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Nursing Modality Therapy (Spiritual Deep Breathing) Resolve Student Distress

Kushariyadi, Grysha Viofananda Kharsima Ade Agung, Faizatul Mazuin, Fitriany
Faculty of Nursing Universitas Jember, Jember Indonesia
Corresponding email: kushariyadi@unej.ac.id

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Abstract

The condition of nursing faculty students has many academic tasks such as attending classes, taking exams, socializing, adjusting to fellow students with different characteristics and backgrounds, developing talents and interests through non-academic activities. This condition causes students to not be able to manage time well so that they experience distress. Quasy experiment research used two groups pre-post-test design. The sample included 15 control groups and 15 treatment groups. The sampling technique uses simple random sampling. Research variables include spiritual deep breathing therapy and distress rate. The instrument uses depression anxiety stress scale-42 (DASS-42) in the form of a Likert scale. This type of unfavorable questionnaire contains 42 questions. The spiritual instrument deep breathing therapy is about 20 minutes a day for seven days. Statistical test using Wilcoxon signed rank test against both groups. There was a significant effect on the treatment group (p-value 0.001). In the control group there was no effect (p-value 0.263). Distress conditions in a person can be overcome with one therapy such as spiritual deep breathing therapy. Spiritual deep breathing therapy as a therapy for nursing modalities can optimize oxygen demand for cells that are distressed, blood flow to the muscles decreases otherwise blood flows to the brain and skin increases so as to provide a sense of warmth, comfort and calm.

Keywords: Distress, nursing modality therapy, spiritual deep breathing therapy.

Introduction

The condition of students Faculty of Nursing, University of Jember have the academic demands such as attending class, obeying the exam, socialize, adapt to the characteristics and fellow students of different backgrounds, develop their talents and interests through non-academic activities. Students cannot manage time well so experiencing distress.

The prevalence of distress in students in North America by 100 respondents (38%) (Shannone, 1999). The prevalence of distress in students in the UK as many as 165 respondents (31.2%) (Firth, 2004). The prevalence of distress in students in India as much as 180 respondents (34%) (Kumar, 2011). The prevalence of distress in students in Saudi Arabia of 494 respondents (57%) and in Malaysia as many as 396 respondents (41.9%) (Sherina, 2004). The prevalence of distress in students in Indonesia in University of Jember Health Services Unit as many as 79 respondents (75.9%) (Wahyuni, 2015). The prevalence of distress at Faculty of Medicine University of Jember students categorized as moderate stress were 107 respondents (57%) (Evanda et al., 2014).

The cause of distress among other demands of academic life, social, and personal (Dyrbye et al., 2006 in Jaisoorya et al., 2017). Lots of activities and tasks, environmental changes, loss of social support, academic pressure, relationships with peers, and financial problems into soulmate factor causes distress (Azzahra, 2017). The bad interpersonal relationship is the most common stress factors (Hashimoto, 2012). Factors that cause stress, according to research Saam (2006) of the Faculty of Medicine students of Riau are personal factors, family, school, and community. Personal factors include the inability to set the time, the monthly money runs out, exhausting themselves to study, friends are too often comes to renting, pain does not go away, trouble with friends, mood changes frequently, breakup, lack of affection from a lover, and breakup. Family factors include parents divorced, unfettered, parents quarreling, lack of affection and parents do not meet the wishes of children. Factors include the campus and piling too many tasks, to study for a full day, yet have lecture materials, problems with teachers, professors do not understand the explanation, a full exam for one week. Community factors include isolation, protests or criticism, receive discrimination and bullying, the environment is not conducive.

Impact distress resulting in decreased concentration and school performance because burdened by campus and social life. Interpersonal stressful experiences lead to serious problems. Mental health problems like depression and anxiety cause stress interpersonal (Hashimoto, 2012). Severe distress cause auditory hallucinations that disrupt the central nervous system, stimulates the negative voices even endanger yourself and others (Ellet, 2017). Distress detrimental impact on physical and mental health cause spiritual distress individuals and families (Dewi, 2014). Decreasing the concentration of student learning therefore burdened campus and social life, as well as poor social interpersonal relationships. Another impact of distress such as hypovolemic shock, impaired tissue perfusion, energy use disorders, delayed wound healing, and the rate of metabolism disorders (Winkler et al., 2008).

One solution is to give students overcome distress spiritual deep breathing therapy. Therapy appropriately and regularly can give maximum results. Application of nursing modality therapy is useful for improving the quality of life and improve health (Sepdianto, 2008).

Method

The study was quasi-experiment using two group pre-posttest design. The study aims to determine the distress of students before and after giving nursing modality therapy spiritual deep breathing. Measuring the level of distress (pretest) in the treatment and control group respondents then provide intervention spiritual deep breathing therapy and re-measure the level of distress (posttest) in the treatment and control group respondents.

Total sample each treatment group and control as many as 15 respondents. The research using simple random sampling techniques. Inclusion criteria include: 1)

gender to male and female; 2) aged 18-21 years; 3) co-operative; 4) willing to become respondents; 5) actively enter the class; 6) can be measured stress level.

Place of research at the Faculty of Nursing, University of Jember August 2017.

The study used an instrument nursing modality therapy spiritual deep breathing. Adopting and modifying of research Benson (1974), entitled "your innate assets for combating stress" with spiritual therapy. This technique can relieve pain, insomnia, anxiety, and stress. Implementation of the therapy duration of 20 minutes per day for seven days.

Instruments distress using a questionnaire depression anxiety stress scale-42 (DASS-42) and has received permission from the author. The DASS-42 questionnaire is adapted from Matthews (2016), entitled "distress". Scale questionnaire Likert scale. Question unfavorable types. amounted to 42 of the questions. Rate each question: 1) value of 0 (no or never); 2) the value of (according to experienced up to a certain level, or sometimes); 3) value of 2 (common); 4) value of 3 (very appropriate with experienced, or almost all the time). The final assessment: 1) the value 0-14 (normal); 2) value of 15-18 (mild stress); 3) value of 19-25 (moderate stress); 4) value of 26-33 (stress); and 5) the value of ≥34 (very severe stress).

Data collection and processing stages include: 1) conduct research and fill permit informed consent as a sign of willingness; 2) measuring the level of distress (pre-test) on the first day; 3) provide nursing intervention modality therapy spiritual deep breathing for 20 minutes on the first day until the seventh; 4) measuring the level of distress (posttest) after administration of nursing modalities therapy spiritual deep breathing on the seventh day; 5) analyze the research data using the Wilcoxon signed rank test with $p < 0.05$ towards treatment groups and control groups (Nursalam, 2008).

This study applies the ethics of research include: 1) research consent form; 2) anonymous; 3) safety and comfort; 4) confidentiality; 7) justice (Potter & Perry, 2006).

Results

Table 1 Characteristics of Respondents Based on Gender, Age and Heart Rate

No	Respondent Characteristics	Treatment		Controls	
		f	%	f	%
1	Gender				
	Female	8	53.33	7	46.67
	Male	7	46.67	8	53.33
2	Age				
	Young	10	66.66	12	80
	Adults	5	33.33	3	20
3	Vital signs				
	1. Blood Pressure				
	Normal	15	100	15	100
	Hypotension	0	0	0	0
	Hypertension	0	0	0	0
	2. Heart Rate				
	Normal	15	100	15	100
	Tachycardia	0	0	0	0
	Bradycardia	0	0	0	0
	3. Respiratory Rate				
	Normal	13	86.67	14	93.33

Tachypnea	2	13.33	1	6.67
Bradypnea	0	0	0	0
4. Temperature				
Normal	10	66.67	14	93.33
Hyperthermia	3	20	0	0
Hypothermia	2	13.33	1	6.67

Test Results Wilcoxon Signed Rank Test

Table 2 Results of Wilcoxon Signed Rank Test in Treatment Group

Category	n	Median (min-max)	mean ± SD	p
Distress before the intervention	15	15 (7-27)	4.998 ±15.53	0.001
Distress after intervention	15	6 (4-14)	6.53 ± 2.850	

Table 3 Results of Wilcoxon Signed Rank Test in Control Group

Category	n	Median (min-max)	mean ± SD	p
Distress as a pre-test	15	13 (3-26)	6.307 ±13.07	0.263
Distress when the post-test	15	15 (5-23)	13.87 ± 5.330	

Table 4 Results of Mann Withney U Test

Category	n	Median (min-max)	p
Control Group	15	8 (3-26)	0.001
Treatment Group	15	15 (8-23)	

Characteristics of Respondents

Table 2 shows the mean of 15.53 distress before the intervention and after intervention by 6.53. The mean distress declined by 9.00. Results of the Wilcoxon test showed p=0.001 (p<0.05) means that there is a significant difference between prior to giving spiritual deep breathing therapy and after being given spiritual deep breathing therapy.

