life satisfaction. The study supported previous research conducted by Pramudita and Wiwien (2015) explaining that there was a connection between self-efficacy and subjective well being with a P-value of 0.000 and its correlate value of 0.341. The other studies explained that there is a positive relationship between self-efficacy and subjective well-being (Agustina and Afriyeni, 2016; Dearly & Sri, 2016). However, this study differed with the research of the Situmorang (2017), which examines the subjective well-being of the leader's contemplation reviewed from the role of optimism and self-efficacy, indicating that there is no correlation at all ($p = 0.135$ and $r = 0.486$).

Diener et al. (2009) Explaining someone is said to have a high subjective well when the individual has a life satisfaction, always feels joyful, and rarely feels negative emotions such as sadness, anger, despair, etc. Individuals with high subjective well-being will feel more confident, friendly, and socially bonding, and can demonstrate better work performance.

Self-efficacy is the main source of the coping in the context of personal beliefs that can be used as an ability to organize and implement the set of actions needed to produce something that is wanted to be achieved, and It will ultimately provide life satisfaction an indicator of subjective well being. A person with high self-efficacy can see things positively, dare to face challenges, perform tough tasks, and consider problems as something to be solved rather than a threat to avoid (Ariyanto, 2016).

Individuals who have high self-efficacy can cope with deep pressure in life. In this research, tobacco farmers who have high self-efficacy capable of facing problems in the planting period of tobacco; this is because the experience of working as a tobacco farmer is shown that tobacco farmers work on average for 23 years. Work experience is required in tobacco farming activities that serve to take the opportunity of tobacco farmers to improve the optimal tobacco yield (Sari, 2017). If farmers have more experience, they can know the weakness and advantages of tobacco farming to overcome problems in the sphere of tobacco cultivation. According to Herminingsih (2014), Increasing work experience makes farmers increasingly brave in making decisions and dare to bear the risk. Knowledge of farming can indirectly affect a farmer's mindset. Farmers who have a long experience in the field of tobacco farming can plan and conduct better farming efforts due to understanding in all aspects of tobacco farming (Ariyanto, 2016).

Tobacco farmers who can plan and perform the actions needed to produce something that they want to achieve will ultimately give life satisfaction. Individuals who have high self-efficacies can see things positively, dare to face challenges, perform tough tasks, and consider problems to be solved rather than a threat to avoid. It will help the individual to evaluate his life thoroughly so that he is subjective well being. When individuals have low self-efficacy will be prone to depression, anxiety, and despair for fear of facing

challenges and fear of failure in tobacco farming efforts (Rachmah, 2017).

Conclusion

There is a correlation between self-efficacies and subjective well-being on tobacco farmers in Kalisat district of Jember District. Tobacco farmers have a high self-efficacy then will have a chance of four to five times having a high subjective well being. This research aims to help Nurse improve psychosocial health promotive efforts through the combined farmer group. Farmers are expected to create high self-efficacy in the level indicators by increasing knowledge. In contrast, the family and social environment are expected to provide support and good attention so that the high subjective well being can be achieved.

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Exploring of Nurses' Needs of New Design Intravenous System Device to Support Nursing Care Effectively

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Abstract

Fluid control is important to support the success of therapy in the hospital. The existing features of the device currently do not fully support to ease the work of nurses. It is necessary to explore deeply the nurse's need for the features of a new device intravenous system. The purpose of this study was to explore the nurse's need for new design intravenous system devices to support nursing care effectively This was a qualitative study with thematic analysis methods. The participants were 20 nurses in Gotong Royong Hospital Surabaya taken by purposive sampling method. Data were collected by an in-depth interview. The instrument consists of structured questions. The interviews were recorded by a digital recorder. Ethical requirements are completed before data collection. This study found 4 themes consist of the economical price, multi-automatically system, flexible design, and simplicity. The nurse's needs for a new design intravenous system device was designed more economical than today's sophisticated device, and have more complete of automatic system, flexible and easy to use. These features match the needs expected by nurses and further assist in carrying out the nursing care process effectively and efficiently.

Keywords: Automatically, device, economical, intravenous system, nursing care.

Introduction

Giving intravenous fluid therapy is a collaborative action between nurses and physicians. It is an important part of the nursing care plan because the management of fluid therapy has to administer appropriately. The infusion pump was an effective device to provide fluid, blood, and treatment to patients, it contributed to improving the quality of patient care because of the greater level and accuracy to reduce medication errors (Padmaja & Kalgal, 2013). If it could not running well, it causes a variety of adverse side effects to patients. Currently there are many medical devices to control intravenous fluids automatically, but these tools do not fully feature to help ease the work of nurses and each error often in its implementation. A study stated that even the automatic infusion pump program, there was still a large portion of programming that was done manually (Scott Evans et al., 2010). Another study stated that nurses made mistakes in administering drugs through smart pump infusions (58%), this was because the pump programming still used manual mathematical calculations performed by nurses (Trbovich et al., 2010). This was more complicated and can cause high risk of errors when the workload of nurses was high in every shift. Previous studies declared that 105 nurses at Nishtar Medical College and Multan Hospital in Pakistan experienced nurses' workload performance with high average consumption time in the implementation of nursing care activities in the morning shift (57.10%) and evening (52.1%), this is higher than the night shift that only has an average consumption time with non-nursing activities (Safdar et al., 2019).

A study of 634 patients with intravenous drug and infusion therapy found an error rate of 1.4 times. It showed that the human error towards therapeutic programming conducted by high health workers such as nurses (Morales-González & Galiano Gálvez, 2017). In a study to 40 nurses in charge of administering intravenous fluid therapy in an adult intensive care unit, several errors were found such as errors in the setting and programming of primary continuous intravenous infusion, errors in identifying veins for infusion therapy, flush rate errors after intravenous injection, errors in preparing secondary intravenous infusions, and errors in administering intravenous pump boluses (Pinkney et al., 2014). Another study reported that failure to use an intravenous smart pump in reducing intravenous medication error, due to inappropriate features (Nuckols et al., 2008).

Expensive costs are one of the problems that cause hospitals to only have a limited supply of smart pumps. A study stated that for the average patient's utility costs, continuous infusion pumps have a total cost of € 199,296 (Quitian et al., 2015). The operational costs of managing and maintaining the use of infusion pumps have very high costs, therefore most of the infusion pumps in hospitals are in storage and are rarely exchanged between departments, the maintenance process is not monitored so it is not clear whether the current level of care meets the infusion pump maintenance regulations or not (Kemper et al., 2009). Most hospitals only use infusion control devices in certain units such as the intensive care unit (ICU). Several studies stated that research on smart pumps was carried out in the ICU because the majority of the use of these devices is only done in critical units (Giuliano, 2018; Manrique-Rodríguez et al., 2013).

In previous study on intravenous therapy, it was stated that the technology used demands additional cognitive abilities from doctors and nurses, causing failure in the use of tools and obstacles that arise in the device are not easily detected (Cassano-Piché et al., 2012). A study of smart intravenous pumps implemented in academic hospitals stated that initially the use of only a few nurses had positive acceptance of the smart intravenous pump technology, and that over time there was no significant increase in nurse's acceptance (Carayon et al., 2010). This proves that the creation of new design devices that are not based on the needs of nurses will be able to cause a mismatch of features in the device. When will design a more effective device, further exploration is needed about the features of the device to facilitate the work of nurses. Almost all of the previous studies that have been described above do trials to health workers on the effectiveness

of infusion pump devices that are designed with a variety of technologies, but there was no research that explores further what exactly was needed by health workers, especially nurses on technology, a new device about smart infusion pump.

The purpose of this study was to explore the nurse's need for new design intravenous system devices to support effective nursing care effectively.

Method

This study was a qualitative study used COREQ guideline to hold the research, with thematic analysis method. This method was used to obtain descriptions from participants by identifying patterns and finding themes through collected data.

The populations were 25 nurses in Gotong Royong Hospital Surabaya, to be able to provide a realistic description of the nurse's need for a new design of intravenous system device with expected features. Samples were selected from the population used purposive sampling through inclusion criteria consist of 1) nurses who had work experience at least 1 year, 2) nurses who had the minimum educational background was a diploma, 3) nurses who have done installation and monitoring of infusion more than 5 times, 4) nurses who have ever operated a manual infusion installation and automatic infusion pump. Nurses who appropriate with the inclusion criteria then approached by the researcher by explaining the objectives, benefits, and research procedures, and freedom of participation in this research. Nurses who were willing to be respondents then asked to sign an informed consent sheet as a form of consent. The sample size was 20 nurses based on inclusion criteria. Some 5 nurses were taken out as respondents because they just worked for less than 1 year.

Data were collected by an in-depth interview. The interview process did by the researcher. The researcher is female and worked as a lecturer and the researcher's relationship with the respondents before the research was conducted was a working relationship. This hospital is one of the hospitals which is used as a place for student practices area where researchers work and researcher as an academic preceptor in this hospital. The interviews were conducted in the nursing room, only the researcher and one nurse in this room and interview process recorded by a digital recorder. Researchers asked some questions to respondents based on structured question guidelines made by researchers, and respondents provide open answers. Each interview process lasted on average of 20 minutes and the researcher didn't make interruption during the interview process.

After the interview results were recorded, then it was transcribed verbatim by researchers and typed in Microsoft Word. The next step researcher did the coding process. The coding process method used was in vivo code that was the researcher wrote the code by the words used by participants. After all the code was completed, then continue to be evaluated again to find the code relevant to the research. When all the data has been coded, the codes that have the same meaning were made into groups. After that researcher selected the theme, the researcher reviews all the codes and groups that have been formed to ensure that the codes within each group have the same meaning. Groups that have a common meaning are collected into a theme. The last stage was to determine the conclusions/ verification of analysis results.

Ethics Approval and Consent to Respondents

This study has been carried out the ethical tests conducted by medical faculty of Widya Mandala Catholic University and stated ethical. Explanation of the research procedures, purposes, advantages, and risk-informed to participants and signing the informed consent who agreed as participants.

Results

Table 1 Demographic Characteristic

Demographic Data	Result
Age, year (mean + SD)	30 + 6.3

Gender	
Female	19 (95%)
Male	1 (5%)
Length of working	
1 – 3 years	8 (40%)
4 – 6 years	8 (40%)
More than 6 years	4 (20%)

Table 2 Main Themes and Categories

Themes	Category
1. Economical Price	Economical price for patients
	Economical price for hospitals
2. Multi-Automatically System	Stops automatically
	Monitoring remaining intravenous fluids automatically
	Drops calculate automatically
	Alarm system automatically
	Internet monitoring
3. Flexible design	Flexible for mobility
4. Simplicity	Easy to use

Table 3 Participant's narratives

Themes/ Category	Participant's Narratives
Theme 1: Economical price	
Category	
Economical price for patients	Participant 4 said: "Other devices could not be used for patients with poor economic status, because of expensive hire costs, this new device should be cheaper to be used for all patients who receiving intravenous therapy with various economic status"
Economical price for hospitals	Participant 7 said: "This device should be marketed at an affordable price to be purchased by the manager of a hospital to the hospital has a lot of stock that could be used by all patients"
Theme 2: Multi-Automatically System	
Category	
Stops automatically	All participants expected that the device could stop automatically when the intravenous fluid runs out, to prevent air embolism.
Monitoring remaining intravenous fluids automatically	Participant 12 said: "During this time, nurses check the remaining fluid manually by looking at the infusion bottle, but the new device is expected to be monitored through the screen on the device"

Drops calculate automatically	Participant 3 said: "To facilitate the work of nurses, so the new device must be able to automatically count the drip like an existing infusion pump"
Alarm system	All participants expected that the device equipped with an alarm system to be able to detect if the infusion fluid runs out or when there are an infusion flow obstacles, to that nurses could easily take immediate action to overcome it
Internet monitoring	Participant 12 said: This new device should be able to monitor the intravenous fluids at the nurse station through the internet network
Theme 3: Flexible design	
Category	
Flexible for mobility	Participant 1 said: "This device should be flexible and can be used by patients who have started learning wheelchair mobilization" Participant 16 said: "This device must have a quality battery so that if the light turn of or when the patient delivered to the radiology room/ physiotherapy room it can still be used without electricity"
Theme 4: Simplicity	
Category	
Easy to use	Participant 13 said: "The device must be easily operated by new nurses without special training" Participant 8 said: "The device must be designed in a sophisticated yet simple way to operate"

Discussion

To create a new design intravenous system device, it was needed input from nurses about the various features expected. Based on the results in table 3 found that participants asked the economical price of the eco-smart intravenous device, they expected the device to be designed with quality materials but the selling price can be affordable to be programmed in patients and to be invested by hospitals. Currently the use of intravenous pumps has only been provided to patients who have special problems such as patients in the Intensive Care Unit. Even though in the inpatient ward the use of infusion pumps should also be done to improve patient safety. But in reality in the inpatient ward is never done because the cost of hiring the device to be paid by patients is very expensive, besides the sale price of the equipment is also expensive which causes the hospital does not have enough funds to provide infusion pump equipment in large quantities. A study stated that hospital financial resources are limited, it causing hospitals cannot be able to provide infusion pumps that have an automatic ability to calculate drugs and infusion rates, so as an alternative solution a simple formula is needed to calculate infusion droplets to prevent error rates (Wright, 2007). The use of smart pumps can reduce annual expenditure and it proved to be an alternative with lower costs compared to conventional infusion systems, this allows for savings, especially in services in the ICU (Palacios Rosas et al., 2019).

The result in table 3 also found that the majority of participants expected that the new design of the intravenous system device can be designed to stop automatically. A

study stated that the infusion pump must have the ability to stop the infusion fluid that runs out automatically (Doesburg et al., 2017). Other nurses in this study expected that the new design of the device also to be able to monitor the remaining intravenous fluid automatically through the screen of the device. A study explained that the infusion rate was adjusted to the flow rate needed with the help of display on accuflow. The flow rate as shown by the accuflow display is checked every 15 minutes until the end of one hour, simultaneous notes from the manual reading are also made (Shroff et al., 2007).

Drops calculate automatically was also one of the features expected by nurses. A prior study reported that manually calculating infusion drops often causes errors and failure in the programming of infusion fluid therapy to patients. A case study conducted at a large hospital obtained data that the lack of confidence level of nurses in performing mathematical calculations manually related to the calculation of infusion droplets (Lee, 2008). One of the most common nurse mistakes is an error in calculating the dose of the drug and the rate of drip solution (Toney-Butler & Wilcox, 2019).

The most participant in this study expected that the design of a new device intravenous system used an alarm to monitor any trouble effectively. From the nurse's point of view, alarm sounds from a device signify something wrong about the patient's condition and it needs to be followed up clinically so that the potential for detecting problems and improving better care increase (Cosper et al., 2017). The findings on this study contradicted the results of other studies which stated that the majority of nurses agree that infusion pump alarms interfere with patient care, but perceptions about these alarms are indeed different, so it is not appropriate to apply broadly the general alarm management recommendations for infusion pump alarms to this time (Vitoux et al., 2018). A study reports that alarms on infusion pumps arise because there is no flow or excess flow, slow flow, blocked intravenous lines (Shroff et al., 2007). To make the alarm effective for a device, it should refer to World Health Organization (WHO) regulations which recommend that hospital sound levels should not exceed 30 decibels (dB) for continuous noise and 40 dB (for maximum sound). At the ICU patients who need constant monitoring and by using technological advances, the measured noise level exceeds WHO 40 dB standards and peaks at 45 dB, even during curfews when patients need rest (Ryan et al., 2016). An alarm at the infusion pump can be meaningful because it encourages timely responses from service providers or nurses, but the presence of an alarm can also cause problems such as noise because patients need a calm and peaceful environment to be able to rest (Graham & Cvach, 2010). Therefore we need a tool that has a warning alarm but also does not provide significant problems with noise.

Internet monitoring was a feature expected by nurses in the results of this study. So far no infusion pump can be monitored by nurses directly at the nurse station through internet network. A study conducted an internet-connected monitoring platform for IV infusion space, this device allows doctors and nursing staff to monitor the drip parameters wirelessly. The monitored data is transmitted to commercial cloud services using the HyperText Transfer Protocol Application Programming Interface. This data is saved and visualized for ease of readability for nurses and doctors (Sardana et al., 2019). Another study learned about the intravenous infusion system with automatic control, the sensor unit is designed to interact with a centralized server so that data can be uploaded directly to the cloud so that it can be easily accessed by end-users such as medicine, patient relatives (Kumar et al., 2020)

This study also found that nurses expected the new design of the intravenous system device to be flexible for a patient who was mobilizing in wheelchairs, or when a patient was being delivered to other units for treatment. It means that the device must be practical and easy to carry. This was contrary to the design of other smart pump devices which a form was not possible to carry anywhere and the patient feels uncomfortable on the indicators of position, lighting, noise, circulation, and shape (Arimbawa & Nugraha, 2018). One study assessed flexibility from another perspective that was a disposable infusion pump with characteristics that are

lightweight, small in size, easy to use, free of external power supplies, and disposable, but there are disadvantages namely the possibility of inaccurate flow rates, lack of facilities to change the flow rate and volume of bolus doses to provide analgesia which provides inadequacy, the inability to track a patient's history of analgesia requests (Skryabina & Dunn, 2006). Portable electronic infusion pumps are widely used by using a power source from the battery to power the pumping mechanism of the liquid that is connected to the infusion solution reservoir, but the accuracy of the infusion flow rate ranges from 5–8% (Oliver, 2016).

This study also found that nurses expected the new design of the intravenous system device will be easy to use for all nurses. Tools or device that were easy to use can trigger job satisfaction of nurses. This was consistent with a study which stated that one indicator of nurse job satisfaction was working conditions, namely the presence of adequate work equipment (Patrisia et al., 2018). It was supported by another study that Smart Pump Technology ambulatory can be implemented successfully in a Home Infusion Provider in small urban and rural areas. The user states that the pump is easy to use and the potential for patient safety increases. This study also shows that Smart Pump Technology can be used effectively by patients with high levels of satisfaction (Brown et al., 2018). Sometimes the use of smart pumps iv requires a little complicated programming method, so in fact, some strategies used by nurses working in busy and emergency areas are reluctant to use them because they are considered to be time-consuming, so nurses will program them manually even with alarm devices very undesirable because it makes the room noisier and increases psychological stress (McAlearney et al., 2007). A finding shows that smart pumps that are programmed by nurses require a mathematical conversion of a low secondary infusion success rate (55.6%), so that smart pump infusion does not have a significant effect in preventing dosage errors unless smart pumps are programmed hard that cannot be changed, they can prevent dosage errors, thereby increasing patient safety (Trbovich et al., 2010). Nurses have a responsibility for collaborative actions to provide the intravenous fluid therapy, but the problem faced by nurses in conducting proper fluid therapy management is the lack of training in therapeutic management, therefore that infusion pumps are considered as the technological resources that most contribute to patient safety (Moreira et al., 2017). This is similar to the results of the previous study, which states that nurses receive positively the efficiency of the application of smart pumps intravenous although some performance of the device is considered still less effective (Carayon et al., 2010).

In this study there was a limitation that this study was only done in one hospital, it has not fully represented the whole opinion of nurses about the new design of device expectation for the intravenous system of therapy. The recommendation of this study is that a new intravenous system device that will be designed, will be tested at this hospital as well.

However based on the results of this study can provide significant implications about the features of the new intravenous system device needed by nurses, therefore this research can continue to create a new device about intravenous systems which useful for nurses to support the implementation of nursing care effectively.

Conclusion

The new design of intravenous system device was expected have several important features and criteria based on nurse's need to support effective nursing care, this feature and criteria consist of having an economical price for patients and hospitals, have a multi-automatically system (stop automatically, monitoring remaining intravenous fluid automatically, drops calculate automatically, alarm system automatically, internet monitoring), the device must be flexible for mobility and easy to use.

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Demographic Factors and Disease History Associated with Dementia among Elderly in Nursing Homes

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Abstract

Dementia is increasing in the world which is a major cause of disability and dependence in the elderly. This causes the elderly can not do their daily activities so often live in a nursing home. It is important to know the factors associated with dementia to prevent and treat dementia with appropriate interventions. The objective of this study was to identify the demographic factors and disease history associated with dementia among elderly in nursing homes. The research method was cross sectional study. Sample were recruited from three nursing homes located in Bandung and Garut using purposive sampling technique for a-3 month period (n=163). Data were collected using questionnaire consisting of demographic data, disease history, and MMSE (Mini Mental State Examination). The analysis of data was performed using chi-square test, fisher test, and logistic regression analysis. In term of its association with dementia, low education had the higher odd ratio (OR: 5.90, 95% CI: 2.02-17.20, p=0.001) than unmarried status (OR: 4.78, 95% CI: 1.23-18.52, p=0.024) and stroke (OR: 0.23, 95% CI: 0.06-0.88, p=0.032). However, diabetes mellitus was identified as confounding variable (OR: 0.10, 95%CI: 0.01-1.01, p=0.051). In conclusion, low education, unmarried status, stroke, and diabetes mellitus were predictor factors of dementia among elderly in nursing homes. It is recommended to include effective treatment could be in the form of health education about management of stroke and diabetes, physical activity, improvement of nutritional adequate, and social activities to prevent loneliness.

Keywords: Dementia, diabetes mellitus, education, marital status, stroke.

Introduction

Dementia is a clinical symptom that is indicated by the degradation of cognitive function progressively that burdens an individual's daily activities (Duong, Patel, & Chang, 2017). In 2015, there were around 46.8 million of people with dementia worldwide, which was predicted to increase up to 74.7 million in 2030 and 150 million in 2050 (Livingston et al., 2017; Baumgart et al., 2015). The estimated number of people with dementia in Indonesia in 2015 reached 1.2 million. That number is predicted to double by 2030, and to 4 million by 2050 (Kemenkes RI, 2016). This is related to higher life expectancy in people in developed countries, so that the elderly population and dementia people also increases.

Dementia globally is a health and social care problem that affects individuals, families and friends due to an increase in dependency, behavior change, and health financing (Livingston et al., 2017; Fitriana et al., 2019). In 2015 it was estimated that the cost for dementia management was USD 818 billion globally and was predicted to continue to increase along with the increase in dementia population (Livingston et al., 2017). Cognitive decline is one of the reasons for families to transfer the elderly to the institutional care in nursing homes, especially those with severe dementia, behavioral disorders, depression, and disturbances in carrying out daily activities (Dramé et al., 2012; Toot, Swinson, Devine, Challis, & Orrell, 2017). However, a study demonstrated that dementia patients is found 19 times higher in nursing home than in the community (Hoffmann et al., 2014).

The association of Alzheimer's reports that diabetes, obesity, smoking, and hypertension can increase the risk of dementia (Baumgart et al., 2015). Other factors related to dementia are age, ethnicity, gender, genetic, physical activity, drugs, education, alcohol, comorbidities, and the environment (J. H. Chen, Lin, & Chen, 2009). According to Perhimpunan Dokter Spesialis Saraf Indonesia (2016), risk factors of dementia involve unmodifiable risk (age, gender, genetic factors) and modifiable risk (hypertension, hypercholesterolemia, diabetic mellitus, stroke, diet, exercise, stress, heart disease, high homocysteine, and follicle acid deficiency).