Table 3 shows the mean of distress as a pre-test of 13.07 and the current post-test of 13.87. The mean distress increased by 0.8. Results of the Wilcoxon test showed p=0.263 (p>0.05) means that there is no significant difference between the current pre-test to post-test time.

Table 4 shows results of Mann whitney statistical test between post treatment group and post control group showed ρ = 0.001 because the value of ρ <0.05, it was concluded that there was a difference in the administration of spiritual deep breathing therapy between treatment and control groups.

Discussion

Distress in Treatment Group

Table 2 shows a significant difference (p=0.001) were significant distress among college students before and after giving of spiritual deep breathing therapy. Looked at the results of the average value of student distress before giving treatment 15.53. After giving treatment mean value of student distress becomes 6.53. There is a decrease in mean values distress difference between pre-test and post-test of 9.00. This means giving spiritual deep breathing therapy effect on student distress.

Research in the Southern Illinois University School of Medicine, the USA in 2004-2006 proved that distress affects the performance of students from both academic and non-academic. Giving techniques stress reduction regularly and consistently to students in some medical schools can help overcome academic problems due to stress. The results of the study reported that the perception of anxiety, nervousness, doubt, and loss of concentration was decreased (Paul, 2007).

Research in Japan proves the use of techniques deep breath as a method to reduce tension and improve mood. Another method uses relaxation techniques of yoga and progressive muscle relaxation (Hayama, 2012).

Nurhadi & Nursalam study (2003) that the spiritual guidance of a positive impact on stress reduction clients who are hospitalized and clients with a terminal illness. Stress reduction impact on increasing the immune response so that clients can minimize secondary infections.

Research Valentina (2016) that there are significant deep breathing relaxation techniques with improved mood thereby reducing the level of stress in terms of evaluation self-reported as well as heart rate and salivary cortisol levels.

Harris Research & Coy (2003) that students can use breathing relaxation techniques to calm down during the exam. Students who meditate use breathing relaxation techniques showed significant improvement in academic achievement. Research Adams (2004) that the relaxation techniques helpful respiratory symptoms ward or response light flight associated with anxiety and distress include increased heart rate, respiration, blood pressure, muscle tension, and discomfort.

Use of the effect of relaxation therapy trivial but with the advantages of the technique that is fast, simple and involves minimal resources into appropriate solutions in all circles. Research shows this therapy is easy to learn (<10 minutes) and effectively used by all ages, especially children 5 years old. This therapy is easier to apply than the anti-stress therapy techniques others although the main obstacle is the inability flew children's describing health problems (Valentina, P., & Blandini, M. (2016).

Respiratory effects in the student sample show taking deep breaths can help reduce feelings of anxiety and stress, improve performance and concentration. Deep breathing can also reduce some symptoms of Parkinson's disease, epilepsy, posttraumatic stress disorder (PTSD), depression, hypertension and other chronic diseases. Breathing in is also useful as a simple motor skills disabilities rehabilitation (Valentina, 2016).

Based on the data characteristics of the respondents (pulse) that takes 10-20 minutes a day to achieve relaxation against stress. It is important in the relaxation program are 1) the repetition of a word, sound, prayer, thought, phrase or muscle movements; 2) re-focus and concentrate to repeat when the mind is disturbed. Evidently, if the pulse becomes stable because exfluks Ca2 + which make increased vascular permeability that gives the effect of comfortable, relaxed, and calm.

Data characteristics of the respondents (respiratory rate) that appear regular or irregular rhythm in the treatment group. This suggests that there is feedback response in the hypothalamus secrete ACTH which will lower cortisol production, thereby reducing the striated muscle contraction lungs that provide the quiet and comfortable effect.

Conclusion

There is a decrease in distress before and after nursing modalities therapy spiritual deep breathing in the treatment group. No decrease in distress as a pre-test and post-test in the control group.

Nursing modalities therapy spiritual deep breathing is a technique that combines a breath in the spiritual aspect of the method that begins the prayer so as to calm the mind and have a positive impact and a sense of comfort to the body cope with stress. The benefits of deep breathing spiritual therapy is indeed not directly felt in all therapy but it should be continued so that it will provide a fresh effect, comfortable, relaxed in students so that they can improve learning achievement. Need the active participation of students to use these therapies independently so that decrease stress levels are visible.

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Tera Gymnastic Effective for Patient with Hypertension

Hesti Platini, Sandra Pebrianti, Indra Maulana
Faculty of Nursing, Universitas Padjadjaran, Bandung, Indonesia
Corresponding email: hesti13001@unpad.ac.id

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Abstract

Hypertension is a cardiovascular disease globally. Hypertension is remains silent killer, the clinical strategy to focusing on new and improved treatments is exercise. Tera gymnastics is a physical and mental exercise, combining the movement of body parts with breathing techniques and rhythms through the concentration of thought that is carried out regularly, harmoniously, correctly and continuously, Physical activity can reduce high blood pressure. Some study showed Regular physical activity is an effective intervention with respect to these factor, decreasing mortality rate for cardiovascular disease and all cause of disease in hypertensive patient. Gymnastic Tera exercise can help to control metabolic variable related to hypertension. The study was use quasy experimental design with one group pretest-posttest. The study was conducted in Puskesmas Pasundan Garut. Sampling in this study is subjects that is criteria patients has hipertension with 8 weeks treatment so will take methode of concecutive sampling with 15 respondents for intervention group and 15 for control group. The sample were age 30-55 years. The Intervention was gymnastic tera exercise. The Blood pressure function was evaluated before and after the training period. The data were analyzed by using t-test paired. The result showed a significant difference before and after tera gymnastic exercise in patient with hypertension I (p=000.0). Result of systolic blood presure when in mean SD pretest is 146.00 higher than post test is 136.00 in intervention group. The tera gymnastic exercise conditioning program achieved effect in this population. The reduction of blood pressure after exercise is of great clinical relevance. The increased risk of physical inactivity in controlling hypertension in our study suggest that general practitioners must be in the habit of prescribing practice of physical exercise. Physical activity has been shown to have beneficial effect on blood pressure. patients are followed up regularly to confirm that they are adhering to the management plan and the blood pressure targets.

Keywords: Exercise, gymnastic tera, hypertension.

Introduction

Hypertension is one of the most deadly chronic diseases in the world by contributing 9.4 million mortality every year (WHO, 2013) in Kharisna, Ropi, and Rahayu (2018). High blood pressure is the risk of risk cardiovascular disease (CVD) and all cause of mortality. Data from the World Health Organization (WHO) in 2015 showed that around 1.13 billion people in the world have hypertension, Meaning that 1 in 3 people in the world is diagnosed with hypertension. The number of people with hypertension continues to increase every year, it is estimated that in 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 9.4 million people die from hypertension and its complications. (Depkes.go.id). Hypertension is risk factor for more cardiovascular heart disease. High blood pressure condition increase risk of heart attack, hearth failure, and, sudden cardiac death (Arima, 2011). Patient often fail to recognize essensial high blood pressure as a disease until it is identified by a physician. If we successfully control blood pressure with a healthy lifestyle, we might avoid, delay or reduce the complication from hypertension. Reducing high blood pressure can decreased cardiovascular by achived by non-pharmacological. Lifestyle change should be the initial approach to hypertension management and include physical exercise (Gupta & Ghupta, 2010). Exercise training has an important role in the prevention and treatment of high blood pressure.

Exercise is the key of management hypertension. However, the overall low of studies and lack of data about exercise. Some people who incapable, weak, and sickly person cause them to treat the helpless human, so that all activities are very limited. This condition is exacerbated by the lack of time, place, and opportunity for their doing activities to fill the rest of his life. Therapy of hypertension focuses on pharmacology. Those therapy are affecting on physiological mechanism. For holistic approach, hypertensive people need combined the conventional therapy with modalities therapy. One of modalities therapy for reduce high blood pressure are by exercise. Exercise is recommended as one of lifestyle intervention in the treatment of hypertension by many guidelines (Peri-Okonny, Fu, Zhang, & Vongpatanasin, 2015). Moderate intensity aerobic one of the management for hypertension. Aerobic has direct effect of blood pressure. But there insufficient evidence about the safety and efficacy of isometric resistance training to recommended it. But not all hypertension patients are allowed this exercise. Aerobic has been proven and prevent hypertension for help management hypertension stage 1 (Ghadieh & Saab, 2015). Another exercise for hypertensive patient not only moderate intensity aerobic, but also tera gymnastic. Therefore, the people need to maintain the condition of his body by exercise, one of them is tera gymnastics. Tera gymnastics is light, gentle and easy for all ages.

Tera gymnastics is a physical and mental exercise, combining the movement of body parts with breathing techniques and rhythms through the concentration of thought that is carried out regularly, harmoniously, correctly and continuously (Eriyanti et.al., 2016). Continuous exercise training is the type of physical activity most frequently recommended to hypertensive subject. Regular physical activity is an effective intervention with respect to these factor, decreasing mortality rate for cardiovascular disease and all cause of disease in hypertensive patient (Guimaraes et al., 2010). In addition tera gymnastic help to control metabolic variable related to hypertension.

Training has an important role in the prevention and treatment of hypertension (Giolac et al, 2010). Exercise training is the type of physical activity most recommended to hypertensive subject. Training for hypertensive patient has many benefit, such as helping patient to their physical activities before the disease, optimizing body physical, and preventing complication. However, the rate about tera gymnastic participation both worldwide and Indonesia still low. There are not many patient actively participate. This study aims to determine the influence of tera gymnastics on blood pressure in hypertension patients and to demonstrate the effect of physical activity on controlling blood pressure So the benefit of this research is to know how big the benefits of tera gymnastics

against blood pressure hypertension patients. Tera gymnastics gives effect to the heart system and blood gain in improving its ability. More blood vessels (small blood vessels) are built in active tissue to regulate food and oxygen supply, and exercise consumes more in the system and inhibits fat reserves in blood vessels, thereby reducing the risk of thrombosis Hardjana (2000) in Eriyanti et al. (2016).

Method

The study was quasy experimental design with one group pretest-posttest. Sampling by means of concecutive sampling with 15 respondents for intervention group and 15 for control group. Inclusion criteria : Patients with stage 1 hypertension, kooperatif, willing to be respondent, there is no history of diabetes, had quit smoking less than 3 months. The sample were age 30–55 years, because after the age of 30 years there is a 1% decrease in heart pulmonary fitness every one year of age which is an indicator of oxygen consumption by the heart and lungs, the pulmonary heart fitness will decrease by 35%. The Intervention was tera gymnastic exercise. The study was conducted in Puskesmas Pasundan Garut with the most incidents of hypertension. All patient attended an exercise training programmed three time a week for a period of 8 weeks. The Blood pressure function were evaluated before and after the training period. Blood pressure monitoring was performed at base line and follow up with .The data were analyzed by using t-test paired to compared two group, group intervention and control group. Participants were instructed to practice their gymnastic tera daily throughout the 8-week intervention phase. During screening sessions blood pressure was recorded posttest and pretest for total 2 measurements per session. The blood pressure recorder was calibrated using in sphygmomanometer.

Results

That population has met the inclusion criteria of 15 person (X1 = 15, X0 = 15). Research subjects were selected with high blood preasure. Tera gymnastic exercise was associated with a significant reduction in mean systolic and diastolic blood pressure. Characteristic respondent in this research is

Table 1 Results of Homogeneity Test by Age Tera Gymnastic Group and Control Group

Variable	Gymnastic Tera Group		Control Group		P value
	n=15				
	F	%	F	%	
35–40	4	23.7	5	33.3	0.525
40–55	11	76.3	10	66.7	

Tabel 2 Average Differences of Pretest and Posttest Results Blood Pressure Hypertension Between Tera Gymnastic Group with Control Group

Group	N	Prettest Mean (SD)	Posttest Mean (SD)	P-Value
Intervention Group	1			0.001
Systolic	5	146.00 (0.114)	136.00 (0.007)	
Diastolic		91.02 (0.108)	89.20 (0.002)	
Control Group	1			
Systolic	5	145.00 (0.118)	144.20 (0.101)	
Diastolic		91.00 (0.110)	90.02 (0.108)	

patients with hypertention with 1st grade .

The two group had similar age, office blood pressure and current medication distribution. And the 30 subject completed the protocol. This is proven by the value of p value that was bigger than α (0.05).

Based on the table above, it can be explained that the average difference of blood pressure between group of tera exercise is p-value = 0.001 (α <0.05), this can be interpreted there is difference between group of control after given exercise. From the description of the research results obtained the average. The reduction in blood pressure have been shown to occur after only 4 weeks in individuals with elevated high blood pressure. The result showed a significant difference before and after tera gymnastic exercise in patient with hypertension I (p=0.000). That tera gymnastic exercise decrease systolic and diastolic blood pressure.

Discussion

This study shows that gymnastics can produce effects on decreasing blood pressure. Effects of decreased blood pressure in hypertensive patients on normotensive people. Therefore, exercise contributes to the control of blood pressure in hypertensive patients and is likely to contribute to the prevention of hypertension in normotensive subjects. Aerobic is an effective method to lower blood pressure and improve other cardiovascular risk factor (Hansen et al, 2011). Tera exercise group is more effective than control group, its significant different before and after exercise. gymnastics tera can improve fitness in the elderly (Nursalam, 2009). Low exercise activity physical as gymnastics, also can cause hypertension due decreased cardiac output pumping to the heart becomes more reduced.

The frequency relationship of tera gymnastics against systolic blood pressure shows a strong relationship. High blood pressure is systolic pressure of more than 140 mmHg and diastolic blood pressure more than 90 mmHg. Hypertension is a multifactorial disease which arises due to various interactions factor. Blood pressure will increase after aged 45 - 55 years, the walls of the arteries will be thickening by the presence accumulation of collagen substances in the muscle layer, so that blood vessels will gradually narrowed to rigid. Enhancement age will cause some changes physiologically, there is an increase peripheral resistance and sympathetic activity.

Blood pressure and heart rate both rise when exercise. It can lower blood pressure and heart rate rest. This is because training improve the health of heart and blood pressure allowing cardiovascular system to function efficiently. When exercise heart's contraction also increases while exercising, there more blood is pumped with each beat. Both groups reported excellent adherence to the task instructions.

In this study the result of tera gymnastic is significant (p=0,000) can improved lower blood pressure patient with hypertension. Tera gymnastics prioritizes gymnastics breathing, where the movements synchronized with meridian patterns with dots health according to the theory of acupuncture. If gymnastics is well done and true as well regularly in the long term, have an impact positives that can help accelerate healing prevents illness as well. That sympathetic nerve activity is reduced when subject breathe slowly. Physical activity carried out by programmed, measurable, regular and routine can reduce the potential for stress, other than that also able to maintain one's physical fitness (Sukadiyanto, 2010). Tera gymnastics contains two elements therapy physical activity and relaxation. Physical activity is obtained through components of stretching and joint motion whereas relaxation is obtained through the respiratory movement that exists in Tera gymnastics (Sari, 2011). the nurses in improving self-care agency of hypertension patients must concern about patient lifestyle and help patient to modify their lifestyle (Kharisna et al., 2018).

Risk factors that can be changed in patients hypertension is the same as recommended for patients other hypertensive patients such as reduction weight, sodium restriction on food, increased physical activity and reduced intake alcohol. This factor not only reduces the pressure blood but also have a positive impact against the risk of cardiovascular disease. This tera gymnastic exercise is good

physical activity for patient with high blood hypertension.

The tera gymnastic exercise conditioning program achieved effect in this population. Research from Lewa, Pramantara, Rahayujati (2010) showed that the elderly are not active physical increases the risk of HST events of 2.33 times greater than with the elderly who are physically active, and in a manner statistically significant (p-value = 0.003). Investigation of the role of physical exercise regularly to decrease arterial strain center due to age. They found that aerobic exercise and Resistance can regularly inhibit reduction of arterial compliance result increase in age and restore level parallel to the arterial level of age compliance middle-aged. Impact of pressure drop blood because of this sport may be caused by diminished arterial stiffness.

Repetitive exercise with high intensity, the central nervous system will stimulate the muscles and as many muscle fibers as possible resulting in faster contraction, strength and higher endurance. Human body require energy to maintain survival of the body's organs, the process of replacing damaged cells and activity daily. Energy can be defined as capacity or ability to perform work. Work is defined as a style done at a certain distance.