A study in China involving 943 elderly in nursing homes revealed that the stroke history had risk 1.515 times becoming dementia (Xu et al., 2017). Meanwhile, a study in Taiwan show that increased dementia is found 1.42 times in the elderly with widowed or widowed status (Fan et al., 2015). Xu et al (2017) study show that age related to dementia among elderly in nursing homes (OR 1.029). The other study show that osteoarthritis had risk 1.25 times (Huang et al., 2015) and diabetes 1.18 times (Crane et al., 2013) becoming dementia. However, a study about disease history as modifiable risk of dementia in Indonesia is limited. The purpose of this study was to identify demographic factors and disease history associated with dementia among elderly in nursing homes.

Method

A cross-sectional study was conducted from January to March 2019. The subject of the study was taken using purposive sampling technique from three nursing homes: Budi Pertiwi Bandung, Senjarawi Bandung, and Rehabilitasi Lansia Garut, West Java. Nursing homes provide residential care for elderly also reffered to as old people's homes, care homes, or long-term facilities. The subjects involved in this study had fulfill the age criteria (> 60 years), good hearing and vision, and were willing to become subject of the study. In total, 176 subjects aged 60 years and older were initially enrolled in the study, of whom 13 subjects were excluded for the following reasons: refusal to partisipate, language problems, and severe auditory and visual deficits. The elderly subjects or their caregiver signed the informed consent before the study was conducted. The study was conducted at the Ethic Committee of Universitas Padjadjaran (No.1266/UN6. KEP/EC/2018).

The instrument to collect the data was a questionnaire containing questions related to respondents' identity and anamnesis related to disease history according to the doctors or nurses. The dementia test used MMSE (Mini Mental State Examination) containing

30 questions related to orientation, memory, language, registration, and attention, with the score < 24 was set as criteria for dementia (Arevalo-Rodriguez et al., 2015). Data was collected by interviewing the elderly subjects and nursing home staffs, observing the ability to do daily activities, and physical assessment of the elderly subjects.

The elderly subjects were divided into two groups, dementia and non-dementia (including the MCI patient). Demographic data consists of age, sex, education, and marital status. Educational categorization divided the subjects into high and low levels of education. Low level education covered subjects who were education ≤ 9 years or never receive formal education, elementary school level, and junior high school level). Meanwhile, the subjects with educational background of senior high school and higher were considered having high level education. Marital status classified the subjects into married and unmarried (never married, widowed, or divorced). Meanwhile, disease history consist of hypertension, heart disease, stroke, diabetes mellitus, rheumatic, osteoarthritis, and uric acid.

The data were analyzed using statistical program for social sciences (SPSS) version 25. The elderly subjects were divided into two categories: dementia and non dementia. Univariate tests using mean and standard deviation, frequency, and percentage. Test of Normality used Kolmogorov smirnov. Mann-whitney used to compare numerical data (MMSE, BMI (body mass index), sistole, diastole) and chi-square test or fisher exact test to compare categorical data (age, sex, education, marital status, disease history). Multivariate tests used logistic regression to determine the final model of variables related to dementia (Nuraeni, Mirwanti, Anna, & Nurhidayah, 2019). Multivariate analysis revealed the result of calibration test of Hosmer-Lameshow with the value p=0.772. The Hosmer-Lameshow test to determine goodness of fit for logistic regression models. Differences were considered statistically significant for p values of less than 0.05.

Results

The research was conducted for three months from January to March 2019 on 176 elderlies in three nursing homes. On 163 elderlies who fulfilled the inclusion criteria consists of 110 elderlies gained the average score of MMSE was 12.78 ± 9.23 for dementia group and 53 elderlies gained the score was 26.85 ± 2.01 for non-dementia group (p<0.001). However, there were no significant comparison on body mass index, sistole, and diastole between dementia and non-dementia group (Table 1).

Most of the dementia elderly, 84 elderlies (69.4%) were in the ≥70 years age category; 81 elderlies (71.1%) were female; 104 elderlies (73.2%) had low education; 106 elderlies (69.3%) were unmarried; and 57 elderlies (64.8%) had hypertension history.

Table 1 Characteristics of the elderly with and without dementia

Variable	Dementia (n=110)	Non-dementia (n=53)	p
MMSE (score), mean (sd)	12.78 (9.23)	26.85 (2.01)	<0.001*
BMI (score), mean (sd)	21.62 (3.51)	22.61 (3.92)	0.070
Sistole (score), mean (sd)	131.59 (19.53)	131.17 (15.98)	0.843
Diastole (score), mean (sd)	78.11 (9.74)	77.15 (7.87)	0.451

**p<0.05; p-value were derived from Mann-whitney test*

Table 2 Association of demographic profile and disease history with dementia

Variable	Dementia (n=110)	Non-dementia (n=53)	p	OR	(95%CI)
Age (years), n (%)					
60–69	26 (61.9)	16 (38.1)	0.370	0.72	0.34–1.49

≥70	84 (69.4)	37 (30.6)			
Sex, n (%)					
Female	81 (71.1)	33 (28.9)	0.138	1.69	0.4–1.49
Male	29 (59.2)	20 (40.8)			
Education, n (%)					
Low	104 (73.2)	38 (26.8)	<0.001*	6.84	2.48–18.92
High	6 (28.6)	15 (71.4)			
Marital Status, n (%)					
Unmarried	106 (69.3)	47 (30.7)	0.062	3.38	0.91–12.55
Married	4 (40)	6 (60)			
Hypertension					
Yes	57 (64.8)	31 (35.2)	0.423	0.77	0.39–1.48
No	53 (70.7)	22 (29.3)			
Heart disease					
Yes	4 (66.7)	2 (33.3)	0.636	0.96	0.17–5.43
No	106 (67.5)	51 (32.5)			
Stroke					
Yes	4 (36.4)	7 (63.6)	0.029*	0.25	0.007–0.89
No	106 (69.7)	46 (30.3)			
Diabetes mellitus					
Yes	1 (16.7)	5 (83.3)	0.014*	0.09	0.01–0.77
No	109 (69.4)	48 (30.6)			
Rheumatic					
Yes	19 (82.6)	4 (17.4)	0.095	2.56	0.82–7.94
No	91 (65.0)	49 (35.0)			
Osteoarthritis					
Yes	14 (77.8)	4 (22.2)	0.323	1.79	0.56–5.72
No	96 (66.2)	49 (33.8)			
Uric Acid					
Yes	3 (50)	3 (50)	0.301	0.47	0.09–2.40
No	107 (68.2)	50 (31.8)			

*p<0.05; p-value were derived from chi-square or fisher test

Table 3 Final model factors associated with dementia

Variable	B	S.E.	Wald	df	p	OR	(95%CI)
Low education	1.78	0.55	10.56	1	0.001	5.90	2.02–17.20
Unmarried status	1.57	0.69	5.13	1	0.024	4.78	1.23–18.52
Stroke	-1.48	0.69	4.58	1	0.032	0.23	0.06–0.88
Diabetes mellitus	-2.27	1.16	3.81	1	0.051	0.10	0.01–1.01

*p<0.05; B: beta; S.E.: standar error; OR:odd ratio; CI: confidence interval

Bivariate test showed that dementia was significantly related to education ($p<0.001$). Dementia was also shown to significantly correlated with stroke ($p=0.023$) and diabetes mellitus ($p=0.007$) (Table 2).

The logistic regression results showed that dementia was significantly related to low education (OR: 5.90, 95% CI: 2.02-17.20, $p=0.001$), marital status (OR: 4.78, 95% CI: 1.23-18.52, $p=0.024$), stroke (OR: 0.23, 95% CI: 0.06-0.88, $p=0.032$). However, diabetes mellitus was identified as confounding variable (OR: 0.10, 95%CI:0.01-1.01, $p=0.051$) (Table 3).

Discussion

The results showed that demographic factor and disease history that associated with dementia among the elderly in nursing homes consists of low education ($p=0.001$), unmarried status ($p=0.024$), stroke ($p=0.032$), and diabetes mellitus ($p=0.051$). The study showed that the number of elderly subjects with dementia in the studied nursing homes was higher than those without dementia, and this had close correlation with the factors of age, sex, and education. A study in Europe involving 45,340 elderly demonstrated that the group of patients of < 75 years old had dementia score of 1%. This figure increased to 3.5% in the age group of 75-84 years and 10.4% in the age group of > 84 years (Ferreira, Brandão, & Cardoso, 2018). Although our results did not show relation with age, this factor is considered one of the determining factors for dementia (Qiu & Fratiglioni, 2018).

The higher percentage of female subjects in our study might be related to the longer life expectancy in female compared to male. In addition, the physiology of female individual is influenced by alteration of hormonal level. Thus, the decreased level of estradiol in menopause women compromises the protective function estrogen as an antitoxic agent that leads to neuronal death (Hestiantoro et al., 2019; Fitriana et al., 2019). Chêne et al (2015) study show that the risk of dementia in women is significantly higher than men after the age of 85 years. This finding is in line with a study in China show that sex not related with dementia (Xu et al., 2017). Chen et al (2016) study found that increased risk of dementia among older women associated with short sleep duration, that is ≤ 6 hours/ night (HR 1.36).

The results further showed that the lower the education level elderly had 5.9 times the risk of becoming dementia. This finding is in line with a study conducted in China, involving 943 subjects, showing a correlation of high level of education with low risk of dementia (OR 0.587) (Xu et al., 2017). Another study has demonstrated that high level of education could prevent dementia by maintaining cognitive function (Lamotte et al., 2016). A systematic literature review revealed contradictory results with regard to correlation between education and dementia. In 58% of the reference significant correlations were shown while in the rest 42% of no correlation was found. The data suggested, however, relationship between education and dementia was consistent in developing compared to the developed regions (Sharp & Gatz, 2011). Post mortem brain histology could further delineate the correlation between education level and dementia, as demonstrated by a study which showed that individuals with higher education had higher brain weight compared to those with lower education level. The study associated this finding with higher synaptodendritic development which eventually led to neurogenesis in individuals with higher education level (Brayne et al., 2010).

Marital and parental status were shown to play important role in the incidence of dementia as shown by a study result involving 354 dementia respondents that demonstrated widowed patients and those who had no children had higher risk of developing dementia (Sundström, Westerlund, Mousavi-Nasab, Adolfsson, & Nilsson, 2014). Different study recruiting 10,432 elderly that showed increased risk of dementia in individuals with widow or widowed status further corroborate the relation of marital status in dementia (Fan et al., 2015). The absence of partner was associated with stressful events leading to depression, and eventually lowered cognitive performance and dementia. Increased risk of dementia was also observed in unmarried subjects, especially in divorced and unmarried

at all, aged 50 to 64 compared to those who were married.

Several hypotheses have been put forward on the protective effects of marriage against dementia. Marriage is associated with increase social support that could prevent anxiety and depression (Holwerda et al., 2014). An aspect related to marriage is sexual activity, and in this respect a study involving 6,833 subjects of 50 to 89 years of age found that subjects who were sexually active for one year showed lower risk of dementia (Wright & Jenks, 2016).

In this study we found significant relationship between dementia and stroke (p=0.032). This is because stroke can cause vascular dementia (Xu et al., 2017). In line with our data, the results of a prospective cohort study from 22 hospitals and 8 studies in the community with 7,511 subjects revealed a higher prevalence of pre-stroke dementia. Furthermore, an earlier study showed that 10% of patients had dementia before the first stroke, 10% developed dementia soon after the first stroke, and one third of the subjects had dementia after multi strokes (Pendlebury & Rothwell, 2009). Studies investigating stroke has certain characteristics which may increased risk of dementia such as the presence of multiple lesion, the volume of infarcts and the location of stroke (e.g. left hemisphere). According to pathogenic mechanisms process in brain a neurodegenerative process triggered by stroke by disrupting amyloid clearance or by activating autoimmune responses to brain antigens produced post-stroke and its also related to accumulation of amyloid in arterial walls of cerebrovascular (Kuźma et al., 2018).

In this study we found the final model of factors that associated with dementia showed that diabetes mellitus is confounding variable (p=0.051). This is because causative relationship between diabetes and cognitive decline in patient with dementia has not yet been clearly established. Inadequate cerebral circulation and recurrent hypoglycemic episodes in diabetic vascular diseases have been suggested to cause subclinical brain damage and permanent cognitive impairment (Li, Cesari, Liu, Dong, & Vellas, 2017; Kurniawan & Yudianto, 2016). Besides that, type 2 diabetes mellitus could cause cognitive impairment due to neurogenesis damage, vascular dysfunction, brain-blood barrier dysfunction, inflammation, hyperglycemia, and insulin resistance that lead ischemia and accelerates the pathology of Alzheimer's disease (Umegaki, 2014). The other study showed that diabetic patients were 60% higher at risk of developing dementia than those without diabetes, and women with diabetes had 19% higher risk of developing vascular dementia than men (Chatterjee et al., 2016).

Conclusion

The results of the study showed that demographic factors and disease history that associated with dementia among elderly in nursing homes included low education, unmarried status, stroke, and diabetes mellitus. One of the consequence of these findings is that appropriate interventions are needed to prevent and treat dementia in the elderly staying in nursing homes. Health workers can prevent and slow the progression of dementia by providing health education about management of stroke and diabetes, physical activity, improvement of nutritional adequate, and social activities to prevent loneliness. Further studies can be conduct on the prevalence and risk factors of dementia with a greater number of respondent both in nursing homes and community in Indonesia.

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Beta Binaural Beats and its effects on the Cognition of Nursing Students in a Private Higher Education Institution

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Abstract

Studying nursing comes with a certain expectation to work hard and take a certain amount of time. A promising method called beta binaural beats is thought to improve cognitive functions. This study aimed to determine whether listening to beta beats is an effective method for improving cognition among nursing students. A double-blinded experimental research design was utilized and measured the effects of the intervention towards memory, abstract reasoning and reading comprehension. A total of 89 subjects participated in this study. Only the score of reading comprehension showed a significant difference (t=2.38, p=.02). The findings suggest that beta beats is an effective way in enhancing reading comprehension. However, findings show that beats aren't effective in enhancing memory and abstract reasoning. Therefore, this may be used as a method to enhance learning.

Keywords: Abstract reasoning, beta binaural beats, cognition, memory, nursing students, reading comprehension.

Introduction

A student carries a lot of responsibilities and one of the essential key responsibilities is to study. Many students enter college expecting good times, friendship and a good sense of direction. However, that is not always the case, students later figure out how challenging and struggling college life is. A study by Dy et al. (2015) entitled "Stressors and Stress Responses of Filipino College Students" stated that out of 258 students, 72% manifested cognitive stress responses due to academic stressors.

Moreover, studying nursing comes with a certain expectation to work harder on average than most other students. They deal with lectures and practical taking up a great deal of time. In addition, nursing is considered to be one of the most stressful career choices. It entails student to gain knowledge and skill through classroom lectures, long exam, return demonstration and rotating shift works in the hospital and participate in community programs.

A nurse is required to know anatomy and physiology, biology, pharmacology and other areas of nursing science. However, nursing students have difficulty in remembering too much information. A study conducted by Potter et al. (2005) stated that nurses who have lower working memory capacity are more likely to make medical errors.

Furthermore, usually most students read and highlight terms or definitions they don't even understand (Conca, 2010). Although remembering concepts are significant, it is highly important to be able to comprehend as well since nurses play a huge role in providing patient education. Contextualized learning experience and collaborative construction of knowledge is important in achieving positive outcomes for students' clinical- reasoning skills (Yauri et al., 2019).

As early as their first year, nursing students are taught to think outside the box. They are trained to develop critical thinking skills. Nurses are faced with decision-making situations in patient care, and each decision they make impacts patient outcomes. Nursing critical thinking skills drive the decision-making process and impact the quality of care provided (Vest as cited in Ericksen, 2017).

As students in the chosen profession for the present study, the researchers have witnessed the need for improving cognitive processes: memory, reading comprehension and abstract reasoning. Students often complain on how to attain memory retention while being able to comprehend medical terms and as to how to choose the best answer in situational questions during long exams.

Based on literature, there is a promising tool used to enhance cognitive functions called binaural beats. Binaural beats, discovered by Heinrich Wilhelm Dove, is the difference between two pure tones with different frequencies introduced to each ear separately that is perceived by the brain (Oster, 1973). It has shown to entrain brainwaves from one state to another. Binaural beats is thought to exert effect on cognitive functioning and mood (Lane et al., 1998) specifically beta binaural beats. A study conducted by Garcia-Argibay et al. (2017) revealed significant findings of beta frequency binaural beats amounting to 20 hertz to the subjects who performed free recall and recognition tasks. Exposure to beta frequency binaural beats yielded a great proportion of correctly recalled words and a higher index in recognition tasks. Another study on the effects of beta binaural beats conducted on college students showed a significant increase in their memory (Kennerly, 2013). This study test investigated whether listening to beta binaural beats is an effective method for improving cognition such as memory, reading comprehension and abstract reasoning among nursing students.

Methods

An experimental research design was utilized in the study wherein an intervention or treatment was introduced. Experimental studies are designed to test causal relationships to test whether the intervention caused changes in or affected the dependent variable (Polit & Beck, 2017). The dependent variables are the quality of memory, reading comprehension, abstract reasoning and the independent variable is the use of binaural beats.

The study was performed in an institution in highly urbanized city in the Philippines

offering five programs of study: Nursing, Medical Technology, Physical and Occupational Therapy and Biology. The subjects were from the fourth-year nursing students. Experiment was done in one of the classrooms for two days. The room can accommodate up to 50 people and is air conditioned and well ventilated.

The researchers decided to utilize the total population of the fourth-year nursing students, which is a total of 100 subjects excluding the researchers. They are divided into two sections. Section A has 52 students while Section B has 48 students. Only 89 subjects participated (45 for experimental group, 44 for control group) in the study since eight of these students had another important school activity to attend to, two of the students had an important family event and one was excluded from the study due to a heart problem (premature ventricular contractions). Majority (83%) of the subjects were females (See Table 1). The study was approved by Velez College Ethics Review Committee prior to data collection. All eligible research subjects were informed through phone or personal contact that they were invited to participate in the study and should meet the researchers at the actual research venue for a short orientation. Eligible students were asked to read the consent form which contained the procedure, duration and sessions, possible risks and benefits of the study involved in the binaural beats music therapy. The subjects were randomly assigned to either experimental or control group. The subjects were screened first with a researcher made screening tool which required them to write their names and age. A yes or no question screening tool was given since there were certain conditions which were contraindicated with binaural beats such as seizure, individuals with pacemakers and heart problems and to know if the subjects had their own earphones and smartphones. The researchers lent smartphones and earphones for those who didn't have. The participants were blinded and did not know which group they were assigned. The study only took one session for each subject since the immediate psychological effects on memory, attention were shown to benefit from even a single session of brainwave entrainment (Huang & Charyton, 2008). Brainwave Entrainment is a method of influencing or shifting brainwave patterns and binaural beats is type of audio brainwave entrainment. The binaural beats were done in the same room but in a different day for each section. To enhance attendance in the study the students were reminded personally or was contacted through their phone to remind them about the scheduled session. Each subject was required to bring their own earphones and phone to be used during the intervention. There were 2 audio files, one file contains the beta binaural beats (experimental) and the other has the delta binaural beats (control), one of the 2 files were blue toothed randomly by the researchers to each subject's smartphone. A pretest was given first followed by the intervention. During the intervention everyone followed the signal of the researchers as to when they would play and listen to the binaural beats. They were informed that they are not allowed to listen to any other music but only the binaural beats. The control group listened to delta binaural beats while the experimental group listened to beta binaural beats for 15 minutes. The beta binaural beats used is standardized already in which the difference between two ears is 20Hz since we are using beta beats it should be around 14-30 hertz and the volume was on what the subject is most comfortable with. Once everyone was done listening to the binaural beats, they immediately took the post test. The pretest and post test questions were not of the same content but had the same level of difficulty.

To test for memory, a researcher made tool was given in which 20 random medical-related words were mentioned for a maximum of five minutes and then the research subjects were asked to write as much as they can remember after they took the reading comprehension exam. For reading comprehension the International English Language Testing System will be the instrument used. It is the most appropriate instrument to measure the variable. The IELTS is an international standardized test of English language proficiency. IELTS has four parts which are the following: listening, reading, writing which are completed in one sitting and speaking. Only the reading part of the IELTS was utilized by the researchers. It

is composed of 13 items in which they have to answer questions regarding the story or article they have read. For abstract reasoning, the Non-Verbal Figurative Test by GetMyUni (n.d.) was used. It is composed of 15 items in which they were to choose from the choices on which figure was missing. The scores were interpreted by getting the mean score for each test and then standard deviation was used to measure how scores differ from the mean score.

Statistical analysis was done using SPSS with $p < 0.05$ as the significant value. Demographic data were processed using descriptive statistical analysis. In addition, the differences between and within groups were analyzed using the paired t-test, and independent t-test

Results

A total of 89 subjects participated in this study. They were allocated into two groups. The control group (n=44) received the delta binaural beat while the experimental (n=45) received the beta binaural beat.

As observed in Table 1, in a total number of 89 subjects, they ranged from about 18-23 years old. The average age is 20 years old.

Table 1 Demographic profile of fourth year nursing students

Profile	F	%
Age*		
18	1	1.12
19	37	41.57
20	39	43.82
21	7	7.87
22	4	4.50
23	1	1.12
Gender		
Male	15	16.85
Female	74	83.15

Note: *Mean= 19.76; SD= 0.88

Table 2 Pretest Scores of Experimental and Control Group

Variable	Control		Experimental		t	p	CI	
	M	SD	M	SD			LL	UL
Memory	6.27	2.20	6.33	2.71	0.12	0.91	-0.98	1.10
Reading Comprehension	5.95	2.01	6.04	2.24	0.20	0.84	-0.81	0.99
Abstract Reasoning	9.18	2.04	8.73	2.30	-0.97	0.33	-1.36	0.47

Note: M=mean, SD=standard deviation, CI=confidence interval, LL=lower limit, UL=upper limit

Table 3 Pre-test and Post-test Scores of Experimental and Control Group

Variable	Pretest		Post-test		t	p	CI	
	M	SD	M	SD			LL	UL
Experimental								
Memory	6.44	2.83	7.28	3.30	-1.62	0.11	-1.90	0.21

Reading Comprehension	5.95	2.35	6.95	2.19	-2.33	0.03*	-1.87	-0.13
Abstract Reasoning	8.82	2.32	8.69	2.37	0.30	0.76	1.73	0.99
Control								
Memory	6.20	1.81	6.86	3.19	-1.17	0.25	-1.80	0.48
Reading Comprehension	6.03	2.08	5.71	1.71	0.75	0.46	-0.53	1.16
Abstract Reasoning	9.40	2.05	8.66	2.93	1.37	0.18	-0.36	1.85

Note: M=mean, SD=standard deviation, CI=confidence interval, LL=lower limit, UL=upper limit

*p<0.05

Table 4 Post-test Scores of Experimental and Control Group

Variable	Control		Experimental		t	p	CI	
	M	SD	M	SD			LL	UL
Memory	7.05	3.32	7.04	3.18	0.001	0.99	-1.37	0.37
Reading Comprehension	6.00	1.84	7.00	2.11	2.38	0.02	0.16	1.84
Abstract Reasoning	8.59	2.67	8.51	2.31	-0.15	0.88	-1.13	0.97

Note: M=mean, SD=standard deviation, CI=confidence interval, LL=lower limit, UL=upper limit

*p<0.05

Table 5 Adverse effects experienced by the research subjects

	Experimental	Control	Total
Headache	2	4	6
Ringing of ears	2	3	5
Both	2	2	4
None	39	35	74
Total	45	44	89

Majority were females (83%).