Conclusion

The reduction of blood pressure after exercise is of great clinical relevance. Which is compatible with observational studies that concluded that exercise and fitness are inversely related to the later development of hypertension. Although there are fewer data on resistance training, the data suggest that resistance training of moderate intensity is able to reduce blood pressure. Various approaches have been used to increase physical activity and maintain adherence. Our results support the recommendation that exercise is a cornerstone therapy for the prevention, treatment and control of hypertension .The increased risk of physical inactivity in controlling hypertension in our study suggest that general practitioners must be in the habit of prescribing practice of physical exercise. Physical activity has been shown to have beneficial effect on blood pressure. patients are followed up regularly to confirm that they are adhering to the management plan and the blood pressure targets.

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Relationship between Workload Performance and Job Satisfaction

Aasma Safdar[1], F. Sri Susilaningsih[2], Titis Kurniawan[3]
[1]New Advance College of Nursing, Lahore, Pakistan
[2,3]Faculty of Nursing Universitas Padjadjaran, Bandung, Indonesia
Corresponding Email: asmasahota@gmail.com

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Abstract

In Pakistan's public health care delivery system, charge nurses hold a very challenging position to perform their workload. They have to work very hard to accomplish nursing and non-nursing care tasks which are imposed on them by the system. Overstretching of workload deprives them from concentration which is badly needed for their performance and this creates dissatisfaction which negatively impact on the quality of nursing care. As a result, this study intends to analyses the relationship between workload performance (WLP) and job satisfaction (JS). This correlation study involved 105 charge nurses in Nishtar Medical College and Hospital Multan Pakistan recruited by convenience sampling. Nurses' WLP were collected by using self-developed instrument, and JS were collected by using modified Spector 1985. The collected data were analyze descriptively (mean, SD, frequencies, percentage) and inferentially (Pearson's correlation). The results suggested that nurses' WLP (average time consumption) in the morning (93.83%) and evening shift (95.63%) were higher compared with night shift (70.69%). Additionally, the proportion of time consumed in the morning and evening shift were higher on nursing care activities (Morning = 57.10%, Evening =52.1%) rather than non-nursing care activities. Oppositely, in the night shifts nurses consumed more than half of their time in non-nursing care activities (55. 66%). Charge nurses observed on moderate level of job satisfaction (mean = 38.6, SD = 5.42). There was no statistically significant correlation between nurses' job satisfaction and workload performance (p =.137). The findings conclude nurses' high workload and moderate level of job satisfaction and no statistically significant correlation between both. The results suggested that, it is important for hospital management to adopt some better strategies in order to improve WLP and JS.

Keywords: Job satisfaction, nursing & non-nursing care activities, workload performance.

Introduction

Nurses are the key care providers in hospitals, they can significantly influence the quality of care provision and patient outcomes. Consequently, hospitals' chase of high-quality patient care is based on their ability to engage in some activities that will ensure use of nursing resources effectively (Stokowski, 2009).

According to Lunden (2014), the role of nurses in transforming healthcare is vital in promoting and restoring patients' health through completing the nursing process. This is achieved with nurse collaboration with physicians and multidisciplinary team members to providing physical and psychological support to patients and their families, therefore ensuring job satisfaction, which is a major element for measurement of nurses' workload performance. Draper, Felland, Liebhaber, and Melichar (2008) say "Nurses care for patients in a multitude of ways, and can move into leadership roles in clinics and hospitals with responsibility for overseeing other health care team members. Where they provide hands-on care to patients by administering medications, managing intravenous lines, observing and monitoring patients' conditions, maintaining records and communicating with doctors".

Snyder, Medina, Bell, and Wavra (2004), asserted that Nurses have to determine the scope of nursing practice, with the responsibility and accountability of provision of nursing services and provide basic patient care that includes but is not limited to taking vital signs, dressing changes, performing phlebotomy, and assisting with activities of daily living. In Pakistan Charge Nurses (CNs) are overburdened with workloads, spending more time in managing the inventories of stock registers, such as general over, linen over, medicine over, etc. besides providing nursing care to patients nurses are occupied with multiple non-nursing tasks, where they have to manage and account for item ranges from needle to oxygen cylinder; from bed sheet to the bed fixing; from receiving the medicines to the distribution and maintaining all kind of stock registers with the constant updating records. Chauhan (2014), stated that medical sector in Pakistan has historically been more preoccupied with cure rather than care, the existing nurse- patient ratio in Pakistan is approximately 1:50 whereas the ratio prescribed by the Pakistan Nursing Council (PNC) is 1:10 in general areas and 2:1 in specialized areas.

Hamid, Malik and Ramzan, (2013) reported that most dissatisfying factors at work and within the work setting are high workload.

There is paucity of literature in Pakistan on workload performance & job satisfaction, this study is important as it was the first attempt to study the measurement of nursing workload performance for nursing and non-nursing care activities.

This relationship is reciprocal, meaning people who are satisfied with life tends to be satisfied with their job and people who are satisfied with their job tends to be satisfied with life. Therefor it's important to further study the overload work performance in the context of nursing and non- nursing care activities of nurses and its relation with their job satisfaction. As a result, there would a drive in the authorities' to bring some change in policy in order to divide the task by various personals. This will be helpful to raise the quality of health care delivery system

Method

A descriptive cross sectional study with method of primary data collection was adopted to extract information from all charge nurses working at Nishtar Medical College & hospital Multan, Pakistan. Sample size collection prevalence (p) was assumed 50% with confident interval of 95 % (z=1.96) and Q was 1-p, margin of error is assumed to be 10% on the basis of this my sample size is 96 additional 10% is added for refusals the total sample size is 105 recruited by convenience sampling. The questionnaire validity was checked on same group of charge nurses by the consultations of professionals in the field. Reliability study was conducted using Cronbach's alpha. Nurses' Workload performances were collected by using self-developed instrument, and Job Satisfaction were collected by using modified Spector 1985. The collected data were analyze

descriptively (mean, SD, frequencies, percentage) and inferentially (Pearson's correlation).

Results

Table 1 Characteristics of The Respondents (n=105)

Characteristics	Frequencies	Percentage
Marital status		
Married	53	50.5
Unmarried	49	46.7
Divorce	3	2.9
Professional qualification		
Charge Nurses (CNs)	62	59
CNs with (DWA)	4	3.8
CNs (DTA)	2	1.9
CNs with BSc Nursing	31	29.5
CNs with other then nursing qualification	6	5.7
Job experience		
< 1–5 years	55	52.4
6–10 years	34	32.4
11–15 years	11	10.5
16>20 years	5	4.8
Present placement		
Medical unit	11	10.5
Surgical unit	22	21
Pediatric unit	15	14.3
Obstetrics	11	10.5
Emergency unit	7	6.7
Cardiac unit	10	9.5
Other	29	27.6
Present shift		
Morning	49	46.7
Evening	29	27.6
Night	27	25.7
Age (Years)		
Mean	(29.47) SD (5.50)	
Minimum – Maximum	25–45	

Table 2 Total average time of WLP /per unit (Nursing and Non-nursing care activities)

Shifts	Average Total amount of time	Percentage	Total actual time* persons on duty in a unit	Total Nursing care activities average minutes and percentage	Total Non-nursing care activities average minutes and percentage
Morning (n=49)	309,22	93.83	360*3=1080	205.57 (57.10%)	132.24 (36.73%)

Evening (n=29)	344.29	95.63	360*3=1080	187.51 (52.1%)	156.78 (43.56%)
Night (n=27)	508.98	70.69	720*2=1440	305.46 (42.43%)	203.51 (55. 66%)

Table 3 Frequency and Percentage of WLP

Shifts	Low than average Frequency (percentage)	Average Percentage	Higher than average Frequency (percentage)
Morning (n = 49)	23 (46.9)	93.83	26 (53.1)
Evening (n=29)	14 (48.2)	95.6	15 (51.7)
Night (n=27)	16 (59.2)	70.6	11 (40.7)

Table 4 Level of Job Satisfaction

Shifts	Lower than average Frequency (percentage)	Average	Higher than average Frequency (percentage)
Morning (n = 49)	24 (48.9)	38.32	25 (51.0)
Evening (n=29)	12 (41.3)	38.14	17 (58.6)
Night (n=27)	14 (51.1)	39.89	13 (48.I)

Table 5 Correlation Between The WLP and JS as per shift

Shifts	WLP Total average minutes	JS Total average score	r	p value
Morning	309.22	38.32	-.058	0.69
Evening	344.29	38.13	0.21	0.26
Night	508.98	39.88	0.086	0.67

Table 6 Correlation Between The WLP and JS (n=105)

WLP Total averages minutes	JS Total average score	r	P value
383.64	38.68	0.146	0.137

Characteristics of Respondents

The study also considered some other vital information in the demography which includes designation, job experience, professional qualifications, present placement and present shift.

Table 1 shows that half of the respondents were married (50.5), more than half were charge nurses (59%) with nonspecific qualification, while half of the respondent's Job experience (50.4%) were <1-5 years, where (27.6%) respondents were placed in other departments of the hospital, almost half (46.7%) were on morning shift duty, and minimum age respondents recorded 25, maximum age were 45 with the 29.45 mean and 5.50 SD.

Nursing Workload Performance

Table 2 describes that the average time and percentage, charge nurses spend to achieve their workload performance in their three shifts and average time is divided with the no of persons who were present on shift in per unit because the nursing and non-nursing tasks(workload) were assigned to all nurses

who were deployed in unit, further to get actual workload the work also distributed on persons who were present on shift in a unit, so the actual minutes 360 minutes of morning, evening and 720-night shift multiplied with the no of charge nurses present in one unit in each shift to achieve the real minutes of WLP.

Table 2 represented that the respondents in morning shift (93.83 %) and evening shift (95.63 %) consumed almost full of time to accomplish their workload performance, as compare to night shifts where workload is low (70.69 %). To perform nursing care activities respondents reported more the half of time consumed (57.10 %) in morning shift, (52.1 %) in evening shift while less than half time consumed (42.43 %) in night shift, to perform non-nursing care activities the scenario is opposite, respondents consumed less time in morning and night shift and more in night shift.

Table 3 indicates that respondents from morning (53.1 %) and evening (51.7 %) shifts reported that consumed more than half of, above then average time consumed in WLP, where respondents from night shift resulted more than half of time lower than average (59.2 %) consumed to accomplish WLP.

Job Satisfaction

Table 4 indicates that the average moderate level of job satisfaction of respondents in all three shifts from the total score of 75.

Table 6 shows that correlation between morning shift WLP and JS (r =-.058), while their correlation between evening shift WLP and JS (r =.21).

Table 6 indicates that, there is no statistically significant correlation between WLP & JS with the .137 p value.

Discussion

The purpose of this study was to examine the relationship between job satisfaction and workload performance (nursing care activities and non-nursing care activities) of charge nurses of Nishtar Medical College & Hospital Multan. This chapter discusses the findings of the research questions surrounding characteristics of the respondents, workload performance for nursing care activities and non-nursing care activities, and job satisfaction, in addition, relationships between these variables are compared and contrasted with other research findings on the same topics.

The study aimed to figure out the workload performance which resulted that charge nurses consumed full of their time more than 90 % to accomplish their tasks in morning and evening shift as contrast with night shift average time consumed (70.69 %) which means workload is high in morning and evening this results contrasted with Debergh et al. (2012) study of measurement of workload per shift in the ICU where researcher measured nursing care activities per shift was (85.5 %). In general nursing workload recorded high in ICU as compare to other departments, whereas this study recorded higher workload then ICU from all department of the hospital.

The study findings observed the proportion of time consumed on nursing and non-nursing patient care activities, charge nurses consumed more than half of their time (Morning =57.10%, Evening =52.1%) to perform nursing care patient activities whereas less than half time (Morning = 36.73%, Evening =43.56%) to perform non-nursing care activities, actually nurses in Nishtar Medical college and hospital have higher non-nursing activities workload but sometimes they took medicine expense register to their home to complete their tasks and most of the time they keep forward to night shift as evident in table 4.2 non-nursing activities recorded (55.66%) average time in night shift.

In addition, findings of the study recorded that charge nurses spend lowest minimum average time on 7.429 minutes for making nursing care plan and highest maximum average time 82.86 minutes for medicating the patients for nursing care activities, which means charge nurses don't have enough time to make appropriate nursing care plans, conceptually & factually it's not possible to make nursing care plans of one unit patients which are 40 to 80 in number within 7.429 minutes.

For non-nursing care activities this study recorded charge nurses spend minimum average time in writing of demands of supplies and maximum average time (102.33

minutes) on managing medicine expense, similarly Jackson Healthcare (2012) reported that about 78% of nurses testified spending at least two hours (120 minutes) per shift on non-nursing care activities (Documenting information in multiple locations, Completing logs, checklists, and collecting data, Traveling to equipment, supply, and utility rooms, and Entering and reviewing orders). Whereas this study recorded charge nurse's maximum average time (203.51 minutes) which means three and half hours (Reference table is available in appendix).This study intended to weigh the level of job satisfaction of charge nurses of Nishtar Medical College and Hospital Multan which concluded total job satisfaction mean 38 .86 in all three shifts, which indicates nurses on a moderate level of job satisfaction despite of any shift, findings of this study are contradicted to Jaiswal et al. (2015) which reported job satisfaction rate highest (68%) among nurses.

Job satisfaction seems like a complex phenomenon as this study evident that the 15 item of job satisfaction (scored 1 low to 5 high) the 4 items of JS, equitable benefits, rewards, job is enjoyable & adequate opportunity to utilize and update skills and talent, was scored between >3 & >4 which suggest the high level of satisfaction with these items, while 8 items of JS, salary ,communication within the organization, organizational supervision system, appreciation of work, co-workers, sense of pride, and bickering/ fighting at work were scored >2 & <3 which suggested the moderate level of job satisfaction of these items, and 3 items of JS heavy paperwork, high workload, and chance of promotion were scored very low>1 & <2 which suggested charge nurse are not happy at all with high workload, high paperwork and chances of promotion therefor these items scored very low. Perhaps one of the interesting results of this study shows that the age, marital status, job experience, and present placement of the respondents were not influence the workload performance and job satisfaction of charge nurses. Hence the present shift of the respondents recorded the different level of workload of nursing and non-nursing care activities.

The exciting finding on professional qualification have the effect on job satisfaction as this study evident that the charge nurses with higher nursing education also such as BSc Nursing table 4.1 (29.5%) were also deputed as charge nurses which supposed to be on higher rank according to their qualification, therefore the job satisfaction (item no 2: there is really little chance of promotion on my job) scored very low 1.2 out of 5 which indicates charge nurses are not satisfied with their chance of promotion.

In general this study aimed to figure out the relationship between workload performance and job satisfaction which statistically proved that there is no significance correlation between workload performance and job satisfaction despite of all three shifts with the p value (.137) among the charge nurses, the study didn't proved the significant correlation as researcher did not control the other factors that also contribute job satisfaction as literature proved that there are several factors control job.

Strength and Limitation of The Study

The strength of the study was the questionnaire that used in this study was validated by three experts, and statistically had acceptable reliability score.

Satisfaction of nurses working in tertiary level Health care settings in Pakistan Bahalkani, Kumar, Lakho, Mahar, Mazhar, and Majeed (2011) found 86% respondents were dissatisfied their job due to the poor work environments, poor fringe benefits, dignity, responsibility given at workplace and time pressure, and Poor lack of training opportunities, proper supervision and Sultana, Riaz, Mahmood, and Khursih, (2011) also observed 37.14% nurses least satisfied with their job in the context of working environment, dealing of health care professionals with nurses, and attitude of the patients and their attendants towards nurses. Further, the set of data were used in this study were homogeneous in nature therefore it was difficult to find the strong significant correlation.

The financial resources were limited due to that the generalization of the findings remain limited and different findings possibly were found in other settings, particularly the setting with varies health care delivery model.

Conclusion

Firstly, this study assess the proportion of time consumed on nursing and non-nursing patient care activities the findings concluded that charge nurses in morning and evening shift consumed more than half of their time to perform nursing care activities and less than half time to perform non-nursing care activities, which is opposite to night shifts where nurses consumed more than half of their time in non- nursing care activities.

Secondly this study intends to weigh the level of job satisfaction of charge nurse and findings concluded that charge nurses are on moderate level of job satisfaction.

Thirdly the study results observed that there is no significance correlation between workload performance and job satisfaction among charge nurses of Nishtar Medical College and Hospital.

It is clearly evident from this study that charge nurses consumed their full time on workload performance and > 40% average time on conducting non-nursing care activities, which are related to record keeping of expenses of various supplies manually, therefor its strongly recommended the adaptation of Electronic Health records & Management information system it could be brought to further minimize the level of workload and nurses could be able to provide quality nursing care with the higher level of job satisfaction. Further it's suggested to hospital management to adopt some better strategies to overcome nurse's workload and improve nurse's job satisfaction level moderate to highest.

The study provided a research base evidence for nurses and other professional healthcare provider, university member, and researcher for further research and knowledge development.