An independent t-test further revealed that that there is no significant difference in pretest scores of both groups for memory (t =.12, p =.91), reading comprehension (t =.20, p =.84) and abstract reasoning (t =-.97, p =.33).

To test if there is a significant difference between the experimental and control group's pretest and post test scores, a paired t test was done. The paired t-test revealed that there is no significant difference in the control group in terms of memory (t =-1.17, p=.25), reading comprehension (t =.75, p =.46) and abstract reasoning (t =1.37, p = .18). On the other hand, the experimental group showed a significant difference in reading comprehension (t =-2.33, p =.03).

An independent t-test further revealed that there was no significant difference in post-test scores of both groups for memory (t =.001, p =0.99) and abstract reasoning (t =-.15, p=.88). However, there is significant difference in the post test score for reading comprehension (t =2.38, p =.02).

As seen in Table 5, a total 15 people experienced adverse effects. Six people experienced headache, five people experienced ringing of the ears, and four people experienced both.

Discussion

The pre-test scores between scores indicates that both, the experimental and control group, are more or less likely of the same level in terms of cognition specifically in memory, reading comprehension as well as abstract reasoning. This would reflect a successful randomization of subjects between the two groups. Randomization pertains to the random selection of each subject to a group of either experimental or control with its primary function to secure comparable groups for equality with respect to extraneous variables. It is considered to be the most effective method of controlling extraneous variables and eliminates selection bias in which the random selection of subjects to either the experimental or control group is not achieved (Polit & Beck, 2017).

Those in the experimental group had higher scores in reading comprehension compared to the control group. This suggests that the beta binaural beats is effective in reading comprehension. This is in line with the Helmholtz's theory which states that a frequency following response is made by the brain to match the frequency of the stimuli which entrains the brain into a beta brainwave pattern. Beta brainwaves is associated with attention. Moreover, it is said that the higher the attention span, the more likely it is for reading comprehension to increase (Yildiz & Çetinkaya, 2017). This suggests that the beta binaural beats is effective in reading comprehension. Furthermore, attention would influence information processing of complex information (Wulandari & Ismail, 2019).

Studies show that an enhanced reading comprehension skill improves reading fluency. It increases the accuracy of word recognition and would allow you to understand structured sentences clearly while skimming and scanning. These studies have also stated that reading comprehension is associated with attention. In line with that, studies have shown that beta binaural beats can increase attention (Garcia-Argibay et al., 2019; Kennel et al., 2010)

However, the paired t-test in the experimental group revealed that there is no significant difference for memory ($t = 1.62$, $p = .11$) and abstract reasoning ($t = .30$, $p = .76$). This is contradicting to several studies which stated that beta binaural beats is an effective method in facilitating memory. (Garcia-Argibay et al., 2019; Huang & Charyton 2008; Kennerly, 2013). No studies have been found with regards to the effects of beta binaural beats on abstract reasoning.

After the intervention was done, the scores of the experimental group in terms of reading comprehension improved. Improving reading skills will reduce unnecessary reading time and enable a person to read in a more focused and selective manner. The person will also be able to increase their levels of understanding and concentration. Among other studies, an effective result in memory was shown after using beta binaural beats as an intervention (Garcia-Argibay et al., 2019; Huang and Charyton, 2008; Kennerly, 2013). On the other hand, no studies were found about the effects of beta binaural beats on abstract reasoning. Ringing of the ears was a side effect based on experience by the subjects. For the subjects who experienced these effects, they were given the choice whether they would want to continue to participate in the study. All 15 subjects who experienced these effects claimed that they were relieved after resting or sleeping.

There may be some potential limitations to this study. Only the 4th year nursing students were included in the study since there were no enrollees for the lower year levels due to a recent shift in the basic education system during data collection. Therefore, a larger population may increase the possibility of obtaining a significant relationship. The study was conducted in the afternoon wherein the subject was already exhausted due to their morning classes. Lastly, there are unavoidable external noises that may have altered the result of the study.

Conclusion

Nursing students had improved their reading comprehension while using beta binaural beats. It is effective in reading comprehension, but not in memory and abstract reasoning. Therefore, beta binaural beats may use as a way of boosting cognition specifically

reading comprehension.

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The Effect of Combination Pranayama Yoga and Endurance Training Exercise on Peak Expiratory Flow (PEF) in Adult Asthmatic Patients

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Abstract

Pranayama Yoga can help improve breathing, and improve calm and also relieve stress. Endurance training can increase lung capacity, improve fitness, and relax the body. However, the combination of pranayama yoga and endurance exercises has never been done in asthma patients. The purpose of this study was to analyze the combination of pranayama yoga exercises and endurance exercises for Increased Peak Forced Expiration Flow. The design of this study was Quasy Experiment with a pretest-posttest control group design, the location of the study was in the pulmonary clinic of Universitas Airlangga Hospital and Haji General Hospital in Surabaya, East java. Respondents were selected by purposive sampling techniques in accordance with inclusion criteria with a total of 72 respondents. Peak Expiration Flow is measured from forced vital capacity or The peak expiratory flow (PEF) is the maximum flow obtained within the first 200 milliseconds of a forced expiratory maneuver after inhalation to total lung capacity (TLC). The intervention group was given a combination exercise by doing pranayama yoga and endurance exercise for 6 weeks, 2x per week, 51 minutes for each training session. Pranayama yoga combination exercises and endurance exercise using trainer instructors and modules. FPEF and asthma control were measured every week for 6 weeks. The results showed a significant difference in the level of FPEF and asthma control before and after 6 weeks of interventions combination of pranayama yoga and endurance exercise in the intervention group obtained significance values ($p < 0.05$) with $p = 0.000$ and asthma control in the intervention group ($p < 0, 05$) with $p = 0.000$ the results of the research shows that by practicing pranayama yoga and endurance exercise can improve FPEF and asthma control. Pranayama yoga and endurance exercise can be used as an complementary therapy in supporting pharmacological therapy to improve FPEF and control asthma.

Keywords: Asthma, endurance exercise, PEF, pranayama yoga.

Introduction

Asthma is a chronic airway disease that is a public health problem in various countries. Asthma can be mild and does not interfere with activities, but can be sedentary and disrupt activities and even daily activities. The prevalence of asthma has risen sharply and asthma is now known as the most frequent cause of disability, requires large costs and preventable illness (Atmoko, Faisal, Bobian, Adisworo, & Yunus Faisal, 2011; Yang ZY, Zhong HB, Mao C, Yuan JQ, Huang YF, Wu XY, Gao YM, 2016).

Asthma was once thought to be a disease caused by smooth muscle spasm, now asthma is a complex inflammation that controls clinical and physiological changes. Asthma sufferers are people who are dependent on drugs and breathing aids that require expensive costs. As a heterogeneous disease, asthma is usually characterized by chronic airway inflammation. Typical symptoms of asthma are wheezing, shortness of breath, chest tightness, and coughing that vary from time to time and experience limited expiratory airflow (GINA, 2018).

According to the World Health Organization (WHO, 2018), asthma sufferers of 235 million people, the death rate from asthma in Indonesia reached 24,773 people or about 1.77% of the total population of the population, this data also puts Indonesia at number 19 in the world regarding asthma deaths. GINA (GINA, 2018), an estimated 300 million people suffer from asthma. The average global prevalence of asthma ranges from 1% to 18% of the population of various countries. The number of asthma sufferers in the world reaches 300 million people. This number is expected to continue to increase to 400 million by 2025. The prevalence of asthma sufferers in Indonesia is 4.5% with the highest incidence occurring in women at 4.6%. The highest prevalence of asthma sufferers was found in Central Sulawesi (7.8%), followed by East Nusa Tenggara (7.3%), in Yogyakarta (6.9%), and East Java with an asthma prevalence of (5.1%) (Badan Penelitian dan Pengembangan Kesehatan, 2013).

Efforts made by health workers at Universitas Airlangga Hospital and Haji General Hospital in Surabaya, provide information about asthma such as avoiding stress, cold weather, dust, cigarettes, and other allergens and providing asthma medication but still do not show an increase in PEF and control asthma.

Asthma symptoms can be controlled by pharmacological and non-pharmacological therapies, pharmacological therapies, for example, administering lozenges and inhalation therapy. Providing pharmacological therapy aims to relax bronchial smooth muscle, increase mucociliary cleansing and modulate the release of allergen mediators from mast cells, but even though the patient has taken asthma treatment, there are still 50% of patients with the uncontrolled state, 30% partially controlled, 20% fully controlled (20% controlled) (Julvainda Eka Priya Utama, 2018; Quirt, Hildebrand, Mazza, Noya, & Kim, 2018). This shows that most patients are not controlled, despite asthma treatment. Until now, health workers continue to conduct research related to pharmacological and non-pharmacological therapies. Non-pharmacological therapy is used as a support for pharmacological therapy to increase peak expiratory flow (PEF) and the degree of asthma control. One of the non-pharmacological therapies that can increase the peak flow of forced expiration and asthma control is pranayama yoga practice and endurance exercise.

One of the non-pharmacological therapies that can increase Peak expiratory flow (PEF) and asthma control is yoga pranayama and Endurance training exercise. Yoga has been recommended for pulmonary rehabilitation programs and in addition to physical therapy in rehabilitation programs and has been shown to improve mind and body coordination. Yoga is called a "low-impact" sport that can be tailored to the needs and abilities of its practitioners so that it is suitable for anyone including asthmatics through asanas (yoga postures) and pranayama (breathing techniques). Short-term studies on yoga practice have reported an increase in pulmonary physiological parameters, increased diffusion capacity, reduced rates of stress due to tightness and improved quality of life (Cramer, Posadzki, Dobos, & Langhorst, 2014; Liu et al., 2014).

Breathing exercises in yoga can activate the hypothalamus part of the brain's response which can affect good emotions and have an effect on asthmatics (Chandra, 1994; Liu et al., 2014; William Fernando Benavides-Pinzón, 2017). In addition to Pranayama Yoga that can be given to asthma patients, there are epidemiological studies that endurance exercise can extend life expectancy and reduce the risk of chronic diseases. The effects of endurance exercise in addition to enlargement of muscle fibers, mitochondria which will increase the source of muscle energy, makes the muscles not easily tired. This is by the needs of asthma patients who tend to get tired quickly, causing shortness resulting in reduced life activities. This adaptation results in better health reduce the risk of morbidity and mortality and improve the quality of life (Abirami & Raj, 2013; Khotimah, 2013; Nizet et al., 2009; Safdar et al., 2011).

Exercise activity can be done by anyone, including asthmatics. Many asthmatics may feel afraid of doing exercise activity because exercise is also one of the triggers of an asthma attack, Rogger Catz of the University of California states that about 80% of asthma sufferers are caused by allergies and 40% fever, including asthma caused by exercise-induced asthma (EIA). However, EIA sufferers do not give up doing sports because doing good exercise can reduce the relapse and dependence of asthma medication (Côté, Turmel, & Boulet, 2018; Wijaya, 2015).

Several studies have proven several interventions given to asthmatics including asthma exercises, deep breathing, Buteyko, upper body exercises, and yoga pranayama as one type of intervention that can be done to protect and improve respiratory health helps to improve asthma and increase peak expiratory flow (PEF). However, it is not yet known the effectiveness of the combination of pranayama yoga exercises and endurance training exercise in increasing the Peak Expiratory Flow (PEF).

The combination of pranayama yoga practice and endurance exercise is expected to increase the peak flow of forced expiration and asthma control through bronchial smooth muscle relaxation and decreased respiratory frequency (Eichenberger, Diener, Kofmehl, & Spengler, 2013; Putra, Sriyono, & Yasmara, 2017). At present there is still limited research on this matter, so researchers are interested in analyzing the effect of a combination of pranayama yoga exercises and endurance exercise on increasing the Peak Expiratory Flow (PEF) and asthma control. Observing the high morbidity and mortality due to asthma that increases from year to year is a special concern from the world of health, one of which is in nursing that can provide independent intervention as a companion to pharmacological therapy. The objective of the study is to analize the effect of a combination of yoga pranayama and endurance exercise on Peak Forced Expiration Flow and control asthma.

Method

The design of the research was quasi-experimental with pretest-posttest control group design. This study uses a sampling technique in which samples are taken based on purposive sampling. This study uses respondents from 2 hospitals, for the intervention group conducted at Airlangga University Hospital and the control group was conducted at the Haji General Hospital in Surabaya. This was done so that respondents in the intervention group and the control group did not meet each other and did not tell each other about the interventions that had been given during the research process so that the research was not biased.

The target population in this study were adult patients who were diagnosed with asthma in the pulmonary clinic at Universitas Airlangga Hospital and Haji General Hospital in Surabaya, using history taking, physical examination, and spirometry examinations that had undergone outpatient treatment. In this study, 2 were excluded and 1 person refused to participate in this study. A total of 76 subjects consisting of 20 men and 56 women, 4 subjects in the control group who had dropped out of school because they could not follow the exercise regularly on a schedule. So that the total sample used in this study was 72 subjects.

Inclusion criteria in this study were asthma patients aged 17–60 years, good

oral communication, asthmatics were stable and able to sit and stand without the help of others and tools. While the exclusion criteria are, asthma sufferers in attacks, patients with shortness of breath due to complications of other diseases, patients with permanent physical disorders of the neck, chest, and upper extremities.

Peak Expiratory Flow measured from forced vital capacity or The peak expiratory flow (PEF) is the maximum flow obtained within the first 200 milliseconds of a forced expiratory maneuver after inhalation to total lung capacity (TLC). Peak Expiratory Flow was measured using a peak flow meter performed 3 times and the highest value was taken in each measurement while asthma control was measured using an asthma control test conducted before and after pranayama yoga practice and endurance training exercise for 6 weeks. The intervention group was given a combination exercise by doing pranayama yoga and endurance exercise for 6 weeks, 2x per week for 51 minutes for each training session. One-time joint training using the instructor and one time self-training at home using the module while still being monitored by family members and researchers by recording pranayama yoga exercises and endurance training exercises that have been done and each participant sends videos and documentation images to the group Whatsapp has been made by researchers. Pranayama yoga combination exercises and endurance exercise using instructor trainers and modules. The control group was conducted at the Haji General Hospital, by continuing to follow the treatment by the standard operational procedures (SOP) at the pulmonary clinic of the Haji General Hospital in Surabaya and was not allowed to practice yoga pranayama and endurance exercise while participating in the study. After the research is completed, the control group is given a module and exercises together with both the control group and the intervention group conducted at the Lake of Airlangga University or the Airlangga University Hospital.

The steps of the Pranayama yoga and Endurance Training Exercise technique: 1) The pose of sukhasana, 2) Padmasana, 3) Sidhasana, 4) Vajrasana. Next to do pranayama breathing consisting of; 1) Dhirgaswasam 5 minutes 2) Ujjayi 5 minutes 3) Kapalabhati 5 minutes 4) Anuloma viloma 5 minutes 5) Sitali 5 minutes 6) Sitkari 5 minutes. After doing yoga exercises for about 30 minutes, participants are encouraged to take a 5-minute break before doing Fartlek exercises for 21 minutes, by way of; warm-up exercises consisting of 20 seconds lunges, side lunges 20 seconds, squat 5 seconds, high knee 10 seconds. Then continue the exercise for 5 minutes, jogging 2 minutes, walking 5 minutes, jogging 2 minutes. Walk for 5 minutes. After ending the exercise it is recommended not to sit down immediately but to do the cooling consisting of; Hamstring stretch 20 seconds, Calf stretch 20 seconds, Forward bend 20 seconds. To prevent/ overcome the recurrence of subjects during pranayama yoga practice and endurance exercise or exercise-induced asthma (EIA), the researchers first coordinated with the supervisor and the responsible physician at the Hospital Universitas Airlangga and Haji General Hospital in Surabaya to prepare for inhaler drug therapy, oxygen, and warm-up before exercise and conditioning after doing the exercise. Subjects who experienced a recurrence during exercise then it is recommended not to continue training. In this study using pranayama yoga practice instruments and endurance exercise using informed consent sheets, Standard Operating Procedures (SPO), instructors, training modules and respondent characteristics sheets. In the measurement of the Peak Expiratory Flow Rate (PEFR) using, Peak Flow Meter, the respondent characteristic sheet that contains questions about the respondent's identity, including the initial name, gender, age, level of education, height, length of time suffering from asthma and the value of Forced Peak Expiratory Flow (PEFR) while for the assessment of the level of asthma control using ACT (Asthma Control Test) there are several things that are assessed namely the intensity of asthma recurrence in doing daily work, experiencing shortness of breath, waking up at night, the use of drugs and the level of asthma control which includes controlled asthma, partially controlled and uncontrolled. This study will evaluate the Pre-Post Forced Peak Expiratory Flow (FPEF) and asthma control by using

the achievement sheet of the Forced Peak Expiratory Flow (PEFR) asthma control observation sheets before and after pranayama yoga practice and endurance exercise.

Statistical test using the Wilcoxon test in the Peak Expiratory Flow Rate (PEFR) where the treatment group showed a significant difference between the PEFR. in the control group showed that there was no significant difference between the pre-test and post-test PEFR. In Prediction Peak Expiratory Flow (PEF) (%) using paired T-test where the treatment group showed a significant difference between PEFR (% predicted) before and after pranayama yoga combination training and endurance training exercise in the control group showed no significant difference between APE (% predicted) before and after. For the analysis of asthma control using the Wilcoxon test where the treatment group showed a significant difference between asthma control before and after the practice of pranayama yoga combination and endurance exercise. Paired T-test results in the control group showed no significant difference between asthma control before and after. MANOVA test results obtained a significance which indicates that there are differences in the average PEFR and asthma control values in the treatment and control groups. This shows that there is an effect of pranayama yoga combination training and endurance exercise in asthma patients.

Ethical approval was issued by the Airlangga University Hospital Research Ethics Commission with Number: 197 / KEH / 2018 on December 11, 2018, and the Haji General Hospital with Number:. 073/07 / KOM.ETIK / 2019 on 7 February 2019.

Results

Table 1 Respondent's Characteristic

Characteristic	Treatment Group (n = 34)		Control Group (n = 38)		P
	f	%	f	%	
Age years					
18–25	3	8.8	1	2.9	0.001
26–35	5	14.7		14.7	
36–45	11	32.4	5		
46–60	15	44.1	32	68.1	
Education					
No school	1	2.9	1	2.9	0.331
Junior High School	6	17.6	19	50.0	
High School	14	41.2	11	34.2	
College	13	38.2	7	18.4	
Occupation					
PNS	3	8.8	3	8.8	0.393
Enterpreneur	5	14.7	11	28.9	
Others IRT	26	76.5	24	63.2	
sex					
Male	5	14.7	11	68.8	0.210
Fimale	29	85.3	27	79.4	
Genetik					
No	10	29.4	10	26.3	0.567
Yes	24	70.6	28	73.7	

Table 2 The value of the PEFR, APE (%) prediction, asthma control in the treatment groups and the control groups

variabel	Groups	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	Delta (Δ)	P Value
PEFR (L)	Treatment	280.00±56,622	350.88±44.064	70.88	0.0001
	control	241.05±43.483	240.79±47.555	0.26	0.813
APE (%) PREDIKSI	Treatment	64.85±16373	82.68±11422	17.83	0.000
	Control	57.61±15559	57.42±15742	0.019	0.868
Asthma Control	Treatment	15.38±3.574	21.32±1,249	5.94	0.0001
	control	14.68±2.451	15.61±2.521	0.93	0.013

Table 3 Distribution of Asthma Control Levels in the Treatment groups and Control Groups

Asthma Control	Treatment Groups				Control Groups			
	Pre-test	%	Post-test	%	Pre-test	%	Post-test	%
Not controlled	29	85,3	1	2,9	38	100	36	94,7
Partially Controlled	5	14,7	33	97,1	0	0	2	5.3
Fully Controlled	0	0	0	0	0	0	0	0

Table 4 Results of multivariate analysis of a combination of pranayama yoga exercises and endurance exercise in the treatment groups and the control groups

Variable	N	Box Test				P value	
		Box M	F	df 1	df 2	Lavene	pillai's trace
PEFR	72	0.000	6.091	6	3.430	0.373	0,0001
Asthma Control						0,001	

Table 1 shows that the age characteristics of respondents by age, the majority of respondents in the treatment group and the majority of the control group were in the age range 46-60 years are 15 (44.1%) in the treatment group and 32 (68.1%) in the control group which is the age category early elderly and late elderly. Age demographic data of respondents from both groups showed variants of inhomogeneous data with a value of p = 0.001. this is because the age distribution in the two groups is not normally distributed and also the age factor affects lung function in a person. Regression test results obtained an R Square value of 0.06 meaning 0.6% PEFR and asthma control is influenced by age with a value of p = 0.526 so it can be concluded that the age group of respondents did not have a significant relationship. On the characteristics of the education level of respondents in the treatment group, the majority were middle educated 14 (41.2%) and in the control group, the majority were elementary education as many as 19 subjects (50.0%). The characteristics of work in the treatment and control group were mostly as IRT / other, in the treatment group were 26 subjects (76.5%) and the control group was 24 (63.2%). Sex characteristics in the two groups were majority female, in the treatment group were 29 (85.3%) women while in the control group were 27 (79.4%). Characteristics of respondents based on family history of asthma (genetic) in the treatment group were 24 subjects (70.6%) and the control group was 25 subjects (73.5%) who had a family / genetic history of asthma.

Table 2 After a combination of pranayama yoga exercises and endurance exercise for 6 weeks, the mean PEFR value of the post-test 350.88 ± 44.064 in the treatment group obtained a delta value of 70.88 (L). Wilcoxon

test results in the treatment group showed that there were significant differences between the PEFR before and after the pranayama yoga combination exercise and endurance exercise with a value of 0.001 (p <0.05). After being evaluated for 6 weeks, the mean post-test score was 240.79 ± 47.555 in the control group, the delta value was 0.26 (L). Wilcoxon test results in the control group showed that there was no significant difference between the APE pre-test and post-test with a value of 0.813 (p <0.05). In PEFR (% prediction) in the treatment group, the mean PEFR prediction value was 64.85 ± 16373% and post-test 82.68 ± 11422% and delta value of 17.83%. Paired T-test results in the treatment group showed that there was a significant difference between PEFR (% prediction) before and after the combination practice of pranayama yoga and endurance exercise with a value of 0,000 (p <0.05). In the control group PEFR mean (% predicted) pre-test 57.61 ± 15559% while post-test 57.42 ± 15742% delta value 0.019%. The results of the paired T-test in the control group showed no significant difference between PEFR (% predicted) before and after with a value of 0.868 (p <0.05). In the control group, the mean pre-test value was 15.38 ± 3,574 asthma control and after a combination of pranayama yoga exercises and endurance exercise for 6 weeks the post-test value was 21.32 ± 1,249 delta value of 5.94. Wilcoxon test results in the treatment group showed that there were significant differences between asthma control before and after the combination practice of pranayama yoga and endurance exercise with a value of 0,000 (p <0.05). In the control group, the mean value of asthma pre-test control was 14.68 ± 2.451 while in the post-test 15.61 ± 2.521. the control group obtained a delta value of 0.93%. Paired T-test results in the control group showed no significant difference between asthma control before and after with a value of 0.013 (p <0.05).