In Future empirical work needs to test and examine how addressing with different contributing factors might foster nurses' job satisfaction with their workload performance within the hospital and also researcher recommends that this study should be replicated in vary/multi setting with the bigger number of sample measurements in Pakistan in order to further clarify and strengthen the evidences to maximize the benefits for nursing care services in order to provision of quality care.

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An Exploration the Risk of Cardiovascular Disease in HIV-Positive Persons in Indonesia using Heart Rate Variability

Linlin Lindayani[1], Irma Darmawati[2], Heni Purnama[3], Pujowati[4], Taryudi[5]
[1,2,3] STIKep PPNI West Java, Bandung, Indonesia
[4]RSUP Hasan Sadikin, Bandung, Indonesia
[5]Faculty of Electrical Engineering, Universitas Negeri Jakarta, Jakarta Indonesia
Corresponding email: linlinlindayani@gmail.com

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Abstract

Cardiovascular disease is the highest cause of death in HIV patients compared to the general population. The number of HIV patients suffering from cardiovascular disease is almost twice as high as patients who are not HIV-positive. The purpose of this study was to identify the risk of cardivascular disease in patients with HIV using ECG short term. This study was used a descriptive comparative to patients with HIV and healthy people as controls in West Java. The inclusion criteria are patients with HIV over the age of 30 years. The exclusion criteria were people with HIV diagnosed with heart disease or being treated for the heart disease. While the inclusion criteria for healthy people as controls are over 30 years of age, do not suffer from cardivascular disease or under treatment of cardiovascular disease. The measurement of heart rate variability is carried out in a supine position in a quiet temperature-controlled room (25-270 C), a 5-minute electrocardiograph (ECG) is recorded using lead II. Differences of heart rate variability indicator were measure using man-whitney test. A total of 20 patients with HIV and 20 healthy people recruited using convinience sampling. The majority of people with HIV were male and aged range between 27 to 51 years old. The results of heart rate variability based on time domain analysis showed that the means normal to normal (NN) was significantly lower in HIV patients compared to controls (978 vs ?? vs 902 ms; $p<0.05$). No differences were found between groups regarding Standard deviation of NN (SDNN), Square root of the mean squared difference of successive NN-intervals (RMSSD) and Percent of differences between adjacent NN intervals greater than 50 ms (pNN50). This study presence of autonomic dysfunction as showed in heart rate variability indicator in a group of HIV compared to the healthy group. Eearly identification of the risk of CVD is important and may inform the implementation of preventive measure by identification of high-risk people who may be candidate for intervention.

Keywords: Cardivascular disease, HIV, heart rate variability, HRV, risk estimation.

Introduction

Cardiovascular disease is the leading cause of death not only in general population but also in patients with HIV (Human Immunodeficiency virus). Because of its high mortality rate, cardiovascular disease receives a major concern in the care and management of patients with HIV, especially those under antiretroviral therapy (ART). Previous research reported that there was a shift on the trend of caused of the death of patients with HIV. In the era before ART (pre-ART) was found only 5% of deaths caused by heart disease, but now, in the era posts-ART, 32-42% of HIV patients die due to heart disease (Krentz, Kliewer, & Gill, 2015; Palella et al., 2016). Patients with HIV have 1.5 to 2 times the cardiovascular risk compared to people who are not infected with HIV and that increases with age (Chow et al., 2015; Triant, Lee, Hadigan, & Grinspoon, 2007). Another study reported that about 58.3% of patients with HIV had at least one cardiovascular risk factor and 18.9% had two and more cardiovascular risk factors (Soliman et al., 2015). The risk of cardiovascular disease continues to increase in patients with HIV on ARTcabout 74.4% and 25.6% of naïve ART (Nsagha et al., 2015). In addition, the increased risk of heart disease in HIV patients is related to lifestyle and risk behavioral factors such as high rates of smoking, alcoholism, and drug use, and obesity (Grundy, 2016).

Heart rate variability (HRV) is a very sensitive tool for measuring the autonomic tone of the heart. It reflects beat-to-beat changes in RR intervals, which are related to ongoing interactions between two autonomic nervous system arms (Mittal, 2004). Heart rate changes can occur in response to mental or physical stress, heart or non-cardiovascular disease, or pharmacological or invasive treatment. Imbalance of the autonomic nervous system with a shift toward increased sympathetic and decreased vagal tone has been shown to be associated with a higher risk of cardiac death. Therefore HRV becomes an important and well-known tool in identifying patients who are at cardiovascular risk (Sakhuja, 2007). By recording heart activity through an electrocardiogram (EKG) for 5 minutes can detect a person's risk of heart disease. HRV is easy to do, convenient, non-invasive to patients, and also inexpensive (Mittal, 2004). It is able to detect the effects of external interference. Previous studies conducted in Denmark reported that there was a moderate autonomy disorder in HIV patients as measured by HRV (Askgaard, 2011; Wongcharoen, 2013). Several studies have shown that the statistical, geometrical, spectral and nonlinear analysis of HRV is a powerful tool for cardiovascular evaluation (Correia, 2006; Melillo, 2015).

In Indonesia there are still few studies that focus on early detection of cardiovascular disease in the general public (who are not infected with HIV) or HIV patients, whereas heart disease (a type of cardiovascular disease) is the first killer of Indonesian society. Thus, early detection and early prevention interventions for people at high risk in routine practice to reduce the incidence of cardiovascular disease are very necessary. So the purpose of this study was to identify the risk of cardivascular disease in patients with HIV using ECG short term.

Method

Study design

This study was used a descriptive comparative aims to identify CVD risk using ECG short term, namely HRV indicators in patients with HIV compared with healthy people

Population and Samples

The population in this study were patients with HIV and healthy people as controls in West Java. The inclusion criteria are diagnosed with HIV confirmed by medical record, age over 30 years, not diagnosed from heart disease or being treated for the heart disease. The inclusion criteria for healthy people were age over 30 years, not dignosed with cardivascular disease or receiving treatment of cardiovascular disease. Exclusion criteria are pregnant women, people with diabetes mellitus, and menopause. The sample technique that will be used is convinience sampling due to resource constraint. A total of 40 participant that consist of 20 patients with HIV and 20 healthy people were recruited

in this study. Approval of ethical permission was obtained from the afiliated univeristy.

Measurement

Demographic data and medical history were collected using standard forms. Demographic data collected includes age and gender. Medical history including self-reported of years living with HIV and Under ART, and current CD4 counts.

Physical examination includes systolic and diastolic blood pressure, height, and weight. Blood pressure was measured by nurses through the brachial artery using a digital sphygmomanometer with an adult cuff on the day of data collection. The patient sits in an upright position in a quiet room; two consecutive blood pressure measurements were taken, and the average was recorded as the final result. Blood pressure is defined as high if systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg (Pickering, 2005). Subjects were defined as thin if the BMI (body mass index) ≤18.5 kg / m2, normal (BMI ranging from 18.5 to 24.9), being overweight (BMI starting from 25.0-29.9), and obesity (BMI ≥ 30).

The measurement of heart rate variability is carried out in a supine position in a quiet temperature-controlled room (25-270 C), a 5-minute electrocardiograph (ECG) is recorded using lead II. The following five tests were carried out to assess autonomic function (Miller, 1987): 1) Stand active: Blood pressure is measured in the supine position and immediately after active standing. Blood pressure and heart rate response and the ratio of 30:15 (the ratio of the longest R-R interval of about 30 beats and the shortest interval of R-R is calculated to be about 15 beats); 2). Deep breathing: expiration: inspiration ratio (E: I) and changes in heart rate measured during deep breathing; 3). Static grip test: Blood pressure response during isometric exercise is measured; 4). Cold pressor test: Blood pressure response to soak hands in ice cold water is assessed; 5). Cold face test: The response of blood pressure during the application of cold packs to the face is measured.

Data analysis

The Kolmogorov-Smirnov test of all variables was performed to test the normal distribution assumption. As the results of normality test found not normally distribute, therefore all the test was conducted using non parametric test. Comparisons between groups were performed using the Fisher exact test for binomial data (2x2 contingency tables) and the Mann-Whitney test for continuous data. Correlations were analyzed using non-parametric (Spearman) correlation and expressed by Spearman's rho. P <0.05 was considered significant. P values between 0.05 and 0.1 are considered to be significant limits.

Table 1 Comparation of Demographic and Clinical Characteristics of Study Groups

	HIV group (n=20)	Control group (n=20)	Significance
Gender (%)			
Male	11 (55)	12 (60)	0.12
Female	9 (45)	8 (40)	
Age (years)	43 (27–51)	42 (29–56)	0.43
Body Mass Index (kg/m2)	25 (23–27)	25 (24–28)	0.32
Diastolic blood pressure (mmHg)	76 (69–81)	74 (67–89)	0.54
Systolic blood pressure (mmHg)	123 (116–134)	125 (115–139)	0.67
Duration of HIV (years)	9.1 (5.8–14.3)	-	-
Duration of ART (years)	7.3 (3.6–8.1)	-	-
CD4 cell cound (cell/mm3)	432 (342–676)	-	-

Note: ns: non significance.

Table 2 Heart Rate Variability Based On Time Domain Analysis

	HIV group (n=20)	Control group (n=20)	Significance
Mean NN (ms)	902 (845–987)	978 (891–1,113)	P<0.05
SDNN (ms)	45 (37–67)	51 (43–76)	0.13
RMSSD (ms)	29 (20-48)	26 (22–40)	0.47
pNN50 (%)	5(1–20)	4 (1–8)	0.32

Note: Values are median (25 percentile–75 percentile).

Results

A total of 20 patients with HIV and 20 healthy people. The majority of people with HIV were male and aged range between 27 to 51 years old. While, in control group, majority were male and aged ranged 29 to 56 years old. The mean duration of living with HIV was 9 years (range 5.8–14.3). There were no significant different between HIV group and control group (healthy people) in tearm of age, gender, body mass index, systolic and diastolic blood pressure (Table 1).

The results of heart rate variability based on time domain analysis is described in Table 2. The means mean normal-to-normal (NN) was significantly lower in HIV patients compared to controls (978 vs vs 902 ms; $p<0.05$). No differences were found between groups regarding Standard deviation of NN (SDNN), Square root of the mean squared difference of successive NN-intervals (RMSSD) and Percent of differences between adjacent NN intervals greater than 50 ms (pNN50).

Mean NN: mean normal-to-normal, SDNN: Standard deviation of NN; RMSSD:

Square root of the mean squared difference of successive NN-intervals; pNN50:

Percent of differences between adjacent NN intervals greater than 50 ms.

Discussion

Our study presence of autonomic dysfunction in a group of HIV compared to the healthy group. Decrease in mean NN indicating a decrease mainly in parasympathetic tone (Askgaard, 2011). Some evidence has reported that there is an increased risk of cardiovascular disease in HIV patients (Freiberg et al., 2013). A recent analysis of HIV patients aged 30-50 years using bilateral intima-media (cIMT) found that 19.2% of HIV-infected patients had an increased risk of cardiovascular disease (Mosepele et al., 2017). A study from the Netherlands reported that around 33% of HIV patients measured by FRS had a high risk of cardiovascular disease (Krikke et al., 2016). This was supported by a cross-sectional study conducted in Croatia (n = 254) reporting that people with HIV had a high risk of CVD, ranging from 27.2% measured by FRS to 51.6% for DAD scores (Begovac et al., 2015). A study from Zimbabwe in HIV-positive people (n = 215, mean age = 39.8-42.0, under ART 3.9 (SD = 3.4)) also reported 1.4% prevalence of high risk cardivascular disease in the next ten years (Zhou et al., 2015).

The underlying mechanism by which HIV driving excess CVD risk is not clear but likely involves a combination of factors including the virus itself, side effects of cART and the burden of traditional risk factors. HIV infection is associated with an increased risk of CVD surrogate marker, such as carotid intima-media thickness, arterial stiffness, endothelial dysfunction (Obel et al., 2007; Oliviero et al., 2009; van Vonderen et al., 2009). In addition, cART increased risk of CVD by elevating LDL, total cholesterol, triglyceride, and HDL (Kiage et al., 2013; Nsagha et al., 2015). Moreover, the increasing vulnerability of CVD depending on lifestyle and risk behaviors factors such as smoking, alcoholism, and illicit drug use, as well obesity (Grundy, 2016).

Heart rate variability (HRV) is a very sensitive tool for measuring the heart's autonomic tone. Previous studies conducted in Denmark reported that there was moderate autonomic disorder in HIV patients measured using HRV (Askgaard, 2011 & Wongcharoen, 2013). Previous study shown that statistical, geometric, spectral and nonlinear analyzes of

HRV are powerful tools for cardiovascular evaluation (Binici, 2011). Heart rate variability (HRV) reflects beat-to-beat changes in RR intervals, which are related to ongoing interactions between two autonomic nervous system arms (Mittal, 2004). The sinus node, the main pacemaker, presents its own intrinsic activity; however, various internal and external stimuli that change the balance between sympathetic and vagal tone affect the final base heart rate. Heart rate changes can occur in response to mental or physical stress, heart or non-cardiovascular disease, or pharmacological or invasive treatment. Imbalance of the autonomic nervous system with a shift toward increased sympathetic and decreased vagal tone has been shown to be associated with a higher risk of cardiac death. Therefore HRV becomes an important and well-known tool in identifying patients who are at cardiovascular risk (Sakhuja, 2007). HRV measurement becomes an important tool in detecting damage and predicting autonomic prognosis in several neurological disorders as well. Heart rate (HR) has been extensively studied in cardiac patients, especially in patients with acute myocardial infarction (AMI) and also in patients with congestive heart failure (CHF) or left ventricular dysfunction (LV). The majority of studies have shown that patients with reduced or abnormal HRV have an increased risk of death within a few years after AMI or after the diagnosis of CHF / LV dysfunction. Various methods used for HRV measurement such as time domain, spectral, and non-linear have been used in risk stratification.

Conclusion

Our study found a presence of autonomic dysfunction as presented in heart rate variability analysis in patients with HIV indicating decreased in the parasympatic tone of the heart. Althought others parameter in heart rate variability were not significantly different between HIV group and healthy group. Eearly identification of the risk of CVD is important and may inform the implementation of preventive measure by identification of high-risk people who may be candidate for intervention.

The authors declare that they have no competing interests.

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Knowledge, Attitude and Practice of Evidence-Based Nursing Practice and Barriers

Dwi Novrianda, Hermalinda
Faculty of Nursing, Universitas Andalas, Padang, Indonesia
Corresponding email: dwinovrianda@nrs.unand.ac.id

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Abstract

Professional nurses, one of the human resources in the health sector, are obliged to carry out the nursing process, especially nursing, based on scientific evidence. This study aimed to describe the knowledge, attitudes, and practice of evidence-based practice and its barriers to the hospital. Quantitative research with a descriptive approach was conducted at Dr. M. Djamil Hospital, Padang. A consecutive sampling technique was utilized, with 139 selected nurse practitioners, and only 90 nurses filled in the questionnaires. The instruments used were Evidence-Based Practice Profiles (EBP2) and the BARRIERS Scale. Characteristics of respondents were 70.0% diploma education; mean age was 36.7 (SD=7.95) years and 13.35 (SD=8.37) years of working time. The mean attitude towards EBP was higher than the mean of EBP knowledge/understanding, confidence, understanding of research terms, and practice towards EBP (3.32; 2.93; 2.72; 2.53; 1.95). Therefore, there is a definite need for improving knowledge, comprehending EBP, and research terminology to overcome the obstacles of EBP implementation in the nursing service practice.

Keywords: Attitudes, barriers, evidence-based practice, knowledge, implementation.

Introduction

Human resources are one of the input subsystems to achieve the goals of the health system. An important focus in human resources is the development and enabling of human resources as well as improving the quality of human resources in the health sector. Human resources in the health sector have the right to fulfill their basic needs (human rights) as social beings, competence, and the authority to dedicate themselves in the fields of health, ethics, moral noble, and specialized in duty.

Professional nurses are one of the human resources in the health sector. Nurses must carry out the nursing process, especially nursing interventions based on scientific evidence. It is line with the opinion of Mahanes, Quatrara, and Dale (2013) that nurses are expected to stay up to date on a large number of institutional initiatives, best practice guidelines, and policies and procedures.