Table 3 shows that in the treatment group, the total pre-asthma control scores of subjects in the uncontrolled category were 29 (85.3%) subjects. At post asthma control, it showed that the subjects were partially controlled by 33 (97.1%) subjects and there were no subjects whose asthma was fully controlled (0%). In the control group, all pre-asthma control values were in the uncontrolled category 38 subjects (100%) in the post-asthma control were only 2 (5.3%) partially controlled subjects and 36 (94.7) subjects were still in the uncontrolled asthma criterion.

Table 4 shows that testing the variance-covariance similarity individually for each variable shows a Box test value of 0.000, which means that the variance-covariance in all variables is not the same for each group. So that in making decisions statistical test results can be seen in Pillai's trace. Manova test results obtained a significance value of P <0.0001 (α 0.05) which indicates that there are differences in the average PEFR and asthma control values in the treatment and control groups. This shows that there is an effect of pranayama yoga combination training and endurance exercise in asthma patients.

Discussion

Peak Expiratory Flow (PEF)

The peak flow of forced expiration is the highest point that can be reached during maximum expiration. In the event of asthma, there is great resistance to airflow, especially during expiration, when a person expires to reach a maximum flow where the flow cannot be increased even with a maximum increase in power (Moore & Castro, 2017).

Airways that have decreased space cause the maximum expiratory flow to also be reduced. Maximum expiration can be achieved if there is no worsening of breath and reduction of space in the respiratory tract (Hall, 2015). In the treatment group, the majority of subjects experienced an increase in the post- PEF score.PEF value measurement is done once every week after doing a combination of pranayama yoga exercises and endurance exercise for 6 weeks, performed 3 (three) times the examination and the highest value was taken in each measurement. In the treatment group, some subjects during the initial PEFR assessment until week 3 had not yet seen an increase in FPEF . This is in line with the research presented by (Begum & Hussain, 2013; Maya Kurnia, 2013; Eleckuvan, 2014; Parmar &

Nagarwala, 2014).

States that yoga interventions and effective end endurance training exercise are given at least 6 weeks of intervention with a frequency of exercise 3 times a week. So that in the 4th and 5th week, there was an increase in FPEF value. The increase in FPEF occurred significantly until the end of week 6. The increase in the peak flow of forced expiration shows that the pranayama yoga practice and endurance exercise that is done can affect the increase in FPEF value. The increase in FPEF in the treatment group occurred at all ages but the majority of the increase in FPEF occurred in the 4th to 6th week of the intervention. Characteristics of subjects who experience an increase in PEF are relatively diverse ranging from the level of education, age, occupation, gender, and genetic / family history of asthma.

This is due to the APE (% predictions) of the control group The difference in the median PEF and PEF predictions of the intervention group is greater when compared to the control group. All subjects experienced an increase in PEFR and FPEF scores (% predicted) in the intervention group. This is because RSUA doctors and nurses provide pharmacological therapy and health education to asthma patients undergoing outpatient therapy at RSUA Lung Poly. In addition, subjects also received an intensive assistance program that is a combination of pranayama yoga and endurance exercise. So it can be concluded that procedural treatments at the polyclinic of pulmonary disease and interventions combination of pranayama yoga exercises and endurance exercise show more improvement in one pulmonary function, namely an increase in forced expiratory peak flow (FPEF) and APE (% predicted).

Increased PEFR and PEF values (% predicted) in asthma patients indicate the patient has a good prognosis. This is due to lung repair. Improved pulmonary physiology shows the achievement of one of the outcomes in the implementation of nursing care. In this case, the patient is able to perform self-care by doing pranayama yoga exercises and endurance exercise independently so that an increase in the value of PEF.

In this study, a combination of pranayama yoga exercises and endurance exercise is carried out for 6 weeks and done 2 times a week, pranayama yoga exercises and endurance exercises are done 1 (one) time with group/group exercises using instructors (trainers) and 1 (one) time carried out independently at home with the duration of exercise required, namely; pranayama yoga exercises were carried out for 35 minutes and endurance exercises were carried out for 21 minutes.

The results of this study are in line with other studies which show that pulmonary rehabilitation will get very optimal results if done as early as possible (after the patient has been diagnosed with asthma by a doctor), one form of pulmonary rehabilitation in asthma patients is by giving pranayama yoga breathing exercises. Pranayama Yoga is a breathing exercise with slow and deep breathing techniques, using diaphragm muscles, allowing the abdomen to rise slowly and the chest to fully expand. Yoga is a method of physical and mental training for all ages. Yoga provides relaxation to the body, blood circulation, and control of breathing. Yoga is very good for asthmatics (Agnihotri, Kant, Kumar, Mishra, & Mishra, 2016; Agnihotri, Kant, Mishra, & Singh, 2016; Kristina Zaičenkovienė1,Roma Aleksandravičienė1, Stasiulevičienė1, & Lithuanian, 2013).

Yoga shows beneficial effects for people with chronic asthma such as reducing asthma medication, increasing exercise capacity, increasing FEV1, functional capacity and asthma control (Cebrià I Iranzo, Arnall, Camacho, & Tomás, 2014). Research conducted on asthma patients shows highly statistically significant results on all pulmonary physiology parameters. Pranayama yoga given to the yoga group for 6 weeks of practice showed a significant increase in FEV1 and PEFR in the pulmonary physiology tests of asthmatics who had performed pranayama yoga (Parmar & Nagarwala, 2014; Shyam Karthik, Chandrasekhar, Ambareesha, & Nikhil, 2014).

The effect of yoga obtained in this study is related to deep breathing techniques (pranayama) and meditation which causes a reduction in the frequency of breathing. This can modulate airway reactivity, increase breathing sensation through regulation of breathing patterns, reduce oxygen

consumption, reduce the incidence of hypoxia and hypercapnia so that blood oxygenation is better without increasing ventilation, increase respiratory endurance and muscle strength and modulate autonomic function with decreased heart rate when resting and sympathetic activity (Bonura, 2007; Sindhu, 2015).

Pranayama is a breathing technique in ancient yoga. Pranayama integrates the mind and body and is focused on bodily sensations. Pranayama directly provides benefits to various body functions positively. Pranayama consists of (1) regular, slow and strong inspiration for a longer duration during exercise, which causes the strengthening of the breathing muscles, (2) increases expiratory power and decreases resistance to airflow in the lungs (3) increases holding time breath according to the ability of participants (Fulambarker et al., 2012; Shankarappa, Prashanth, Annamalai, & Varunmalhotra, 2012).

In addition to pranayama yoga that can be given to asthma patients, epidemiological studies are stating that endurance exercises prolong life expectancy and reduce the risk of chronic diseases. The effect of endurance exercise besides enlargement of muscle fibers, mitochondrial enlargement also occurs which will increase the energy source of muscle work, so the muscles do not get tired easily. This is following the needs of asthma patients who tend to get tired quickly, causing shortness resulting in reduced life activities. This adaptation results in better health reduce the risk of morbidity and mortality and increase the quality of life (Chen, Tsai, Liou, & Chan, 2017; Khotimah, 2013; Nizet et al., 2009).

Exercise is a very good way to increase the vitality of lung physiology. Exercise stimulates deep breathing and causes the lungs to expand so that the input of oxygen released into the blood increases and more carbon dioxide is released. If a person has more oxygen volume, the blood circulation is better, so that the muscles get more oxygen and can do activities without feeling tired (Ahmed, Mohamed, & Hashem, 2011; Maya Kurnia, 2013a; MuthEffectivenessu Eleckuvan, 2014).

In this study, the treatment group was given a combination of pranayama yoga exercises and endurance exercise. In this case, endurance exercise is given by doing jogging fartlek for 21 minutes consisting of; 1-minute warm-up exercise, walk 15 minutes, jogging 4 minutes and cool down 1 minute. By doing fartlek exercises by walking and jogging, the principle of fartlek training is running with various variations. This means that it can measure the desired running speed while doing the exercise as desired and also adjusted the conditions / practical abilities according to Sukardiyanto in the study (Maya Kurnia, 2013b). Fartlek training is a part of endurance exercise that can increase lung capacity and increase respiratory muscles so that lung elasticity can be maintained. These conditions can open up lung space that can be used by alveoli in gas exchange. Fartlek can also stimulate sympathetic nerves in the respiratory muscles to excrete norepinephrine and epinephrine to bind to α receptors that cause the respiratory muscles to contract (Suryantoro, Isworo, & Upoyo, 2017; Udayani & Amin, 2019).

Asthma Control Level

Assessment of the level of asthma control using the ACT (Asthma Control Test), several things are assessed namely the intensity of recurrence of asthma in doing daily work, experiencing shortness of breath, waking up at night, the use of drugs and the level of asthma control. In some questions on ACT related to exacerbation/recurrence of asthma, which is a process of repeated attacks due to hyper-responsive immune cells such as mast cells, eosinophils and T lymphocytes, mast cells, macrophages, dendritic cells, and myofibroblasts to certain stimuli causing symptoms of shortness of breath, wheezing and coughing as a result of narrowing of the airway (Ghebre et al., 2015; Grzela et al., 2015). The results of this study indicate that pranayama yoga exercises and endurance training exercise are effective in asthma patients to improve asthma control. Asthma cannot be cured but can be controlled with proper management and management. This study is in line with other studies that show that the goal of asthma control is to reduce the frequency of asthma attacks, improve inflammation of the respiratory tract and

increase physical activity and pulmonary physiology (Baines et al., 2014).

Asthma control is generally divided into 2 namely controlled and uncontrolled. In the ACT (Asthma Control Test) assessment the classification of asthma control was divided into 3, which were fully controlled with a score of 25, partially controlled 20-24 and uncontrolled with a score of <19. In the category of partially controlled asthma control levels included in the classification of controlled asthma, it is related to individual efforts to achieve optimal asthma control that is fully controlled (Atmoko et al., 2011; Cramer, Lauche, & Dobos, 2014; Katerine, Medison, & Rustam, 2014).

The goal of asthma control is to reduce the frequency of asthma attacks, improve inflammation of the respiratory tract and increase physical activity and pulmonary physiology and also improve the quality of life which is also an important component in the management of asthma (Cramer, Lauche, et al., 2014; Shyam Karthik et al., 2014). Yoga exercises given for 2 months to asthma patients have an increase in forced vital capacity (FVC), forced expiratory volume in 1 second (FEV1), peak expiratory flow rate (PEF) (Agnihotri, Kant, Mishra, et al., 2016; Soni, Munish, Singh, & Singh, 2012).

If people with asthma are very unfit, then the exercise program can be started by walking, because this exercise has lower asthma and prepares the muscles, for training with a higher intensity in the future. If the level of fitness increases, especially in the case of the musculoskeletal system, then the intensity of the exercise can be increased by conducting a low-level interval training consisting of walking and jogging (Wijaya, 2015). Endurance training exercise aims to improve the efficiency and capacity of the oxygen transport system. Endurance training which means to build, restore, or maintain the condition of one's body so that it is very good for asthmatics (Khotimah, 2013).

In addition to the above statement by (Indrayana, 2013), fartlek is slow running which is then varied with intensive short sprints from medium distance running with a fairly high constant speed then interspersed with sprint running and jogging and sprinting again and so on, so variations in temp running can be played depending on the practical conditions. Nursing diagnosis of activity intolerance is a major problem that occurs in asthma patients. Activity intolerance is the inadequacy of psychological or physiological energy to carry out or complete activities that must / have been carried out.

One outcome that must be achieved in solving this problem is activity tolerance, with the limitation of respiratory status characteristics. In this research, the process of nursing care with Calista Roy's theoretical approach the results of the study showed an increase in the value of the Peak Expiratory Flow and Asthma Control Test (ACT) showed that the goal of nursing care was achieved.

According to Roy, as an open system, humans receive input or stimulus either from the environment or from within themselves, the level of adaptation is determined by a combination of focal, contextual, and residual effects. Adaptation occurs when someone responds positively to environmental changes. This adaptive response enhances the integrity of a person who will lead him to be healthy (Agnihotri, Kant, Mishra, et al., 2016; Soni et al., 2012).

When the body gets an external stimulus in the form of yoga breathing and Endurance Exercise, the body responds. The nurse is the key to ensuring the achievement of the client's adaptation goals. Nursing actions aim to enhance the adaptation of individuals and groups so that they contribute to improving health, quality of life.

Conclusion

The combination of pranayama yoga practice and endurance training exercise can increase the Peak Expiratory Flow (PEF) and Asthma Control Test (ACT). Based on the results of statistical tests, the combination of pranayama yoga exercises and endurance exercise can increase the peak force of forced exhalation (PEF) by 70,881 (L) and predictive peak flow prediction (% prediction) by 17.83% asthma control intervals by 38% and based on the results of Asthma Control Test (ACT) subjects who experienced an increase in control (partially controlled) asthma were 33 (97.1%), respondents. Pranayama yoga

and endurance training exercise can be used as an alternative choice in supporting pharmacological therapy to improve PEF and control asthma.

Research Limitations

In this study subjects used different doses of the drug so that it could affect the value of the Peak Expiratory Flow (PEF) and Asthma Control Test (ACT). Researchers also cannot control all respondent activities and trigger the occurrence of disturbances such as air pollution and irritants as well as the subject's uniformity of age.

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An Investigation of the Interests and Reasons of Diploma Nurses Undertake a RN-BSN Bridging Program in United Arab Emirates

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Abstract

The nursing programs across United Arab Emirates are in the process to inform students about RN-BSN bridging program. The study purpose was to determine the interests and reasons of nurses in enrolling to a RN –BSN bridging program. An online survey was conducted among diploma students to explore their interest and perspective regarding pursuing bridging program. One hundreds thirty-five RNs participated. The questionnaire used for survey had seventeen items, which included questions to elicit information or clarification of their perspectives. We performed the data analysis in SPSS by computing descriptive and inferential statistics. The findings showed that a majority of nurses were interested in returning to RN-BSN program. The students' reasons were both personal and career related, with personal reasons being more dominant. Most of participants held a diploma and midwifery and they had more than 2 years working experience since they completed diploma. There appears to be a need for a RN-BSN bridging program because most of study respondents are potential candidates for this program. This study provides information to nursing schools' management to provide opportunities and develop curriculums to meet the needs of these nurses. Nurses need to reflect on various strategies for incorporating their new knowledge into clinical practice.

Keywords: Bridging program, interests, nurses, nursing, university, United Arab Emirates.

Introduction

Around the world, RN-to-BSN programs have grown dramatically and many diploma nurses return to school for a BSN program. However, there is a concern among nurse leaders about lack of ideal nursing standardization and skill competencies. In the United Sates, for example, the Institute of Medicine outline the important of essential components in nursing education to prepare the future nurses (Conner and Thielemann, 2013). It is essential that nursing faculty members ensure that all program graduates are well prepared for practice in health care system and settings. It is also important to consider how to enhance RN-to-BSN programs and to evaluate their congruence with traditional BSN programs (McEwen, 2015). In addition, faculty members need to encourage and promote the success of the RN-to-BSN student (Hewitt 2016). Many research findings indicated that nurses with higher education experience improved patient outcomes, job satisfaction, less errors in medication treatments and low mortality rates in healthcare settings. For example, Aiken, (2014) and American Nurses Credentialing Center (2015) found that there would be better patient outcomes when BSN - prepared nurses are fully responsible for patient care. Their findings provide strong motivation for academic nursing programs at college or university levels to collaborate for creating a more highly educated workforce. For many years, the leaders in the field of nursing have encouraged Diploma, or Associate level nurses to pursue a Bachelor's of Science in Nursing (BSN) degree. Earning the BSN prepares nurses to offer patients a higher level of knowledge and skills. Within the last few years, the push to hire Bachelor's educated registered nurses has really gained momentum.

The nursing programs in the United Arab Emirates (UAE) are in the process of trying to inform prospective students about their RN-BSN bridging program. In the near future, the Bachelor's degree will be minimum level of education requirement for registered nurses (RNs). Other words, it is required by the Ministry of Health and Prevention (MoHaP) is emphasizing on a Bachelor degree as a minimal qualification for nurses to practice in UAE healthcare settings. The rationale is that entry to practice in UAE will be baccalaureate (BSN) degree because RN-BSN programs build on nursing knowledge and skills by providing education on research-based science, leadership and a liberal arts foundation. Becker (2017) indicated that a BSN program provides a stronger foundation in the humanities and sciences education. In addition, one of important factors for motivating nursing education is to increase the number of BSNs is that nurses with bachelor diploma degree are associated with patient outcomes and improvements (Aiken, 2014; Yakusheva, Lindrooth, & Weiss, 2014).

The United Arab Emirates (UAE) is a country located in Western Asia at the northeast end of the Persian Gulf and on the Arabian Peninsula. UAE is a federation of seven emirates of Abu Dhabi, Sharjah, Ajman, Dubai, Fujairah, Ras Al Khaimah (RAK), and Umm Al Quwain. In 2013, UAE's population was 9.2 million; 1.4 million are Emirati citizens and 7.8 million are expatriates (Malit & Youha, 2013). In UAE, a ruler governs each emirate and these emirates joint form the Federal Supreme Council. In addition, one of these rulers is the President of the UAE. According to data from 2016, 34.5% of adults in the UAE are clinically obese, with a Body mass index (BMI) score of 30 or more (World Health Organization [WHO], 2017). The life expectancy at birth is at 76.96 years. The main cause of death is cardiovascular disease, constituting 28% of total deaths in the UAE.

In the United Arab Emirates, the Ministry of Health and Prevention (MoHaP) is emphasizing on a Bachelor degree as a minimal qualification for nurses to practice in UAE. The RN-BSN program is designed pace the change demands of the global health care services and to align with international standards of nursing education. Therefore, this program will provide an opportunity to enhance nursing professional development and prepare future nurses for a broader scope of practice. This program will also provide the graduates to undergo higher education in nursing. The proposed bridge program in Nursing is a 60-credit program for registered nurses who have passed Diploma in Nursing and have a minimum of two years of clinical

experience. In addition, the curriculum of this RN-BSN program will bridge the gap between already acquired knowledge and skills in core nursing courses with the latest trends and advances in healthcare practice to improve the competencies essential for practicing as a professional nurse. A study conducted in the United States indicated that approximately 60 percent of RNs still practice with diploma or an associate's degree (The Institute of Medicine, 2010). From leading health care institutions and nursing organizations, propose entry to nursing practice should be at BSN degree (McEwen, White, Pullis, & Krawtz, 2012). Some studies indicate that RNs have problems in enrolling to a RN-BSN program. For example, many RNs have difficulty to join in an RN-BSN program related to negotiating multiple roles of work and study (Alonzo, 2009; Megginson, 2008). Understanding RNs' interest and reasons to join a RN-BSN bridging program will help determine ways to foster positive attitudes toward educational learning among nurses, and allow us to entice nurses to return to school (Altmann, 2011). By providing curriculums that are flexible and cater to the needs of students who are returning to study after a long time. In addition, it may identify steps to ensure the provision of education and quality nursing care. For these reasons, we conducted a survey of prospective RNs students seeking their opinion regarding pursuing a RN-BSN program as their further education.

An intensive literature review indicates that no study had been conducted to know the interests and reasons of diploma RNs undertake a RN-BSN bridging program in United Arab Emirates. The purpose of this study was to examine RNs interests and reasons of choosing a RN-BSN bridging program. More specifically, this study was to determine selected variables that influence the interest and the reasons for a RN-BSN bridging program and identify the most appropriate learning methods and mode for nurses who are interested in attending a RN-BSN bridging program. In addition, leaders in nursing education and service need to work collaboratively to support non-redundant pathways that lead to the baccalaureate nursing degree.

Method

We used a quantitative descriptive design to determine perceptions of interests and reasons of prospective nursing students (RNs) who will be enrolled in a RN-BSN program. The setting for the study was in some hospitals and clinics across UAE. The target population for the study was registered nurses who are working in different hospitals, clinics and community based healthcare in five different areas in the United Arab Emirates. They were from emirates of Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah, and Umm Al Quwain.

This study has been approved by the Research Ethics Committee of GMU Ajman before study implementation. We realize that protection of the participants was essential to be maintained throughout the study.

There are several ways of conducting a survey. The questionnaire used for survey had seventeen items, which included questions to elicit information or clarification of their perspectives. In our study, data was collected through web-based or online survey. Online surveys are becoming an essential research tool for a variety of research fields, including social, health, education and other researches. We found that a web-based survey is simpler, faster and cheaper. For data collection, an online survey tool was used to identify interest and reasons for prospective RN-BSN nursing students.

The practice nurse leaders collaborated with researchers identified potential diploma nurses who would be willing to return to school at a RN-BSN program during the recruitment period. During our online information, these nurse leaders help us to pass the information to the participants. In addition, all questionnaires used for survey distributed with potential nurse participants via personal email address. Online surveys were best suited for this study because the respondents were RNs who worked in different hospitals across UAE. An electronic inform consent with a link to the survey emailed to prospective respondents. Two hundred fifty of the surveys were distributed to potential respondents of which 135 questioners were returned.

In this study, we calculate the response rate that is 68 percent. All respondents

were required to have access to an internet connection in their computer. The research questions aligned with the utilization of a descriptive, design to identify their interests and reasons of joining in a RN-BSN bridging program. Online surveys are a reputable, efficient, and cost effective method for reaching participants at different areas or locations (George and Mallery, 2011). However, internet access was a possible limitation for online surveys. Hence inclusion criteria for this study required participants to be working in the hospital, thus the likelihood of limited access to internet was minimized. The RN-BSN interest survey consisted of open and close-ended questions including demographic information, checklists, rating and free response. In this study, our data entry process consisted of coding surveys and data entry and a member was responsible for the data entry and analysis. Once that was completed, this person has forwarded it to the team leaders for the final report and for compilation. One advantage of a web-based survey was the elimination of human coding errors because of automatic data coding by most programs used for online surveys. Quantitative data analysis was not performed in SPSS. We analyze the data manually by using excel sheet computing program. Since the data analysis did not use statistics, we only provide percentage and average in our findings. Microsoft Excel is often used by researchers to collect and analyze data. In addition, data management techniques can be implemented in Excel (Elliott, Hynan, Reisch, & Smith, 2006).

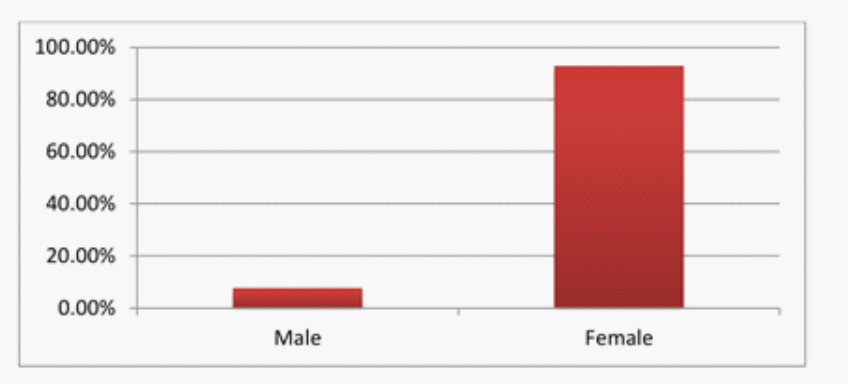
Results

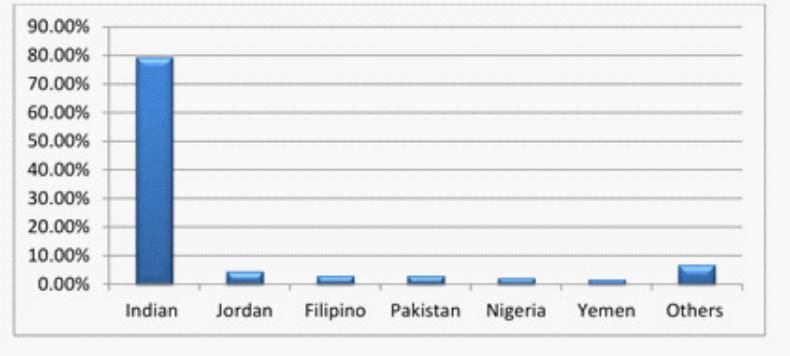
One hundred thirty-five (n=135) registered nurses worked in the hospitals and other health care setting across United Arab Emirates consented to participate in this study. This section presents the detailed survey findings from respondents (n=135) that were entered in database. Descriptive findings for each question follow, including bar charts. In our study, missing data are excluded from the graphs. All respondents' additional suggestions and comments are reported under question 17.

Respondents' characteristics

We found in our respondents' characteristics survey questions that the majority of nurse respondents identified themselves as female (92 percent) and only (7.40 percent) of respondents identified that they were men. This characteristic is not a surprising statistic because as anticipated, more women enter into the field of nursing profession than do men.

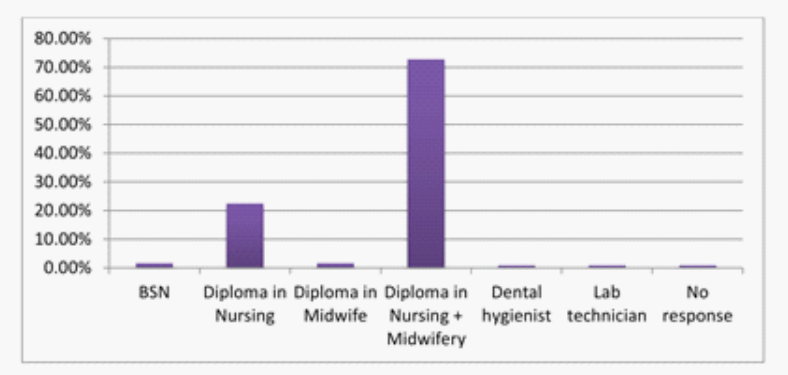
Our survey findings also indicate that the majority of those responding (79.25 percent) identified themselves as being Indian nationality. The other major ethnicity of the respondents declared was Jordan at 4.44 percent; Filipino and Pakistan were at 2.96 percent each: Nigerian nationality were (2.22 percent) and Yemen (1.48 percent). In addition, other nationalities of respondents were Bangladesh, British (UK), Cameroonian, Comoros, Emirati, Somali Sudanese and Syria at (0.74 percent) each. The vast of respondents are Indian group account for (79.25 percent) of all ethnicities.





The diploma/certificate in nursing

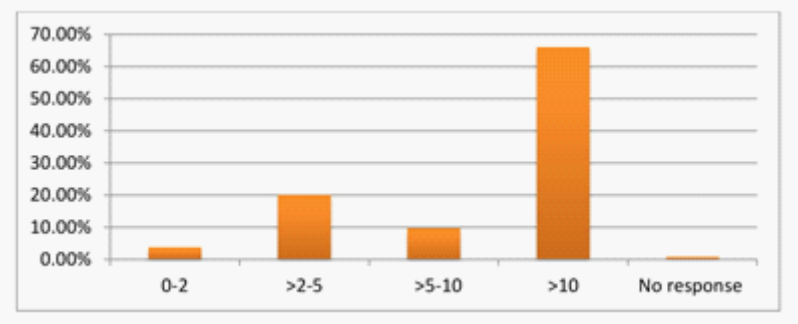
When study respondent were asked: "name of the diploma/certificate in nursing that they have", a larger percentage of study participants (72.59 percent) held a Diploma in Nursing + Midwifery. This data is followed by (23.70 percent) who earned a diploma in nursing. In addition, respondents with Diploma in Midwife were (1.48 percent). Others, Dental hygienist was at (0.74 percent) and Lab technician was at (0.74 percent). One respondent (0.74 percent) did not provide any response. From this finding, the majority of RNs respondents (72.59 percent) held a Diploma in Nursing or/and Midwifery. This finding also indicates that it would be easy for them to transition and pursuing RN-BSN bridging program.

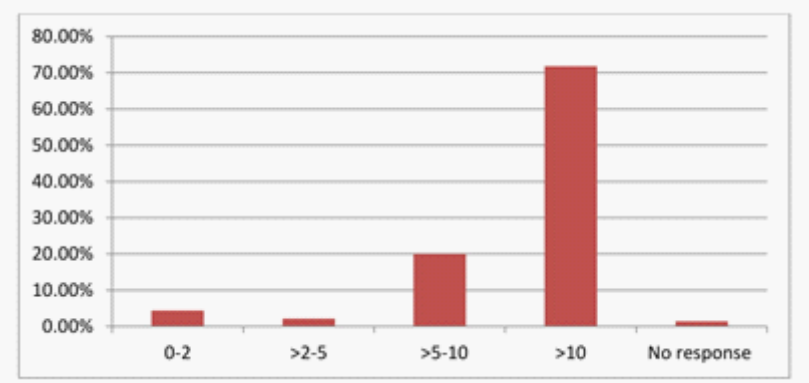


Number of years since completed Diploma and years of experience in nursing profession

In this number of years since completed diploma and years of experience in nursing section, we divide the number of years since completed diploma in 0–2, >2–5, >5–10, and >10. Our survey indicates that (65.92 percent) respondents have number of years since completed diploma more than 10 years. Respondent >2-5 were at (20.00 percent), >5-10 (9.62 percent), and (3.70 percent) of RN students reporting 0–2 years of years since completed Diploma. One respondent (0.74 percent) did not respond. There appears to be a need for a RN-BSN program as a majority of the RNs respondents would be potential feeders into the BSN bridging program.

Another question in this survey addressed years of the nurses had been practicing as a registered nurse in UAE. This section was also divided in 0–2, >2–5, >5–10, and >10 of number of years of experience in nursing. Survey findings indicate that (71.85 percent) respondents have number of years of experience in nursing more than 10 years, followed by respondent with >5–10 were at (20.00 percent), >2-5 at (2.22 percent). From total respondents, 4.44 percent of respondents have 0–2 years nursing experience. One respondent (0.74 percent) did not provide response. There appears to be a need for a RN-BSN program as a majority of the respondents would be potential candidates into the RN-BSN bridging program.

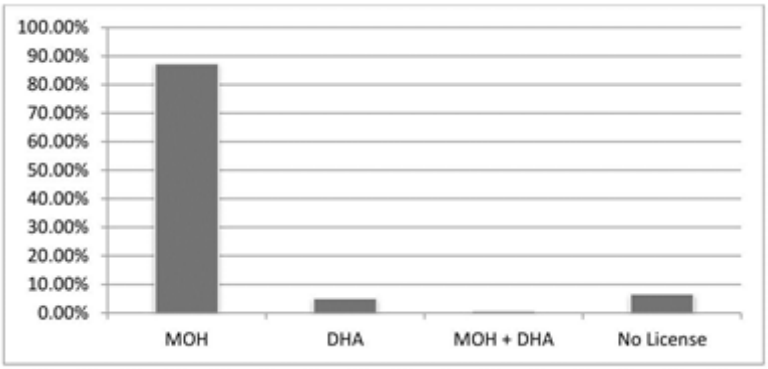


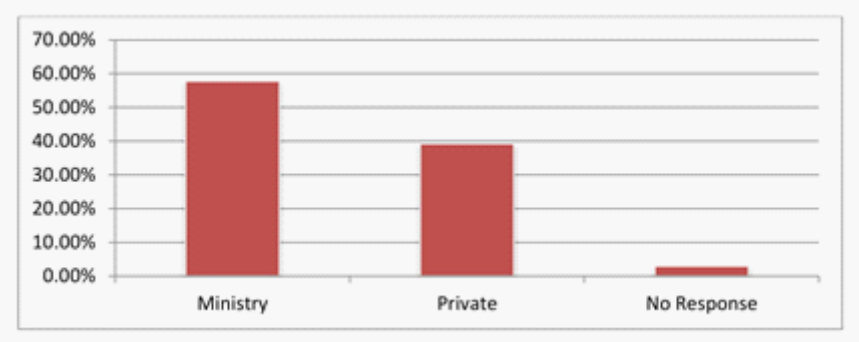


Nursing License and Working Place in the UAE

Our survey also asked about nursing license and working place in the United Arab Emirates. The survey finding shows that the majority of the respondents (87.40 percent) are currently pursuing Ministry of Health (MOH) RN license and only 5.18 of the participants hold DHA license. One respondent (0.74 percent) has both Ministry of Health (MOH) and Dubai Health Authority (DHA) licenses, and 6.67 percent respondents are without RN license. One respondent (0.74 percent) did not provide response. Finding indicates that the majority of respondents (93.32 percent) are eligible in pursuing a RN-BSN program

When study participants were asked about their working place in health settings currently, survey finding shows that (57.78 percent) of these nurse practicing with ministry of health care settings. Those who identified themselves work in private facilities were (39.25 percent). Another four (2.96 percent) did not respond the survey question. Between respondents who are working with ministry of health and private health care facilities are almost equal. Other words, percentages of both health settings are comparable.

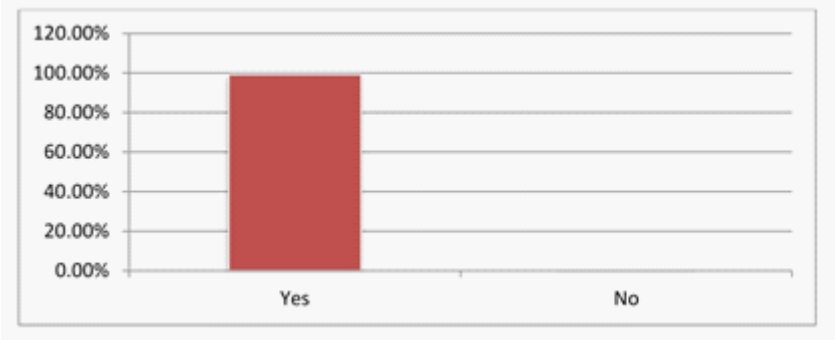


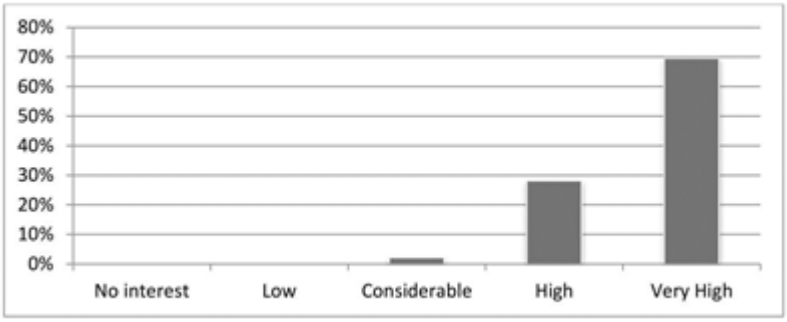


Interest in joining a bridging program in nursing

When participants were asked if they would be interested in pursuing or joining a RN-BSN bridging program, almost all or majority (99.26 percent) respondents said yes, they would be interested in joining a bridge RN-BSN. Only 0.74 percent respondents said no. From the surveys, majority of nurses stated they had interested in a RN-BSN bridging program.

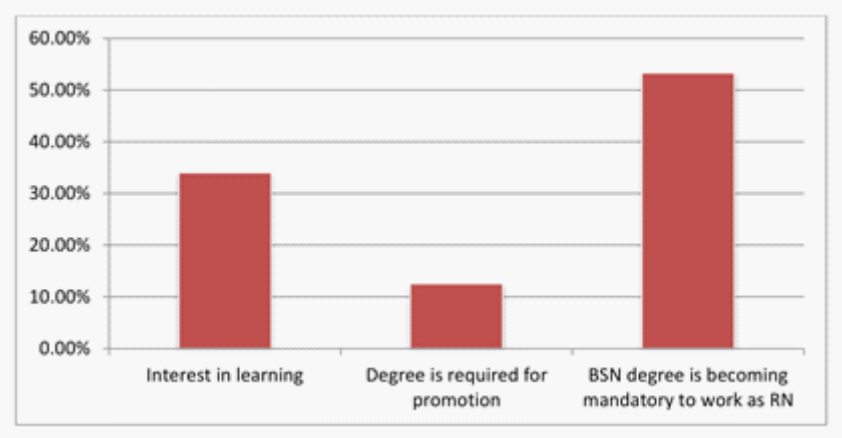
Survey also asked the level of interest in enrolling for the bridge program in nursing. Of the responses from RN participants, (69.62 percent) indicated have very high interest in joining the bridge program in nursing. 28.14 percent respondents said have high interest and (2.22 percent) said considerable in their level of interest. No respondent indicated that they had no or low interest in joining the program. This finding indicates that respondents have high to very high interest to transition in pursuing RN-BSN bridging program.





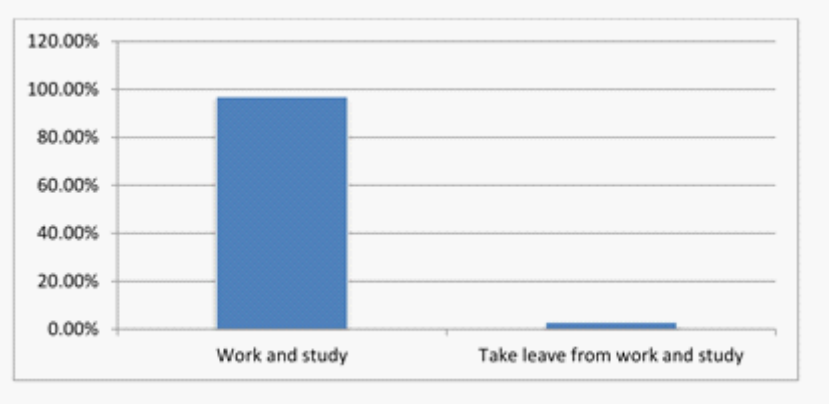
The reason for nurses to join RN-BSN bridge program

When we asked the reason to join RN-BSN bridge program: "Why do you wish to join the bridge program? 53.33 percent respondents said that BSN degree is becoming mandatory to work as RN. Respondents who said that they interest in learning were 34.07 percent. In addition, other respondents 12.59 percent said that BSN degree is required for their promotion.



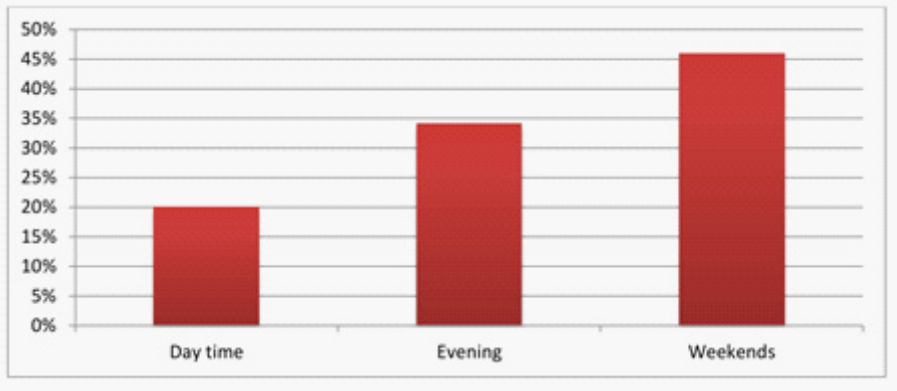
Plan regarding in attending the BSN-RN program

When in survey we asked "What is your plan regarding attending the program?" The majority of respondents (97.03 percent) stated they plan to attend work and study. Only (2.96 percent) respondents will take a leave from work to study RN-BSN bridging program.

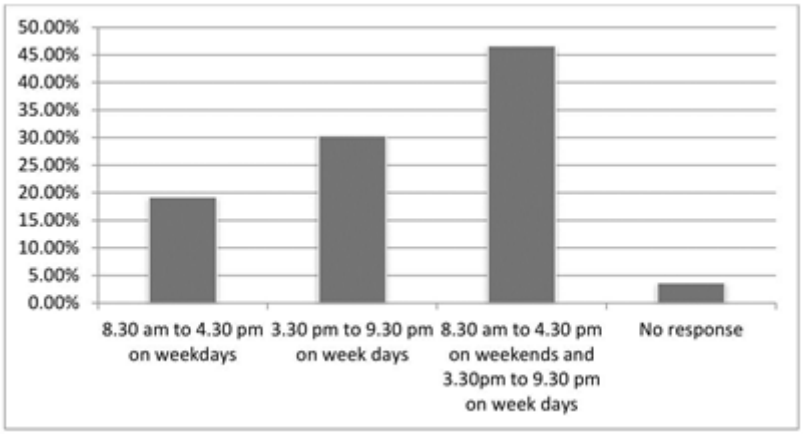


Time preference for attending classes

When participants were asked to rank of time preference or how they would like to attend RN-BSN, findings indicate that respondents preferred daytime (20.00 percent), in evening (34.07 percent), and in weekend (45.92 percent) to attend the program. The three percentages of time preferred are almost equal (daytime, evening, and weekends).

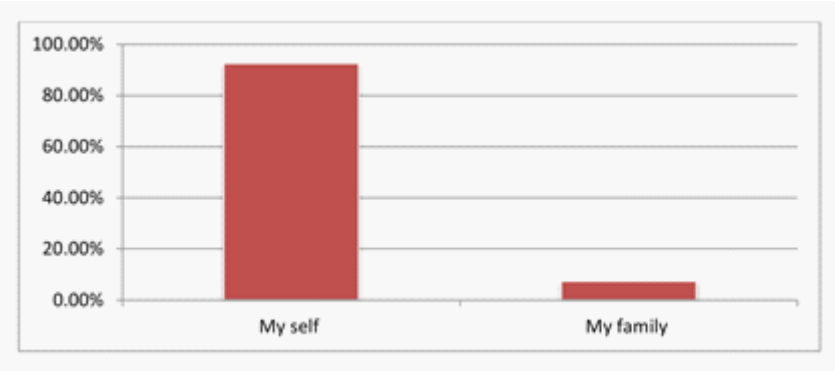


In addition, 46.67 percent respondents are interested in a combination of 8.30 am to 4.30 pm on weekends and 3.30pm to 9.30 pm on weekdays to attend. It was followed by 30.37 percent of respondents who like to attend classes between 3.30 pm to 9.30 pm on weekdays. Only (19.25 percent) preferred their attendance between 8.30 am to 4.30 pm on weekdays. There were (3.70 percent) respondents did not respond. Time slot for attending the classes are almost equal to take their RN-BSN program the classes.



Tuition fees payment

When come to question, "Who will pay your fees? The majority of respondents (92.59 percent) said that they would pay their tuition fees themselves. Only (7.40 percent) of respondents said that their family will pay their tuition fees at RN-BSN program.

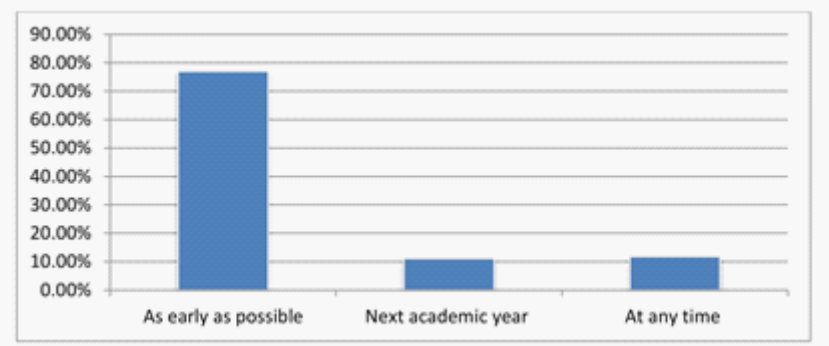


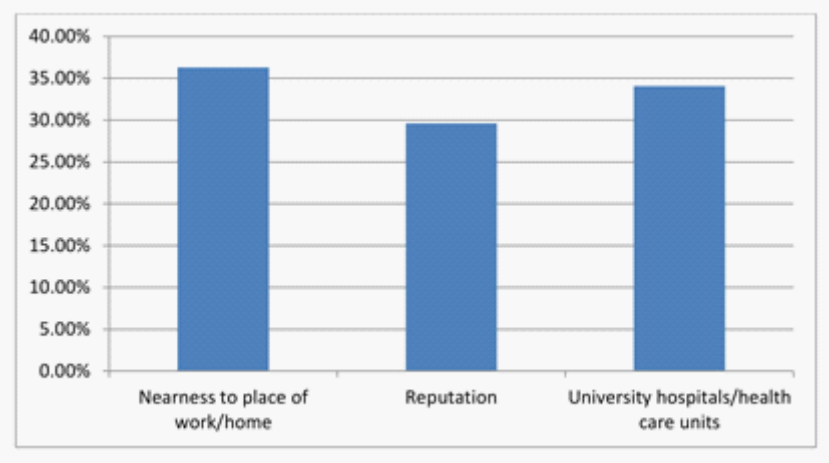
Time preferences to join RN-BSN bridging program

Survey question asked three aspects of joining time: as early as possible, next academic year, at any time. The majority of respondents (77.03 percent) said that they would join the RN-BSN program as early as possible. Both who responded next academic year and at any time were equal: next academic year (11.11 percent) and at any time (11.85 percent). This finding indicates that they will join RN-BSN program as early as possible.

The reason of choosing university for your further studies

Respondents were asked the reason of choosing or joining University, and nearly half (36.29 percent) stated that about nearness to place of work/home. A similar percentage was accounted for university hospitals/health care units (34.07 percent) and university reputation (29.62 percent). Three of these percentages are comparable. Respondents not only live close to the university from work/home but they also have the reason because of university hospitals/health care units and the reputation of the university.





Discussion

Registered Nurses (RNs) wishing to return to school would be valuable for professional nursing education (Sarver, Cichra, & Kline, 2015). Much has been reported regarding the need for a nursing education transition program in nursing profession (American Association of Colleges of Nursing, 2013); from a diploma nursing to the BSN program (Kumm et al., 2014; Pittman, Kurtzman, & Johnson, 2014). RN-BSN educational programs build upon foundational skills obtained in a diploma or an associate degree in nursing because both program aptly cover the provider of care role of the registered nurse. The RN who returns to school (BSN) has unique characteristics that need be considered if the educational experience is to be positive. Allen and Armstrong (2013) highlight that the main values of the RN-BSN program reveal a nursing faculty member who is concerned to development of education to transition the diploma or associate degree graduate to professional nursing practice without repetition of content and learning activities. In the united states, the proportion of RNs with a BSN increase to 80 percent by 2020 (The Institute of Medicine, 2011) and registered nurses (RNs) with an associate's degree or diploma are among the fastest growing groups of Bachelor of Science in nursing (BSN) students (Leonard, 2003). However, a current study indicated that RN-BSN programs hold the second lowest average graduation rate of US nursing programs (Perfetto, 2019). Sarver, Cichra, and Kline (2015) indicated that the opportunity for Registered Nurses to identify challenges, benefits, and motivators to return to a school is an example of nurse leaders advocating for RNs who seek a higher educational nursing program.

Responding to a current healthcare demand, the nursing profession is actively seeking to increase the number of prepared nurses with BSN holders. Our study findings indicate that the majority of respondents identified themselves as women and only few of respondents are men. This is not a surprising finding because more female nurses are working in the field of nursing than

do male in health care settings in the United Arab Emirates. More women enter into the field of nursing than do men. The vast of respondents are Indian group account of all nationalities. The other major ethnicities were Jordan, Filipino and Pakistan. Other nationalities were as Nigeria, Yemen, Bangladesh, British (UK), Cameroonian, Comoros, United Arab Emirati, Somali Sudanese and Syria. In addition, the majority of respondents or a larger percentage of participants held a Diploma in Nursing plus Midwifery. Respondents who earned a diploma in nursing alone follow it. Our findings indicate that there is a need for a RN-BSN bridging program as a majority of respondents would be potential candidates into this RN-BSN program. Survey findings also indicate that more than half percentage of total respondents have more than 10 years since they completed diploma. This finding indicates also that it would be easy for them to transition and pursuing RN-BSN bridging program. Majority of RNs as survey respondents have more than two years of experience in nursing. From them, also the majority of them have more than 10 years working as nurses that respondents are eligible in pursuing a RN-BSN program. Also, the majority of the respondents are currently pursuing MOH RN license. It is followed by some participants hold DHA license and one respondent has both MOH and DHA licenses. Half of survey respondents were practicing or working with ministry health care settings and half those who identified themselves work in private facilities. Between respondents who are working with ministry and private health care facilities are almost equal or both percentages are comparable. According to the Institute of Medicine (2010), the willingness of RNs to increase their education will be an important component of successfully increasing the percentage of BSN degree. According to Cipher, Mancini, and Shrestha (2017), younger students who received financial aid and had a previous BSN degree reflected the demographic profile associated with the highest likelihood of graduating and graduating sooner.

Most of respondents had planned to attend work and study. Very less of respondents will take a leave from work to study RN-BSN bridging program. This indicates that RNs will stay working during attending RN-BSN bridging program. If it is related to preferred time for attending classes, the three percentages of time preferred (day time, evening, and weekends) are almost equal to. Respondents like attend RN-BSN bridging program at daytime, in evening, and in weekend were almost the same percentage. Percentage of convenient time slot for attending the classes are almost equal among three time slots to attend RN-BSN program the classes. Almost half of respondents are interested in a combination of 8.30 am to 4.30 pm on weekends and 3.30pm to 9.30 pm on weekdays to attend. Some respondents like to attend between 3.30 pm to 9.30 pm on weekdays and less of them preferred their attendance between 8.30 am to 4.30 pm on weekdays. Some barriers for RNs who return to school (BSN) program include scheduling of coursework and fear of failure (Davidson, Metzger, Lindgren, 2011). In addition, the stress an RN feels when returning to school can be addressed by using a combined approach that involves faculty and student working together (Davidhizar, Gigen, & Reed, 1993).

For tuition fees, the majority of RNs will pay their tuition fees themselves. The second, they said that their family would pay their tuition fees at RN-BSN program. Some respondents concerned about this tuition fees and asked that tuition fees will be affordable for them. If it is related to joining time, the majority of nurse respondents indicated that they preferred to join the RN-BSN program as early as possible. This indicates that RNs prospective students wanted to join RN-BSN program as early as possible if programs are available to them. Primary RN-BSN completion barriers and challenges were work-life balance and economic issues (Duffy et al., 2014). According to Anbari (2015), illustrating what the RN-BSN transition looks like is important as organizations move forward to increase the number of employed BSNs and schools of nursing move to improve their RN-BSN programs.

The majority of nurses in this survey stated they had interested in a RN-BSN bridging program. They would be interested in pursuing or joining a RN-BSN bridging

program, almost all of respondents agreed that they would be interested in joining a bridge RN-BSN. The level of interest in enrolling for the bridge program in nursing is between very high and high. The majority of respondents indicated that they have very high and high interest in joining the bridge program in nursing. It indicates that respondents have high to very high interest to transition in pursuing RN-BSN bridging program. Some reasons for RNs to join the RN-BSN bridge program. Almost half of them indicated that BSN degree is becoming mandatory to work as registered nurse. Similarly, they have interest in learning and other respondents said that BSN degree is required for their promotion in the hospitals. RN–BSN students described their pursuit of a BSN as a journey of being and becoming a professional. In addition, the reason of choosing or joining University, nearly half stated that about nearness to place of work or home. A similar percentage was accounted for university hospitals or health care units and university reputation. Three of these percentages are comparable and RNs respondents not only live close to the university from work/home but they also have the reason because of university hospitals/health care units and the reputation of the University.

Our findings indicated that nursing profession remains a career of choice for young RNs entering university in the UAE. The study findings could help university recruiters and deans, or head of nursing department to keep the nursing viable and creative that it will be implemented and evaluated in recruitment process. We need to focus on this issue as we develop a BSN program with a current generation where multiple changes appear inevitable during their career. Nursing program in universities must focus on this as they develop programs for a generation where multiple changes of career appear inevitable during their lifetime. The nursing profession needs to look at career pathways after graduation that provides these challenges within nursing profession. Some nursing scholars have recommended important ways and methods regarding RN-BSN bridging program. As prospective diploma students return to school to obtain a BSN degree, innovative ways need to be found to support them. According to Davidson, Metzger, and Lindgren (2011), with input from nursing leaders and nurses in the community, data showed that support related to program, technology, and social from other peers encouraged the RNs to 'stay the course,' and completed the requirements to graduate. With United Arab Emirates emphasis on increasing BSN nurses, the role of administrative staff and nurse educator is essential of promoting lifelong learning. Therefore, it is an ideal to provide a way for advising and mentoring nurses to return to BSN programs (Romp et al., 2014). According to Gillespie and Langston (2014), Bachelor Science in nursing progression is closely related to a relationship among several factors such as personal, work, and educational issue. Therefore, determining the best ways to inspire RNs to pursue a Bachelor Science in Nursing (BSN) is the challenge for nursing educational programs.

Conclusion

To conclude, there appears to be a need for a RN-BSN program as a majority of the RNs respondents would be potential feeders into the BSN. Based on our research findings, prospective students of RN-BSN program are encouraged to assess their interest and reasons as well as their motivation to return to nursing school. They also need to be aware of the importance of the right program, the right time and the right place to attend a BSN program. Nursing institutions and academicians need to evaluate their nursing programs to address the possible barriers faced by these students to make this nursing educational transition more success. Describing what it looks like RN's transition to BSN is important as the organization moves forward to increase the number of BSNs workers and the School of nursing movements to improve RN's to BSN programs. These studies can provide an implementation of institutional strategies, such as curriculum improvement, academic collaboration as well as tuition reimbursement.

It is essential that nursing schools, deans, head, recruiters, and entire faculties need to provide opportunities for RNs students

to develop skills in problem solving and their therapeutic communication. One of limitations of this study is that situational and busy working days of prospective RNs who will be potential students attend a RN to BSN program is limited. Another limitation is that samples of this study is only limited. Therefore, a study with larger samples from several and multiple working areas of the RNs would increase the reliability and validity of the results.

In addition, BSN programs and faculty members are encouraged to evaluate their programs annually to address the barriers and facilitators experienced by students during their studies. This regular program evaluation will also make their BSN education transitions more successful and meaningful. Further studies are needed to explore RNs barriers or challenges and facilitators for RN-BSN bridging program completion. In addition, qualitative research of the future that can define factors that support and restrict the retention of RN-BSN students is required. Opinions and perceptions of students can be explored through interviews and conversations and it may provide more results that are comprehensive.

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The Effect of Slow Deep Breathing Exercise on Headache and Vital Sign in Hypertension Patients

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Abstract

Prevalence hypertension was estimated 1.13 billion people in the world and 2.027.006 (20.0%) people in DKI Jakarta. Headache was a common symptom related to high blood pressure levels. Slow Deep Breathing Exercise was non pharmacological therapy to reduce consumption of oxygen, metabolism, frequency of respiration, frequency of heart, muscle tension and blood pressure. This research was a pre-experimental one group pre-test post-test design and the respondents performed slow deep breathing exercise fourth time in one day during fourth days. Before and after intervention, the respondents measured vital sign and assessed headache scale with subjective and objective (a numerical scale 1-10). The number of samples in this study were 30 respondents who were selected by probability random sampling and were included in the inclusion and exclusion criteria. Research time December 2019-January 2020 at UKI General Hospital and Cawang District Health Center, East Jakarta. The results showed differences before and after Slow Deep Breathing Exercise on the decrease in headache scale with p-value = 0.000 and on the decrease in blood pressure with p-value = 0.000 and on the pulse rate of 0.014, breathing frequency 0.008 and temperature 0.000 (<0.001). Before intervension, patients feels headache on 7 scale and after intervention, respondents felt no headache on 0 scale. Conclusion are Slow Deep Breathing Exercise have an effect to reduce headache scale and vital sign for four days . The suggestion for the nurse teachs Slow Deep Breathing Exercise to hypertensive patients so that patients can do these exercises at home as an independent exercise.

Keywords: Headache, hypertension patients, slow deep breathing exercise, vital signs.

Introduction

Non-communicable diseases are the leading cause of death globally and one of the major health challenges of the 21st century (WHO, 2018). Non-communicable disease are estimated to account for 71% of the 57 million global death which consisting of cardiovascular disease (31%), cancers (16%) and chronic respiratory diseases (7%) and diabetes (3%) (WHO, 2018).

Cardiovascular disease is the number one cause of death globally (AHA, 2019). In 2012, Cardiovascular disease killed 17,5 million people and the equivalent of every 3 in 10 deaths. One of these 17 million deaths of a year, over half 9,4 million are caused by complications in hypertension. Hypertension is a risk factor for coronary heart disease and the single most important risk factor for stroke. It is responsible for at least 45% of deaths due to heart disease and the least 51% of the deaths due to stroke (IFPMA, 2016). Hypertension is a persistent elevation of systolic blood pressure (TDS) at a level of 140 mmHg or more and diastolic blood pressure (TDD) at a level of 90 mmHg or more (Black & Hawks, 2014).

Prevelence hypertension was estimated 1.13 billion people worldwide and living in low-and middle-income countries (WHO, 2019). One of the chronic diseases in the world that causes 9.4 million deaths annually (WHO, 2013 in Dendy, Helwiyah, & Urip, 2018). Asia is the world's largest and most populous continent with approximately 4.3 billion people, hosting 60% of the world's current human population, and has a high growth rate (Chun et al., 2013). In 2013 there were 65.048.110 (25.8%) people suffering from hypertension with an Indonesian population more than 252 million people where the elderly age group had more hypertension with a prevalence of 57.6% compared to other age groups (RISKESDAS, 2013). The prevalence of hypertension sufferers in DKI Jakarta province is 2.027.006 (20.0%) of people affected by hypertension (RISKESDAS, 2013).

Hypertension that is not handled properly can lead to coronary heart disease, heart failure, stroke, kidney failure, hypertension retinopathy and blindness so that patients open a nursing management that can deal with hypertension (Wijaya & Putri, 2013).

In a sample of 11.710 hypertensive patients, reported that headache was a common symptom related to high blood pressure levels. 31% of patients with untreated severe hypertension complained of headache compared with 15% of treated hypertensive patients and controls without hypertension (Cortelli et al., 2016).

Non pharmacological therapy that must be carried out by hypertension sufferers is controlling food intake and sodium, losing weight, limiting alcohol and tobacco consumption, doing sports training, foot reflexology therapy and Slow Deep Breathing Exercise (Smeltzer & Bare, 2011; Liota, Dwi, & Tulus, 2018). Slow Deep Breathing Exercise is breathing technique with frequency of respiration less than 10 time per minute and long inhalation phase (Tarwoto, 2012). Benefits of Slow Deep Breathing Exercise are reduce level of pain and stress, to control of tension and fear. Slow deep breathing exercise can reduce consumption of oxygen, metabolism, frequency of respiration, frequency of heart, muscle tension and blood pressure (Kozier et al., 2010). Pain is a condition that affects a person whose existence is known only if that person has experienced it (Aziz & Musrifatul, 2014).

The results of research conducted by Mulyadi, Supratman, and Yuni (2015) of 36 respondents of hypertension in Puskesmas Baki Sukoharjo found a significant influence in the administration of Slow Deep Breathing Exercise therapy on reducing the intensity of headache in hypertensive patients with p-value = 0.001 (<0.5) . This is evidenced by the intervention of headache intensity before being on a medium scale and headache intensity intervention was done on a mild scale (Mulyadi, Supratman, & Yuni, 2015).

The results of another study conducted by Putu, Ayu, and Ketut (2016) on 28 respondents of hypertension in Puskesmas I East Denpasar found significant influence in the administration of Slow Deep Breathing Exercise therapy in reducing systolic blood pressure and diatolic blood pressure in patients with p-value = 0.000 (<0.001).

The different between privous study and

this study that privous study show short term to perform slow deep breathing exercise. But this study show long term to perform slow deep breathing exercise so that more accurate for the results. Privous study showed a little respondent but this study show many respondent to do this study so that the results more accurate and variated.

This research was conducted at East Jakarta UKI General Hospital and Cawang Village Health Center, East Jakarta. Researchers conducted a study at the Jakarta Public Hospital because of the phenomenon of a high incidence of 1,066 patients (January-December 2018). The study was also conducted with the Cawang Village Health Center in East Jakarta because the incidence of hypertensive patients who visited was 778 (November 2019-January 2020).

This research was conducted with 30 respondents of hypertension patients who experience headaches. The respondents were taught slow deep exercise four times a day for four consecutive days. Data were taken on a scale of headache and vital signs (blood pressure, pulse, respiration and temperature) before and after the intervention.

The phenomenon of researcher observations that occur in UKI public hospitals and Cawang UKI health centers is the treatment of hypertensive elderly patients using only hypertension medication and analgesic medication so that headaches reappear when patients do not use these drugs. Therefore, researchers are interested in conducting research on Reduce The Scale Of Headache And Vital Signs With Slow Deep Breathing Exercise In Hypertension Patients In East Jakarta. The purpose of this study was to determine efforts to administer Slow Deep Breathing Exercise to reduce the scale of headache and vital signs in hypertensive patients in East Jakarta.

Method

This research is a pre-experimental research with one group pre test design and post test design. This research was conducted by measuring vital signs (blood pressure, pulse, respiration and temperature) and assessing the headache scale subjectively and objectively (using a numerical scale 1–10) in hypertensive patients before being given a Slow Deep Breathing Exercise and comparing it with a scale pain and the results of vital signs (blood pressure, pulse, respiration, temperature) hypertensive patients after the Slow Deep Breathing Exercise for 4 days. Research respondents conducted slowly in training four times a day. This research was conducted for 4 days when inpatients at the RSU UKI East Jakarta and outpatients in Puskesmas Kelurahan Cawang, East Jakarta were then visited at the patient's home for 4 days. After the data is collected, the researcher enters the data into the master table and then tests the normality of the data. For univariate analysis using SPSS frequency and bivariate analysis pre-test & post-test using the Wilxocon test. For analysis data to show before and after intervention for headache scale, blood pressure, pulses, respiration frequency and temperature.

The population of this study was 1,844 hypertensive patients who experienced headaches who visited the UKI General Hospital and the Cawang District Health Center in East Jakarta. The sampling technique in this study is probability random sampling which the researcher took responden randomly. The inclusion criteria were only hypertension patients who experienced headaches, patients who were hospitalized in UKI General Hospital and patients who visited the health center at Cawang Village Health Center. Exclusion criteria were patients who were not willing to do Slow Deep Breathing Exercise 4 times a day in 4 days and and patients who did not routinely take hypertension medication. The sample size in this study used a paired hypothesis test formula of average difference, totaling 30 hypertension patients who experienced headaches. The formula to get 30 hypertension patients from the rule of thumb (Sastroasmoro & Ismail, 2011) which between 5–50 times the number of independents.

The first day of the study respondents will be asked to scale the headache and taken vital signs (blood pressure, pulse, respiration and temperature). After that, respondents were taught slow deep exercise techniques. Then the respondent again took a headache scale

and vital signs. The first day, respondents performed slow deep breathing exercise 4 times in a day.

Steps The slow deep exercise technique consists of adjusting the position of the patient by sitting or sleeping, the patient's hands are placed above the stomach, the patient inhales through the nose while developing the stomach, hold breath for three seconds then the breath is released slowly through the mouth while feeling the stomach move down (deflate the stomach).

The second to fourth day, respondents did the same thing accompanied by the researcher and the headache and vital signs data before and after the intervention was still taken by the researcher. The second day to fourth day, respondents performed slow deep breathing exercise 4 times in a day.

The fourth day, researchers still took the scale of the level of headaches and vital signs before the intervention. After that, respondents do slow deep breathing exercises. Then, the researchers took data on the headache level scale and vital signs after intervention as a post test.

To measure the headache scale, researchers used a 0–10 headache scale. Level 0–1 if there is no headache. Level 2–3 if the respondent feels mild headache. Level 4–5 if the respondent feels moderate headache. Level 6–7 if the respondent feels severe headache. level 8–9 if the respondent feels very severe headaches. Level 10 respondents felt unbearable headache. Headache scale data is taken subjectively and objectively. Subjective data is taken when the respondent mentions a headache level scale. Objective data taken from data on blood pressure, pulse, respiration and temperature and facial expression of the respondent. If the respondent's blood pressure is below 90/60 mmHg, the respondent's is hypotensive. Blood pressure below 120/80 mmHg, it is said to be normal blood pressure. When systolic blood pressure between 120–139 and diastolic between 80–89 mmHg, it is said prehypertension. If systolic blood pressure is between 140–159 mmHg and diastolic between 90–99 mmHg, it is said to be grade 1 hypertension. If systolic blood pressure is more than and equal to 160 mmHg and diastolic is more than and equal to 100 mmHg, it is said to be grade 2 hypertension.

If the pulse is less than 60 times per minute, it is said bradycardia. If the pulse rate is between 60–100 times per minute, it is said to be normal. If the increase in pulse rate exceeds 100 times per minute, it is said tachycardia.

If the respiratory frequency is less than 12 times per minute, it is said bradiapnea. If the respiratory frequency is 12–20 times per minute, it is said to be normal. If the respiratory frequency is more than 20 times per minute, then say takiapnea. When the body temperature between 36–37.4, it is said to be normal body temperature. If the body temperature is above or equal to 37.5, it is said to be fever or hyperthermia. The variables studied in this study were headache scale and vital signs including systolic and diastolic blood pressure, pulse, respiration and temperature as the dependent variable and deep breathing relaxation techniques as independent variables. The instrument used in this study was the mercury blood pressure meter as a tool to measure blood pressure, a wristwatch to measure pulse and pain scale 1–10 and an observation sheet to collect characteristic data along with the results of blood pressure measurements of respondents. Respondents measured their vital signs in a seated position and then were given exercises to breathe relaxation techniques for 15 minutes.

Slow Deep Breathing Exercise is done four times a day for 4 days. The last day of slow deep breathing exercise measurements of vital signs and assessing the scale of headache to assess the scale of headache after exercising deep breathing relaxation techniques in the afternoon. After the data is collected, the researcher enters the data into the master table and then tests the normality of the data.

For univariate analysis using SPSS frequency and bivariate analysis pre-test & post-test using the Wilxocon test. Univariate analysis consists age, gender job, blood pressure systolic and diastolic, pulses, respiratory and temperature. Bivariate analysis consists p-value before and after intervention for scale headache, blood pressure systolic and dyastolic, pulses, respiratory, temperature and the meaning of Slow Deep Breathing

Exercise in Hypertension Patients From Day 1 to Day 4.

Results

Tabel 1 Demographic Characteristic (n=30)

Characteristic	Frequency	%
1. Age		
26–45	8	26.7
46–65	17	56.7
Above 65	5	16.6
2. Gender		
Man	11	63.3
Woman	19	36.7
3. Job		
Working	9	30
Does not work	21	70

Tabel 2 Clinical Information

Hypertension Characteristics	Before Slow Deeep Breathing Intervention		After Slow Deeep Breathing Intervention	
	Frequency	%	Frequency	%
1. Systolic				
Normal	-	-	17	56.7
Prehypertension	3	10	11	36.7
Hypertension Stage 1	10	33.3	2	6.6
Hypertension Stage 2	17	56.7	-	-
2. Dyastolic				
Hypotension	-	-	1	3.3
Normal	1	3.3	23	76.7
Prehypertension	8	26.7	4	13.3
Hypertension Stage 1	11	36.7	2	6.7
Hypertension Stage 2	10	33.3	-	-
3. Pulse				
Normal	22	73.3	29	96.7
Tachycardia	8	26.7	1	3.3
4. Respiratory Rate				
Normal	22	73.3	27	90
Tachyapnea	8	26.7	3	10
5. Temperature				
Normal	27	90	30	100
Hyperthermia	3	10	-	-
6. Scale of Headache				
Scale 0 (No pain)	-	-	16	53.3
Scale 1 (No pain)	-	-	10	3.3

Scale 2 (Mild Pain)	-	-	3	1
Scale 3 (Mild Pain)	3	10	1	3.3
Scale 4 (Moderate Pain)	5	16.7	-	-
Scale 5 (Moderate Pain)	4	13.3	-	-
Scale 6 (Great pain)	5	16.7	-	-
Scale 7 (Great pain)	8	26.7	-	-
Scale 8 (Very great pain)	4	13.3	-	-
Scale 9 (Very great pain)	1	3.3	-	-
Scale 10 (The most intense pain)	-	-	-	-

Table 3 Headache And Vital Sign Score Before And After Intervention

Variable	P-Value
1. Difference in Scale of Headache Before and After Slow Deep Breathing Exercise Interventions	0.000
2. Systolic Blood Pressure Differences Before and After Slow Deep Breathing Exercise Interventions	0.000
3. Diastolic Blood Pressure Differences Before and After Slow Deep Breathing Exercise Interventions	0.000
4. Difference in pulse rate before and after the intervention of Slow Deep Breathing Exercise	0.014
5. Difference in the Frequency of Breathing Before and After Intervention of Slow Deep Breathing Exercise	0.008
6. Temperature Difference Before and After Slow Deep Breathing Exercise Intervention	0.000

Table 4 Meaning of Slow Deep Breathing Exercise in Hypertension Patients From Day 1 to Day 4

	Hari 1	Hari 2	Hari 3	Hari 4
Subjective data:				
Scale of Headache After Slow Deep Breathing Exercise	0.000	0.000	0.000	0.000
Objective Data:				
Systolic Blood Pressure After Slow Deep Breathing Exercise	0.007	0.007	0.001	0.000
Diastolic Blood Pressure After Slow Deep Breathing Exercise	0.012	0.180	0.005	0.000

1. Univariate Analysis

Based on table 1, the majority of respondents aged 46–65 years were 17 people (56.7%) and the minority of respondents aged over 65 years were 5 people (16.6%). For the majority of the sexes there were 19 female respondents (36.7%) and the minority of the male sex were 11 people (63.3%). For job characteristics, the majority of hypertensive respondents do not work as many as 21 people (70%) and the minority of respondents work as many as 9 people (30%).

According to Table 2, it was found that before the Slow Deep Exercise intervention the majority of systolic blood pressure in stage 2 hypertension were 17 respondents (56.7%), diastolic blood pressure in stage 1 hypertension were 11 respondents (36.7%), the majority of normal pulse was 27 respondents (73.3), the majority of normal respiratory frequency was 22 respondents (73.3%), the majority temperature was normal as many as 27 people (90%) and the majority of headache scales on a scale of 7 (severe pain scale) were 8 people (26.7%). After the Slow Deep Exercise intervention, the majority of

systolic blood pressure in normal was 17 respondents (56.7%), the majority of diastolic blood pressure was normal in 23 respondents (76.7%), the majority of normal pulse was 29 respondents (96.7%), the frequency of breathing was majority in as many as 27 respondents (90%), the majority of normal temperatures were 30 people (100%) and the majority of the headache scale was on a scale of 0 (no headache) of 16 respondents (53.3%).

2. Bivariate Analysis

Bivariate analysis consists p-value before and after intervention for scale headache, blood pressure systolic and dyastolic, pulses, respiratory, temperature and the meaning of Slow Deep Breathing Exercise in Hypertension Patients From Day 1 to Day 4 using the Wilxocon test.

Based on Table 3, there are differences in the scale of headache before and after the Slow Deep Breathing Exercise intervention with a p-value of 0.000 (<0.001). Based on Table 4, there are differences in systolic and dyastolic blood pressure before and after the intervention of Slow Deep Breathing Exercise with a p-value of 0.000 (<0.001). There is a difference in the pulse rate before and after the Slow Deep Breathing Exercise intervention with a p-value of 0.014 (<0.001). There is a difference in the respiratory rate before and after the Slow Deep Breathing Exercise intervention with a p-value of 0.008 (<0.001). There is a temperature difference before and after the Slow Deep Breathing Exercise intervention with a p-value of 0.000 (<0.001).

Based on table 5 showed that the significance of the Slow Deep Breathing Exercise intervention is on the third day where from the subjective data the headache scale p-value = 0.000 (<0.001) and objective data on systolic blood pressure p-value = 0.0001 (<0.001) and diastolic blood pressure with p-value = 0.005 (<0.001).

Discussion

This study found that slow deep breathing exercise could decreased headache scale. The Researcher assume slow deep exercise can reduce the scale of headache because slow deep exercise can reduce blood pressure, relax tense muscles around the neck and head, diverting attention from headaches so that patients can calm down and not grimace in pain in the head.

This is evidenced by the Slow Deep Breathing Exercise widely used to reduce chronic pain. Inhale deeply can relax a group of toto in sequence and focus attention on the differences in feelings experienced between when the muscle groups relax and when the muscles are tense (Kozier et al., 2010).

This was consistent with previous study conducted by Mulyadi, Supratman, and Yuni (2015) on 36 respondents of hypertension in Puskesmas Baki Sukoharjo found a significant influence in the administration of Slow Deep Breathing Exercise therapy on reducing the intensity of headache in hypertensive patients with p-value = 0.001 (< 0.001). This is evidenced by the intervention of headache intensity before being on a medium scale and headache intensity intervention was done on a mild scale (Mulyadi, Supratman, & Yuni, 2015).

The different between privous study and this study that privous study show short term (only one day) to perform slow deep breathing exercise. But this study show long term (fourth day) to perform slow deep breathing exercise so that this study produced the results more accurate than provious study. This study found that slow deep breathing exercise could decreased systolic and diastolic blood pressure. Researchers argue that slow deep breathing exercises make the heart work optimally so that there is no decrease in cardiac output and blood pressure returns to normal.

This was consistent with previous study conducted by Putu, Ayu, and Ketut (2016) on 28 hypertension respondents at the East Denpasar Health Center I found a significant influence in the administration of Slow Deep Breathing Exercise therapy to decrease systolic and diatolic blood pressure in hypertensive patients with p-value = 0.000 (<0.001).

This study found that slow deep breathing exercise could decreased pulses. researchers believe that slow deep breathing exercise can reduce blood pressure back to normal so

that the pulse returns to normal too. This was consistent with Kozier et al. (2010), Slow Deep Breathing Exercise can reduce heart frequency, muscle tension and systolic and diastolic blood pressure.

This was consistent with previous study which conducted by Arif, S.U., & Agis, T. (2019) on 25 hypertension respondents at Kembaran Timur Purwokerto health center which found there was a different decreased pulses before and after slow deep breathing exercise. Before slow deep exercise, mean's pulse 90,16x/minute and after slow deep breathing, mean's pulses 87,84x/minute.

This study showed that slow deep breathing exercise could decreased respiratory rate and temperature normal. Researchers argue that slow deep breathing exercise can make fill the lungs with oxygen so that reduce shortness of breath and make respiratory rate to be normal. Slow deep breathing exercise can relax muscles so that make temperature to be normal.

This was consistent with Kozier et al. (2010), Slow Deep Breathing Exercise can reduce oxygen consumption, metabolism, respiratory frequency, heart frequency, muscle tension and systolic and diastolic blood pressure.

From table 4, it can be analyzed on days 1 and 2 based on subjective data, the pre and post intervention headache scale shows a significant difference but the objective data of blood pressure pre and post intervention on the first and second day do not show there is a significant difference which means that there are no maximum results in administering Slow Deep Breathing Exercise on days 1 and 2 to reduce the scale of headache and systolic and diastolic blood pressure. But on days 3 and 4 showed the maximum results in the administration of Slow Deep Breathing Exercise in reducing the scale of headache in hypertensive patients on third and fourth days.

The Researchers argue that slow deep breathing exercise works optimal with oxygen filled the lungs. The heart also works optimal to out the blood to the body, make blood pressure to be normal and there is no headache. This was consistent with Kozier et al. (2011), relaxation techniques Breathing deeply is a technique used to reduce levels of chronic stress and pain. Deep relaxation techniques allow the patient to control his body's response to tension and anxiety. Relaxation techniques Breathing deeply can reduce oxygen consumption, metabolism, respiratory frequency, heart frequency, muscle tension and blood pressure.

Implication this study are for nurses always teach slow deep breathing exercise for hypertension patients to make relax and reduce the headches scale, blood pressure, heart frequency, respiratory frequency and temperature. The other implication are for hypertension patients who must performed slow deep breathing exercise as a regular exercise in their home so that they didn't felt headache again, blood pressures, heart frequency, respiratory frequency and temperature to be normal.

This study has several limitations and therefore needs to be refined so that future researchers can further develop the characteristics and number of respondents to be reproduced so that the results obtained are more precise.

Conclusion

Efforts to Giving Slow Deep Breathing Exercise for 4 days four times a day have an effect on the decrease in the scale of headache and vital signs consisting of systolic and diastolic blood pressure, pulse, pulse frequency, respiratory rate and temperature of the respondent. Suggestions for further researchers to add factors counfounding BMI, smoking and exercise.

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Risk Factors of Maternal Nutrition Status During Pregnancy to Stunting in Toddlers Aged 12–59 Months

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Abstract

Maternal nutrition status during pregnancy highly contributed to risk factors of stunting among children. Bone ossification approximately begins in the sixth weeks of embryonic development and continues to the end of pregnancy. However, inadequate nutrient supply in pregnant women harmed fetal growth. The study aimed to identify the association between pregnant women's nutrition status and stunting. The case-control study using the retrospective design involved mothers with children aged 12–59 months. A proportional random sampling technique was applied to select participants. The sample was 80 toddlers, divided into 40 stunted, and 40 non-stunted toddlers. Data were taken from 27 April to 3 May 2019 through observations following the Mother and Child Health handbook and children's height. Weight gain calculation during pregnancy determined the maternal nutrition status, referred to as maternal pre-pregnancy body mass index. The univariate analysis used frequency distribution, while bivariate analysis used the chi-square test. This study obtained approval from The Health Research Ethics Committee of the Institute of Health Science of General Achmad Yani, Cimahi. The mothers' poor nutritional status caused as many as 85% of stunted toddlers' prevalence during pregnancy. Results showed that maternal nutritional status during pregnancy was significantly associated with stunting among children (p-value: 0.000). The OR value was 13,222, which means children born to mothers with inadequate nutrient supply during pregnancy were more likely to be stunted as much as 13,222 times, than children born to mothers who had good nutrient supply. It is recommended that health workers prevent stunting from pregnancy by providing supplementary food to pregnant women, and promoting the health of the maternal nutritional status during pregnancy. Suggestions for pregnant women is to increase nutrient intake and nutritional status during pregnancy to prevent stunting in children.

Keywords: Case-control, Indonesia, nutrition status, pregnancy, stunting.

Introduction

Stunting is a dominant nutritional problem in Indonesia compared to other nutritional issues such as malnutrition, underweight, and overweight, which tends to increase every year. The prevalence of stunting has continued to increase since 2016 to reach 30.8% in 2018. This achievement is further from the stunting target tolerated at 20%. West Java Province is one of the provinces with the highest prevalence of stunting in the last three years. In 2017, West Java had a stunting prevalence at the age of 0-59 months of 15.1% and experienced an increase in 2018 to 31.1% (Kemenkes RI, 2018). Cimahi City is one of the cities in West Java with a high prevalence of stunting at 0-59 months. The Cimahi City Health Office stated that the incidence of stunting in Cimahi City reached 27.78% in 2017. The highest prevalence of stunting, as many as 573 children under five, was in the Central Cigugur Health Center (Kamaludin, 2018).

Stunting has a negative impact both in the short and long term, and can even cause death in children under five years (UNICEF, 2017). Children with stunting will experience physical growth disorders, disruption of brain development, intelligence, and metabolic disorders in the body. Meanwhile, the long-term effects of stunting include low cognitive abilities and learning achievement leading to low economic productivity and decreased immunity. Hence, children get sick quickly and have the risk of developing diabetes, obesity, heart disease, stroke, and disability in old age (Picauly & Toy, 2013). This condition will be detrimental to individuals and the State.

There are two main factors causing stunting: the mother's condition and factors due to the child's condition (Rahayuwati et al, 2019; Ermiati, Setyawati, A & emaliyawati, E, 2018). Maternal factors that cause stunting include malnutrition in pregnant women, lack of maternal health during pregnancy, closely spaced pregnancy, and teenage mothers (Budijanto, 2018). While factors due to the child's condition are the intake of exclusive breastfeeding (breast milk), that is not optimal, giving too early MP-ASI, genetic factors, and nutritional deficiencies in children (Dwitama et al, 2018). Besides, a history of infectious diseases is also a risk factor of stunting in children (AM Abd El-Maksou et al., 2017).

Among all these factors, the maternal nutritional status during pregnancy is a crucial causative factor in the first thousand days of life. The pregnant woman's nutrition is the primary source of food for embryonic growth and development, which is the beginning of life (Karinne et al., 2019). Lack of nutrition during pregnancy, which is the beginning of life in the first thousand days of life, where growth occurs very rapidly, is hazardous to stunting in the first two years of life (Black, 2013). Damage during pregnancy cannot be repaired in the next phase of life and will affect health outcomes in childhood and adulthood (Soetjiningsih, 2015). Therefore the nutrition of pregnant women is an essential factor in determining the incidence of stunting.

The formation and growth of the placenta and the rapid development of fetal cells need nutritional intake from the beginning to the end of pregnancy (Alison et al., 2018). At the age of 0 days, nutrients are necessary to prepare the implantation of the conception results, namely the formation of decidua endometrium which contains lots of glycogen, protein, lipids, and minerals, which are sources of embryo nutrition since implantation before the placenta is formed (Guyton & Hall, 2012). The next stage is the growth and development of the placenta in the first week. The nutritional needs will increase to form a perfect placenta that will guarantee the transportation of oxygen and nutrients from the mother to the fetus and embryo (Alison et al., 2018). Nutritional needs will increase for embryonic and fetal development processes.

Nutrition is essential for the process of growth and bone formation since the beginning of fetal life until the end of pregnancy (Setiawan et al., 2012). At the age of six days, a skeleton is formed, which was initially in the form of cartilage consisting of mesenchyme cells, which are embryonal tissues (Sethi, Priyadarshi, & Agarwal, 2020). From the age of 6 to 7 weeks, mesenchymal cells undergo an ossification process so that the cartilage will gradually turn into hard bones. Bones will undergo intramembranous

and endochondral ossification (Alison et al., 2018). Long bones are bones that are responsible for the endochondral ossification process that allows bones to grow longer. This endochondral ossification process occurs in the plate/cartilage epiphyte area, an area at the border of the epiphysis and diaphysis bone (Sethi et al., 2020; Prendergast & Humphrey, 2014). The endochondral ossification process occurs in the epiphyseal plates that consist of four zones, namely the chondrocyte reserve zone, proliferation zone, maturation zone, and calcification zone, which are cartilages undergoing mineralization (Setiawan et al., 2012; Christiani, Setiawati, & Yulihastuti, 2017). Besides, each zone has a role.

The rest zone is rich in hyaline cartilage, which consists of ovoid-shaped chondrocytes resting and do not undergo morphological changes. A proliferation zone is a place where chondrocytes are actively mitotic. This process serves as a place for the formation of new chondrocyte cells to replace cells that have undergone hypertrophy and degeneration in parts bordering the diaphysis. This process requires the essential ingredients of protein and energy (Helmita, 2015). New chondrocyte cells formed from mitosis are flat and arranged into columns parallel to the bone's long axis, which results in increased bone length (Setiawan et al., 2012).

The maturation zone is where the chondrocytes are being calcified. This process will produce hydroxyapatite and requires calcium, phosphate, and zinc, helping the absorption of calcium. All necessary minerals must be available in fetal body fluids (Setiawan et al., 2012). In the fourth zone called the calcification zone, the calcification process occurs for the hydroxyapatite deposition to form a thin barrier around degenerated chondrocytes. In this calcification zone, there is one or several layers of chondrocytes which are hypertrophic and dead, so this zone is called the atrophy zone. The calcification process in the calcification zone is very much in need of minerals, calcium, magnesium, and phosphorus, which must be available in the fetal fluid. (Christiani et al., 2017).

The ossification process is closely related to the calcium and phosphorus content of the parent body. Calcium for fetal growth is obtained from the parent through absorption of Ca2 + from the digestive tract, reabsorption in the proximal tubule of the proximal renal kidney, and reabsorption through osteoclasts (Alison et al., 2018). Inadequate maternal nutritional intake will reduce the supply of nutrients to the fetus so that the fetal nutritional needs are not met (Karinne et al., 2019), resulting in a long growth process on the epiphyseal plate in four inhibited zones (Setiawan et al., 2012). The rate of mitosis in the inhibited proliferation zone will disrupt the process of chondrocyte replacement. If the chondrocyte proliferation rate is not balanced with the chondrocyte resorption rate, then the thickness of the maturation zone will be disrupted. The calcification zone will also decrease as it is related to the previous areas experiencing growth retardation (Setiawan et al., 2012). So that inadequate nutrient intake in pregnant women will reduce the baby's length and high potential.

This study is different from previous studies. The difference is on the measurement indicators of the nutritional status of pregnant women. This study used the calculation of weight gain during pregnancy compared to the Body Mass Index (BMI) before pregnancy. Measurements using BMI are more reliable in reflecting the nutritional status of pregnant women. In previous studies, nutritional status indicators used the Mid Upper Arm Circumference (MUAC) (Sukmawati et al., 2018). This study aimed to identify the relationship of maternal nutritional status during pregnancy with stunting in toddlers aged 12 to 59 months at the Public Health Center (Puskesmas) of Cigugur Tengah.

Method

The method used an analytic study of a case-control with a retrospective design. The population was mothers who had toddlers aged 12 to 59 months who lived in the Cigugur Tengah Health Center's working area. The criteria were, the mother had maternal-and-child health (MCH) card, the mother did not have anemia during pregnancy, and the age of the mother during pregnancy was above 20 years. The criteria determination was to homogenize the population. The MCH card was a population requirement to get

historical data about the mother's weight and height before pregnancy and weight gain during pregnancy. Data regarding maternal weight before pregnancy, weight at the end of pregnancy and height at pregnancy are secondary data obtained from the MCH card. These data were needed to determine the history of a mother's nutritional status during pregnancy and to obtain a history of anemia during pregnancy. Based on these requirements, a population of 180 mothers was selected, who were generally newcomers, since Cigugur Tengah includes urban areas. The sample size was obtained using an unpaired categorical formula. According to Dahlan (2010), the basis is the categorical data scale and the unpaired data. The sample obtained was divided into two groups, consisting of 40 non-stunted toddlers and 40 stunted toddlers. The sample was obtained through a proportional random sampling technique because the population spread over several neighborhood groups (Rukun Warga-RW). Sampling was carried out in three RWs with a high incidence of stunting. From each RW, the number of samples was obtained based on proportional calculation, from RW 13, 12 stunted, and 12 not-stunted toddlers, from RW 14, 14 stunted, and 14 not-stunted, and RW 19, 14 stunted, and 14 not- stunted toddlers. The sample determination was conducted randomly in each RW.

The nutritional status was collected from the MCH handbook to get data on maternal weight before pregnancy and weight gain during pregnancy, Furthermore, the nutritional status of pregnant women was obtained by comparing weight gain during pregnancy with Body Mass Index (BMI) before pregnancy. Data on the stunting of toddlers are collected by measuring toddlers' height using a microtome, and then the toddler's height is compared with the Z-score (TB/U) table (Kementerian Kesehatan RI, 2018). Data on height and age of children are primary data. Data collection was conducted from 27 April to 3 May 2019. Furthermore, the univariate data were processed with frequency distribution, while the bivariate data used the Chi-square test. The study results were presend in tables. This study received ethical approval from the STIKES Research Ethics Committee general Achmad Yani number 49/KEPK /V/2019.

Results

Table 1 Frequency Distribution of Maternal Nutritional Status During Pregnancy in the Stunting and Non-Stunting Groups In Cimahi City West Java Province in 2019

Stunted	Stunting		No Stunting	
	n	%	n	%
Mother with less weight gain	34	85.0	12	30.0
Mother with normal weight gain and mother with excessive weight gain	6	15.0	28	70.0
Total	40	100	40	100

Table 2 Relationship of Maternal Nutritional Status during Pregnancy with Stunting in Toddlers Age 12-59 Months at Cimahi City West Java Province in 2019

Variable	Stunting		No Stunting		P Value	OR (CI 95%)
	n	%	n	%		
Mother with less weight gain	34	85.0	12	30.0	0.000	13.222 (95% CI: 4.400 – 39.732)
Mother with normal weight gain and Mother with excessive weight gain	6	15.0	28	70.0		
Total	40	100	40	100		

The percentage of maternal nutritional status during pregnancy in the stunted and non-stunted groups in Cimahi City, West Java Province in 2019 can be seen in the following Table 1.

Table 1 shows that in the group of stunted toddlers, most of the mother's conditions during pregnancy were in poor nutritional status.

The relationship of maternal nutritional status during pregnancy with stunting in toddlers can be seen in Table 2 below.

Table 2 illustrates the results of the chi-square statistical test with the Continuity Correction test. The p-value was smaller than α (α = 0.05), so it could indicate a relationship between the mother's nutritional status during pregnancy and the stunting in toddlers. The statistical test results obtained an Odds Ratio of 13.222 (95% CI: 4.400 – 39.732). This means that mothers who gained less weight had a risk for stunting in toddlers by 13 times compared to toddlers whose mothers experienced normal weight gain and mothers with excessive weight gain.

Discussion

The results found that the majority of stunting toddlers were toddlers born to mothers who were malnourished during their pregnancy. Poor nutritional status in pregnant women is still a significant problem in Indonesia (Kementrian Kesehatan RI, 2018). The level of education, maternal knowledge, and social-economic status are the dominant causes (Irianto, 2014; Notifa et al., 2016). This factor is characteristic of urban migrants. Mothers are less able to modify the daily diet with the available income. Mothers' skills in choosing foods require knowledge and awareness of the importance of nutrition during pregnancy. Lack of knowledge and information causes pregnant women to consume food based on what is found and desired, only to overcome hunger without considering the nutritional value.

The study results stated that poor nutritional status during pregnancy risks stunting in children thirteen times compared to mothers with good nutritional status during pregnancy. The results of this study are in accordance with previous studies (Sukmawati et al., 2018; Pusparini et al., 2016). The maternal nutritional status will determine the fulfillment of micro and macronutrient dietary needs during pregnancy for the formation of the placenta, amniotic fluid, organogenesis, and fetal growth and development from the beginning to the end of pregnancy (Black, 2013). Poor nutritional status in pregnant women will result in a reduced supply of nutrients to the fetus, thereby disrupting the fetus's process of organogenesis, growth, and development (Rahmaniar et al., 2011).

The maternal nutritional status determines the process of the formation of an entire placenta. The placenta structure begins with the creation of decidua endometrium starting at the age of 0 days, requiring the essential ingredients of glycogen, proteins, lipids, and minerals (Guyton & Hall, 2012). These essential ingredients are obtained from the mother; when the mother does not have these nutrient reserves, the formation of decidua endometrium and placenta will be incomplete. An imperfect placenta decreases the supply of oxygen, nutrients, and minerals to the fetus during pregnancy. Fetal life is very dependent on the entire placenta. The supply of blood, oxygen, nutrients, and primary minerals is highly dependent on the placenta because the intestinal and renal fetuses are not functioning (Fikawati et al., 2015; Sethi et al., 2020). Therefore, it takes an entire placenta to ensure the fulfillment of all fetal needs. The entire placenta is formed from the maternal nutritional reserves.

The maternal nutrition status will determine the nutrient reserves needed for fetal organogenesis, including bone organ formation. Human fetal cartilage framework and primary ossification center in the vertebra and long bones are completed in the first trimester (Sethi et al., 2020). The cartilage formation process requires essential protein compounds (amino acid composition), namely collagen, as the dominant structural material in the bone matrix (Guyton & Hall, 2012). The essential ingredients of collagen bones are obtained from the mother. If the mother cannot fulfill this need, then the formation of fetal cartilage skeleton and primary ossification center in the vertebra and long bones will be inhibited, including

the potential for reduced bone length. The primary ossification center of the long bones and vertebrae, which is the center of the fetal body's length, has been completed in the first trimester, it can no longer be formed at a later time.

The maternal nutritional status will still guarantee the continuity of the subsequent bone formation process. That is the endochondral ossification process, which allows the bones to grow long, and the intramembranous ossification process helps to harden the bones. The endochondral ossification process of the long bones occurs in the epiphyseal plate, which is the center of fetal length increase. The epiphyseal plate is divided into four zones: the reserve zone, proliferation zone, maturation zone, and mineralization zone. The proliferation zone is a zone where active chondrocyte cells produced new cells by mitosis. This process requires the main ingredients of protein and minerals obtained from the mother. In this condition, also mitochondria of chondrocyte cells need an adequate source of energy for the process of mitosis (Helmita et al., 2015). The mother is the primary source of protein and energy in fetal life through the placenta (Sethi et al., 2020). Lack of energy sources and maternal protein reserves will cause a decrease in the supply of protein and energy to the fetus, thereby inhibiting the mitosis of chondrocyte cells (Helmita et al., 2015). So inhibition of bone cells' formation will cause the thickness of the proliferation zone to decrease. The proliferation zone will affect the next zones, namely the maturation and mineralization zones. It will cause cells shorter in the maturation and mineralization zones, for in those zones, cell proliferations do not occur again (Setiawan et al., 2012; Christiani et al., 2017).

Calcium is an essential nutrient needed in the ossification process in the maturation zone. New cells in the proliferation zone will shift towards the maturation zone. Chondrocyte cells will experience hypertrophy and vacuole; in this zone, there will be no new cell formation (Setiawan et al., 2012). In the maturation zone, chondrocytes play a vital role in the calcification process. Chondrocytes accumulate Ca ++ ions in their mitochondria, which then form matrix vesicles. The matrix vesicles will mutually aggregate to form globules that subsequently form hydroxyapatite crystals in the longitudinal septa of the maturation zone. This hydroxyapatite crystal is a material for the process of mineralization and bone calcification in the mineralization zone.

The mother is the primary source of calcium in fetal life through the placenta, which actively moves against electrochemical concentration and gradients. Ca levels of the fetus are maintained from 0.3 to 0.5 mM / L, higher than Ca levels in maternal serum, to keep the level difference between mother and fetus. Low Ca levels in maternal serum can cause low serum Ca levels in the fetus (Sethi et al., 2020). Low Ca fetal serum causes inhibition of matrix vesicle formation; consequently, it will also inhibit the formation of hydroxyapatite crystals in the longitudinal septa of the maturation zone, which will result in the reduced thickness of the maturation zone.

A lack of zinc intake can also hamper the process of forming hydroxyapatite crystals in the maturation zone. Zinc is instrumental in the absorption of calcium by cells; if zinc levels are low, the uptake of calcium by cells will also be reduced (Setiawan et al., 2012). Zinc also plays a role in the function of growth hormone; if the zinc level is insufficient; then, the growth hormone's role is less than optimal (Black, 2013). Besides affecting bone growth, calcium ions can also affect genetic programs that determine body height. If calcium intake reduces, it will cause low blood calcium levels and may disrupt the genetic height process (Prendergast & Humphrey, 2014).

Calcium (Ca), phosphorus (Pi), and Magnesium (Mg) are the major minerals in fetal bone mineralization in the mineralized zone. Hydroxyapatite crystals formed in the maturation zone will experience mineralization in the mineralized zone. The fetal Ca levels are maintained at 0.3 to 0.5 mM/L higher than maternal serum levels of Ca. This is to keep differences in levels between mother and fetus. Calcium low levels in maternal serum can cause low levels of serum Ca in the fetus. Phosphorus is maintained at 0.5 mM/l higher than maternal serum phosphorus levels. Phosphorus is

active in the endochondral ossification, which plays a role in the chondrocyte apoptosis process and osteoid formulation. Magnesium is maintained at 0.05 mM / L higher than maternal serum levels. Mg plays a crucial role in biomacromolecules (DNA, RNA, and Protein), forming an energy-producing bone matrix. Fetal magnesium levels depend on maternal mg intake; if the mother lacks mineral intakes, then fetal serum mineral levels will decrease. Low levels of minerals in fetal serum will inhibit the mineralization process in the mineralized zone, osteoblast dysfunction, and disrupted bone metabolism (Sari et al., 2016). This condition decreases the thickness of the mineralized zone. This in Turn causes the baby's length to be reduced and the potensial for reduced height as well.

Status of mothers with poor nutritional conditions has the potential to reduce fetal height after birth. Mothers who are unable to meet the fetal protein needs will inhibit chondrocyte cell proliferation in the proliferation zone, reducing the thickness of the proliferation zone. Furthermore, mothers who are unable to meet the fetal calcium and zinc needs will cause a decrease in the formation of hydroxy acid crystals in the maturation zone, which ultimately inhibits the process of mineralization and bone calcification in the next area, the cartilage zone. Moreover, mothers who cannot fulfill the fetal serum mineral needs, including Ca, Ph, and Mg in the mineralized zone, will cause the thickness of the mineralized zone to decrease. Overall, unmet nutrients cause the thickness of the epiphyseal plate to decrease. The lack of epiphyseal plate thickness will reduce the fetal length and reduce the potential fetal length after birth. So the mother's status during pregnancy has the potential for stunting in children.

This study also found a unique case that stunting could occur in toddlers with mothers who had good nutritional status, even though it happened with a small presentation. The explanation for this unique case can be that the incidence of stunting may be affected by factors other than the nutritional status of pregnant women. Budijanto (2018) states that several factors underlie stunting in toddlers, including the pregnancy spacing that is too close, the teenage mother, the amount of parity, maternal height, and exclusive breastfeeding. In this study, factors of pregnancy spacing, maternal age, and maternal height were not selected. There was a possibility that these factors were the reasons for stunting in mothers with good nutritional status. Based on this, it can be a topic for further research to examine other factors that influence stunting besides the nutritional status of pregnant women.

Conclusion

The pregnant woman nutritional status is related to the incidence of stunting in toddlers aged 12–59 months. The maternal nutritional status during pregnancy determines the length of the baby and the potential length of the fetus. Recommendations for health workers are to carry out stunting prevention since pregnancy by providing supplementary food to pregnant women and health promotion of the maternal nutritional status during pregnancy. Suggestions for pregnant women are to increase food and nutritional status during pregnancy to prevent stunting in toddlers.

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The Effectiveness of Dhikr to Intensity of Pain during Active Phase in Mothers Getting Inducing Labour

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Abstract

Women in labor process with induction are more painful than normal labor that need to applicate an intervention to reduce pain in stage I labor. The purpose of this study is to determine the effect of dhikr towards intensity of pain of labor during the active phase of the mother with labour induction. The study was conducted since May until June 2018 with one group quasi-experimental design. Pain score is measured before and after dhikr using Visual Analog Scale (VAS) every 30 minutes during the active phase of first stage. The mothers who met criteria recruited as the samples. Fifteen muslim mothers who had first labor induction, starting cervical dilatation in 4 cm, gynecoid pelvis and completed cervical dilatation to 10 cm. Statistic analysis performed by ANOVA Repeated Measure test at $\alpha = 0.05$. The result of the statistical test shows that dhikr has moderate effect of 32.5% to decrease the average score of induction pain at the active phase of first stage (value-p=0.08) after controlled with confounding variables; age and parity. Dhikr had an effect on the decrease of VAS score after 30 minutes intervention (p-value = 0.016), but did not affect the measurement at the end of the first stage of labour (p-value = 0.651). Therefore, dhikr could be used to control pain of induced labor during active phase of first stage. Suggested has teached pregnant women since the third trimester and combined with the other intervention to reduce labour pain.

Keywords: Dhikr, induction labor, nursing, pain.

Introduction

Labor induction is a process of achieving vaginal delivery by stimulating uterine contractions before the onset of spontaneous labor (Goodwin, 2010). Increased frequency of uterine contractions that occur in mothers with labor induction can increase labor pain in the first stage, because strong contractions are a strong source of pain (Andarmoyo, 2013). Rahmawati (2014) stated that the pain of the first stage of labor in mothers with induction of labor was stronger than that of normal delivery mothers. In addition, drip or injection of induction of labor happens rapidly that the brain can't respond properly to pain in the early stage. Labor induction had been associated with potential risks, such as uterine tachysystole with or without fetal heart rate changes that resulting more contraction of uterine which consequency is mothers feeling more painful (Viteri and Sibai, 2018).

Pain the the First stage of labor varies in accordance with the phase. The first stage of labor consists of 2 phases, namely the latent phase (cervical opening 1–3 cm), the active phase (4–10 cm). Women begin to feel uncomfortable when entering the active phase, because the intensity of contractions begins to increase, longer. The active phase is the most appropriate phase for mothers to do relaxation techniques. (Cuningham, 2016; Rici, 2013). Women can reduce pain in stage I labor by reducing pain intensity and reduce pain sensation with relaxation therapy (Manning, 2013).

Labor pain that is not handled properly can have a bad impact. Labor pain can have a psychological impact on the mother, i.e. anxiety. Anxiety that is felt by someone can increase the secretion of adrenaline as a result of the body's response to psychological stress and hypoxia associated with labor pain. Increased adrenal secretion can cause vasoconstriction as a result of decreased uterine blood flow, resulting in the occurrence of fetal hypoxia and bradycardia which will eventually occur fetal death and can inhibit contractions, thus slowing labor (Saragih, 2017).

Duration of labor is one of the causes of maternal death, so indirectly pain in labor if not getting adequate intervention can cause maternal death. Therefore, labor pain is something that should be a concern for birth attendants, including nurses. According to the Dick-Read theory, women can reduce their pain by reducing pain intensity and reducing pain sensation with relaxation therapy (Manning, 2013). Previous studies exhibited the factors that most influenced labor pain were previous experiences of labor pain associated with parity, age (Meštrović et al., 2015; Shrestha et al., 2013; Tampubolon, 2015).

Relaxation therapy is a form of non-pharmacological to reduce pain. For Moeslim patients, one of selected choice of relaxation therapy during stage I labor process is dhikr. Dhikr is a relaxation technique that can activate God Spot, the center of religiosity in the brain. It can be stimulating hypothalamus to activate the work of the parasympathetic nervous system and increase endorphin secretion. Gate control theory explains improvement Endorphin secretion can inhibit delta-A and C neurons from inhibiting release of substance P thereby closing the defense mechanism (door gate). When the gate is closed, the message is conveyed to cerebral cortex in the form of modulation stimulation, not pain. Remembrance is a form of worship by remembering and reciting Asma Allah repeatedly (Yusuf, 2017).

Some researchs by Nurbaeti (2015), Fajriah (2013), and Sumaryani (2015) showed that dhikr had an effect on the average decrease in the intensity of first-stage labor pain in primipara. Some study the effect of dhikr on the pain in spontaneous labor had been conducted, but a little study the effectiveness of dhikr on pain intensity among inducing labour. However, nowaday, increasing rate of use of labor induction and labor pain stronger than spontaneous labor pain (Goodwin, 2010; Rahmawati, 2014). Important to know effectiveness dhikr on pain during active phase encourage to conduct research. The purpose of this study was to analyze the effectiveness dhikr on the intensity of labor in active phase of labor in inducing mother.

Method

Research design is one group quasi experimental design. Labour mothers who met the criteria were recruited in month of May to June 2018. Inclusion criteria were moeslim women, in the active phase with 4-7cm opening, first getting induction, normal pelvis (pelvic gynecoid) and had completed cervical dilatation till 10 cm. Exclusion criteria were maternal women who experienced induction failure or received pharmacological analgesic therapy and had fetal distress. From 29 mothers, 14 mothers drop-out cause of failed induction, getting Sectio cesarian birth and had fetal distress. A number of 15 mothers completed the intervention and measurement.

Selected participants who met criteria and agreed to participated in this study were explained about procedure of intervention. Before intervention, researcher collected demographic characteristics and measure pain scale. The procedure of intervention of dhikr had been done every 15 minutes since the first cervical dilatation of four. Initial mothers guided dhikr by researcher, and repeated every 15 minutes. Mothers also were provided guidance of dhikr.

The instruments consisted of demographic characteristic consist of ethnic, level of education, working status, obstetric status and labor observation sheet which is a modification of the partograph sheet. Visual Analog Scale developed by by Perry and Potter (2010) to measure the scale of labor pain in the active phase had been inserted in partograph sheet.

Pretest scores were obtained from the measurement of pain scale before the intervention with VAS at the beginning of the first phase of the active phase (opening 4-7cm) and then the researcher guided the respondent to read the dhikr when the respondent began to feel pain due to contractions until the pain of contraction disappeared during the first phase of the active phase. Posttest scores were measured every 30 minutes during the first phase of the active phase using VAS until the end of the first phase of the active phase (opening 10 cm).

Data analysis used was univariate analysis for demographic data variables, maternal age and gestational age data, obstetric data, and pain variables; Hypothesis testing uses repeated measures ANOVA, as well as to control confounding variables with the ANCOVA test.

Every research respondent gets protection by respecting the respondent's rights and holding ethical principles in research. Research respondents signed informed consent before the study was conducted as evidence that they had agreed to participate in the study. Confidentiality is guaranteed by: anonymity in the questionnaire, given a code to mark, store and process data only by the principal investigator. The ethical clearance was approved by the Tangerang District General Hospital ethics committee number 445/06- KEP - RSUTNG.

Results

Table 1 Demographic Data (N=15)

Variable	n	%
Etnic		
Betawi	1	6.7
Javanesse	2	13.3
Sundanese	12	80.0
Level of Education		
Elementary	4	26.7
Secondary	6	40.0
High School	4	26.7
University	1	6.7
Working status		

No work	15	100.0
Total	15	100.0

Tabel 2 Distribution Freqiensy of Obstetric Status (N=15)

Variable	n	%
Parity		
Primiparity	7	46.7
Multiparity	8	53.3
Previous Type of Labour		
No	7	46.7
Spontaneuos	8	53.3
Medical Diagnosis		
PROM	8	53.3
Preeclampsia	5	33.3
Postmature	2	13.3
Type of Induction		
Misoprostol	6	40.0
Misoprostol dan oksitosin	3	20.0
Oksitosin	6	40.0
Total	15	100.0

Table 3 Effectiveness of Dhikr to Intensity of Labour Pain at the Active Phase using Repeated Measures ANOVA

Score	N	Mean (SD)			Greenhouse-Geisser	Partial Eta-Squared
		Pre	Post 1	Post 2	Difference over time	
Visual Analogue Scale Score	15	8.7 (2.09)	7.47 (2.47)	7.73 (2.40)	f=6.73 P-VALUE=0.005 DF=1.92	0.325

Table 4 Result of Pairwise Comparison (Bonferroni) Test

	Mean difference	P-value
VAS before and after intervention 30 minutes	0.80	0.016
VAS before and end of stage I	0.53	0.080
VAS after 30 minutes Intervention and end of stage I	-0.267	0.651

Table 5 Covariate Analisis for Confounding

	Df	Mean Square	F	P-value
Corrected Model	2	0.167	0.166	0.849
Intercept	1	0.004	0.004	0.952
Age	1	0.291	0.289	0.601
Parity	1	0.255	0.254	0.624

Error	12	1.006
Total	15	
Corrected Total	14	

An overview of the demographic data of the respondents is presented in table 1. In general, all respondents were housewives, almost come from etnics Sundanese and with 6 participants getting their secondary education level.

The average age of respondents was at a healthy reproductive age (mean = 25.13 years, minimum 16 years and a maximum of 33 years). Most of the gestational age respondents have entered term age with an average gestational age of 38 weeks (minimum 28 weeks and a maximum of 43 weeks). Obstetric data shows that seven participants first time mothers (primipara); and all participants had gotten labour induction for the first time. Medical indications for labor induction showed that premature rupture of membran (PROM) is a case that dominates as many as eight participants (53.30%), while the type of induction given to respondents is mostly misoprostol or oxytocin each of six participants.

Intensity of pain that was felt by participants before or after the intervention of remembrance was in the range of moderate to severe pain (score 4-10). The difference between the three data sets is the average. Participants before being given the intervention of remembrance felt severe pain (8.27). The result showed that 95% of labor pain scores before remembrance are in the range of 7.11 to 9.42. The mean pain score after the dhikr intervention during the first 30 minutes decreased to severe pain (7.47) with a standard deviation of 2.47. It is believed that 95% of labor pain scores after 30 minutes of dhikr are in the range of 6.09 to 8.84. However, the mean pain score increased at the end of the first phase of active measurement (7.73).

Table 3 showed that there are at least a pair of meaningful measurements (F= 6.73; p-value = 0.005). The partial eta squared value of 0.325 indicates that dhikr has a large influence of 32.5% on changes in the labor pain score. Next Bonferroni post hoc conducted to determine the comparison of effects on the first, second, and third measurements.

Based on Bonferroni's post hoc results in table 4, the average difference in VAS scores before and after the 30 minutes intervention was 0.8 with a significance value of 0.016. This shows that remembrance has an influence on pain reduction before and after 30 minutes of intervention. Mean pain scores before and at the end of the first stage decreased by 0.53. In contrast to the average pain score after 30 minutes of intervention with the end of the first stage increased by 0.267. Nonetheless, the p-value of the two measurement comparisons > 0.05. Therefore, dhikr effect reduces pain in the early active phase but does not affect the intensity of pain at the end of the first stage

In addition, a covariate analysis test was then performed to determine counfonding factors including age and parity on labor pain intensity. Table 5 shows that maternal age and parity did not affect the decrease in VAS scores. It means that decreasing score of pain did not influenced by age and parity.

Discussion

Labor pain is an uncomfortable feeling as a manifestation of uterine contractions (Andarmoyo, 2013; Cuningham, 2016). All mothers who give birth must experience labor pain. This is in accordance with the word of God in the QS. Maryam (19): 23

"Then the pain of giving birth to a child forced him (leaning) on the base of the date palm tree, he said:" Oh dear, it would be nice for me to die before this, and I became a meaningless item, again forgotten ".

Labor pain can be caused by physiological and psychological factors (Cuningham, 2016; Leifer, 2015; Meštrović et al., 2015). Psycological factors that can affect labor pain are anxiety and fear in facing labor (Andarmoyo, 2013, Perry et al., 2013). Based on physiological factors, labor pain in the first stage is called visceral pain. Visceral pain is

pain that comes from organs. This pain results from uterine muscle hypoxia, accumulation of lactic acid, stretching of the cervix and lower uterine segments and pressure on the pelvic bones. Furthermore, afferent nerve fibers from pain are transmitted to sympathetic nerve fibers to neurotaxis between Toracal 10 to Lumbar 1 (Rici, 2013). Intensity of labour pain can be influenced by induction. Labor pain with induction differs in intensity from spontaneous labor pain. Mothers who have induction labor experience more pain than spontaneous labor (Rahmawati, 2014). Induction of labor can improve maternal and neonatal outcomes. Although induction at term could prevent rare cases of fetal death, all induced women will be exposed to potential discomfort causes of uterine hyperstimulation and more pain compared to mothers without induction (Seijmonsbergen-Schermers, 2020). In the first stage labor, generally nurses or midwives provide pain management such as breathing techniques, block pudendus, massage or effleurage to decrease pain in labor. Mardiah (2010) found that 76% nurses and midwives confered breathing techniques, movement /change of position and massage to eliminir pain in the first stage labor.

The mean maternal pain of labor with induction before dhikr is severe pain (8.27). Pain that is felt by maternity is caused by uterine contractions. The existence of anxiety, fear can also increase the pain sensation felt by the mother. This is in accordance with Fear-Tense-Pain Cycle of Dick-Read Theory (1933) in Perry et al., (2013). Mothers can control pain in labour process by reducing pain sensations with relaxation techniques (Cuningham, 2016; Leifer, 2014; Perry et al., 2013). One of the relaxation techniques of meditation for Muslims is remembrance. According to Hudori (2011) religious activities such as remembrance can increase the activity of God Spot, which is the part of the brain that controls religious activities. The existence of activation in God Spot causes impulses to be transmitted to the prefrontal cortex. The prefrontal cortex then passes it to the amygdala. The activated amygdala can stimulate the hypothalamus to activate the parasympathetic nervous system. The parasympathetic nervous system acts as a counter to the sympathetic nervous system whose activity increases due to labor pain (Sherwood, 2012). Parasympathetic nervous system activities can influence the gate control theory on the mechanism of pain in the presence of endorphins secretion by the pituitary gland. Increased endorphin secretion can inhibit Delta-A and C neurons to release substance P. Decreased substance P can close the defense mechanism (the gate), so that the message delivered to the cerebral cortex is not pain but modulation of pain. In general, the activity of the parasympathetic system in addition to pain modulation can also increase a sense of calm, comfort, relax muscles, and make the body more relaxed (Yusuf, 2017).

The benefits of remembrance that can activate the work of the parasympathetic nervous system have also been explained in Qoran:

الَّذِينَ آمَنُوا وَتَطْمَئِنُّ قُلُوبُهُمْ بِذِكْرِ اللَّهِ ۗ أَلَا بِذِكْرِ اللَّهِ تَطْمَئِنُّ الْقُلُوبُ

"(Ie) those who believe and their hearts are at peace in the remembrance of Allah. Remember, only by remembrance of Allah do hearts find satisfaction. "(Surat Ar Ra'du (13): 28).

A Prophet Mohammed said:
"A group of people who dhikr to Allah SWT, must be surrounded by angels, filled with grace, descended calm, mentioned by Allah among the creatures who are on His side" (HR. Muslim).

The above theories and propositions are consistent with the results of this study. The mean pain score after zikr has decreased, both after 30 minutes of zikr and at the end of the first phase of the active phase. The mean pain score before remembrance was 8.27 with a standard deviation of 2.09. After 30 minutes of remembrance, the mean pain decreased to 7.47. The mean pain score at the end of the first stage when compared to before the dhikr also decreased by 0.53, so the mean pain score was 7.73.

The results of this study indicate that there is a pair of meaningful measurements and remembrance had a major influence on changes in labor pain scores in the active phase of the first phase by 32.5%. Labor pain can be influenced by several factors. According

to previous researchs, factors affected labor pain were the age of the mother and parity (Mestrovic et al., 2015; Shrestha et al., 2013; Tampubulon, 2015). The participants in this study were in the age range 16-33 years with a mean of 25.13. Based on statistical results using Test ANCOVA, age does not affect the decrease in labor pain score (p-value = 0.601). This means that mothers in all age ranges are the same feel pain at labor by induction. This is different from spontaneous delivery, labor pain felt by the mother is greatly affected by age (Maghfiroh, 2012; Shrestha et al., 2013; Tampubulon, 2015). Based on the readiness of the mother to give birth, the age is categorized into low-risk (20-35 years) and high-risk age (<20 years or> 35 years). Shrestha et al. (2013) explained that mothers under the age of 20 experience severe pain more than the older mother. This may happen because of a young mother psychologically have not enough emotion and psychology adults who can affect their acceptance of labor pain (Cunningham, 2016). Another factor that most influences to labor pain is parity. This result similar with Maghfiroh (2012) that parity status and previous experience of labor pain can be affected the pain of first stage labor in spontaneous labor. Parity status is related to the experience of dealing with pain previous delivery. Multipara is considered to have had deep experience faced previous labor pains, resulting in on delivery then she is better able to control the pain of her labor than primipara. Furthermore, based on the post hoc analysis Bonferroni showed that the dhikr affected the reduction in pain in the measurement after 30 minutes of intervention (p-value = 0.016) at the opening of 4-7cm. The results of this study are in line with the results of research by Fajriah (2013) and Nurbaeti (2015) that prove the influence of dhikr on the reduction of labor pain in the active phase. However, there are differences with the results of previous studies conducted by Nurbaeti (2015). In previous studies, dhikr had a large influence of 66.5% on the reduction in labor pain, while in this study the influence of dhikr was 32.5%. The large difference in influence can be due to differences in research subjects. Subjects from previous studies were mothers with normal deliveries, while the subjects in this study were induction mothers who had greater pain intensity.

The measurement of pain is then performed at the end of the active phase I ie at 10 cm opening with a mean pain score of 7.73, and it is believed that 95% of the pain score at the end of the active phase of the active phase of induction labor is 6.4 to 9.06. Bonferroni's post hoc analysis showed the remembrance did not have an effect on changes in pain scores at the end of the first phase of active measurement (p = 0.08). Non significant in the end of stage I causes mothers in transition to complete cervical ripening feel lost control, unable to relax, are easily offended because the contractions are felt to be very strong, more display and more painful, and the mother has focused on the second stage of labor. Thus, Nurse midwives should manage to control pain from the beginning to end of first stage labour (Karlsdottir et al., 2014).

Conclusion

Dhikr significantly effected to lower intensity of pain at early stage I among inducing mothers but have no effect in end of stage I labour after controlled by age and parity. Dhikr can use to control pain in early first stage I labour both for primiparaous or multiparaous. This study had limitation of recruited in small group with one group for future research we suggest to conduct quasy experiment with two group control and intervention.

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