In nursing, evidence-based practice is essential to provide high-quality care. The Institute of Medicine (IoM) claims that Evidence-Based Practice (EBP) is very important in improving and ensuring the quality of health services (Rn, Knops, Ubbink, & Rn, 2013). The IOM study in 2001 reported that patients received recommended evidence-based treatment measures only as much as 55% (Anne & Woods, 2013). In contrast, according to Bach (2005), evidence-based practice in the care of the general population is provided for only 50% (Wood & Payne, 2012). In the nursing profession, research findings as new information will be incorporated continuously in nursing practice (Pipe, Wellick, Buchda, Hansen, & Martyn, 2005). Unfortunately, nurses faced real challenges when translating the best evidence in clinical practice (Pipe et al., 2005; Boström, Rudman, Ehrenberg, Gustavsson, & Wallin, 2013). Several studies have been conducted to find out about knowledge, attitudes, and awareness about EBP in various countries (Rn et al., 2013; White-Williams et al., 2013; McKenna, Ashton, & Keeney, 2004). Furthermore, a literature review of 37 articles found five obstacles, namely clinical characteristics, nursing education, research habits and reading literature, facilitation of research use, and its relevance to nursing staff and clinical practice (Athanasakis, 2013). A study showed that among surgeons, 90% was familiar with the term EBS, whereas nurses were only 40%. Common barriers for surgeons were contradictory results (79%) and inadequate reporting methodology (73%), and for nurses was EBS unconsciousness (67%) and unclear research reports (59%) (Legemate & Ubbink, 2009).

Since the establishment of the Nursing Science Program, Universitas Andalas has introduced research on nursing students. Students have been instructed to disseminate the results of their study in the field of nursing. It was based on the Nursing Academic Curriculum 2009, 2012, and has been supported by qualified nursing tutors who are at the master and doctoral level. Based on the 2009-2013 Nurse Curriculum, there are literature review lecture sessions, which expose nurses to research articles and the importance of practice based on scientific evidence. However, there is no accurate data on the extent to which nurses' knowledge and attitudes are related to evidence-based practice and how evidence-based nursing practice is applied.

Little information is known about the use, knowledge, and attitudes towards EBP, including its barriers among nurses in hospitals in Padang. Therefore, it is necessary to study the knowledge, attitudes, and factors affecting evidence-based nursing practice (EBNP) among nurses in hospitals.

Further, based on observations, it found that the majority of hospital-nurses rarely used evidence-based practice (EBP). When asked by the researcher, some of them did not comprehend the importance of EBP. Thus, research is needed so that relevant policies and strategies can be recommended based on research findings. This study aimed to determine the knowledge, attitudes, implementation, and constraints towards evidence-based practice in nurse practitioners.

Method

The research design was quantitative with a

descriptive approach. Consecutive sampling of nurse practitioners at Dr. M. Djamil Hospital, Padang, was conducted from August 1 to August 30, 2017. Eligibility criteria required individuals to have work experience equal to or more than one year in the hospital. The number of questionnaires distributed was 139 and returned as many as 119.

Moreover, the research response rate was high at around 85.61%. Furthermore, of the 119 questionnaires returned, some personal data were found to be incomplete, and only 90 questionnaires were completed in full on evidence-based practice and barrier scale. Thus, the data analyzed were only 90.

The instrument used the Evidence-Based Practice Profile (EBP2) questionnaire (McEvoy, Williams, & Olds, 2010) and BARRIERS Scale (Wang, Jiang, Wang, Wang, & Bai, 2013). EBP2 has 58 items arranged in five domains, namely understanding EBP (4 items), attitudes towards EBP (17 items), comprehending research terminology (17 items), practice (9 items), and self-confidence (11 items). The BARRIERS scale, which includes 29 questions about obstacles of applying research to practice in a healthcare setting, uses five scales (Legemate & Ubbink, 2009). The questionnaire is in English, translated into the Indonesian language by the process of forward-backward translation. The validity and reliability of the instrument were not undertaken since previous studies revealed that both instruments were useful, valid, and reliable to use (McEvoy et al., 2010; Wang et al., 2013).

All data management and analysis were managed using SPPS Statistics 23.0. Data were imported into SPSS and checked for missing values. Numerical variables (EBP understanding/knowledge, attitude, practice, and barriers) were displayed in mean, standard deviation, median, minimum, and maximum, while the respondents' characteristics were summarized by number and percentage.

Results

Table 1 Description of Respondents Seen From Age, Gender, Recent Education, Work Experience, and Inpatient Room (n = 90)

Characteristics	f	Mean	SD	Min	Max
Age (years)	84	36.75	7.95	26	58
Missing data	6				
Work experience (years)	78	13.35	8.37	1	37
Missing data	12				
Gender	**f**	**%**			
Male	14	15.6			
Female	65	72.2			
Missing data	11	12.2			
Education					
Senior High School in Nursing	3	3.3			
Diploma	63	70.0			
Bachelor of Nursing & Registered Nurse	13	14.4			
Missing data	11	12.2			
Room					
Pediatric-Maternity	13	14.4			
Surgery	38	42.2			
Non-surgery	15	16.7			

Operation Room	17	18.9
Cardiovascular Care Unit	7	7.8

Table 2 EBP Understanding/Knowledge Responses, Attitude Towards EBP, Understanding of Research Terms, Practice towards EBP and Confidence to EBP

Aspects	Mean (SD)	Minimum	Maximum
EBP understanding	2.93 (0.96)	1.00	5.00
Attitude towards EBP	3.32 (0.51)	1.18	4.35
Understanding of research terms	2.53 (0.79)	1.00	4.00
Practice towards EBP	1.95 (0.91)	1.00	5.00
Confidence to EBP	2.72 (0.44)	1.00	4.18

Table 3 Frequency distribution and percentage of the Barrier scale

No	Subscale and item	Very disagree	Disagree	Neutral	Agree	Very Agree
Nurse subscale: The nurse's research values, skills, and awareness (Adopter)						
	Item	**f (%)**	**f (%)**	**f (%)**	**f (%)**	**f (%)**
1.	The nurse is unaware of the research	10 (11.1)	55 (61.1)	22 (24.4)	3 (3.3)	0
2.	The nurse does not feel capable of evaluating the quality of the research	7 (7.8)	43 (47.8)	36 (40.0)	4 (4.4)	0
3.	The nurse is isolated from knowledgeable colleagues with whom to discuss the research	11 (12.2)	45 (50.0)	31 (34.4)	3 (3.3)	0
4.	The nurse is unwilling to change/ try new ideas	15 (16.7)	32 (35.6)	41 (45.6)	2 (2.2)	0
5.	The nurse sees little benefit for self	12 (13.3)	37 (41.1)	29 (32.2)	12 (13.3)	0
6.	There is not a documented need to change practice	11 (12.2)	39 (43.3)	30 (33.3)	4 (4.4)	6 (6.7)
7.	The nurse feels the benefits of changing practice will be minimal	10 (38)	38 (42.2)	37 (41.1)	5 (5.6)	0
8.	The nurse does not see the value of research for practice	16 (17.8)	34 (37.8)	34 (37.8)	6 (6.7)	0
Setting subscale: Setting barriers and limitations (Organization)						
9.	There is insufficient time on the job to implement new ideas	5 (5.6)	18 (20.0)	57 (63.3)	10 (11.1)	0
10.	The nurse does not have time to read the research	4 (4.4)	21 (23.3)	43 (47.8)	22 (24.4)	0
11.	The nurse does not feel she/he has enough authority to change patient care procedures	6 (6.7)	23 (25.6)	41 (45.6)	20 (22.2)	0
12.	The facilities are inadequate for implementation	6 (6.7)	13 (14.4)	46 (51.1)	23 (25.6)	2 (2.2)

13.	Other staff are not supportive of implementation	3 (3.3)	20 (22.2)	54 (60.0)	13 (14.4)	0
14.	Physicians will not cooperate with implementation	3 (3.3)	35 (38.9)	44 (48.9)	7 (7.8)	1 (1.1)
15.	The nurse feels results are not generalizable to own setting	2 (2.2)	31 (34.4)	50 (55.6)	7 (7.8)	0
16.	Administration will not allow implementation	4 (4.4)	27 (30.0)	52 (57.8)	7 (7.8)	0
Research subscale: Qualities of the research (Innovation)						
17.	The research has not been replicated	0	18 (20.0)	52 (57.8)	20 (22.2)	0
18.	The literature reports conflicting results	0	19 (21.1)	64 (71.1)	7 (7.8)	0
19.	The research has methodological inadequacies	1 (1.1)	31 (34.4)	49 (54.4)	9 (10.0)	0
20.	Research reports/articles are not published fast enough	0	18 (20.0)	52 (57.8)	20 (22.2)	0
21.	The nurse is uncertain whether to believe the results of the research	1 (1.1)	31 (34.4)	52 (57.8)	6 (6.7)	0
22.	The conclusions drawn from the research are not justified	2 (2.2)	21 (23.3)	62 (68.9)	5 (5.6)	0
Presentation subscale: Presentation and accessibility of the research (Communication)						
23.	The statistical analyses are not understandable	1 (1.1)	21 (23.3)	51 (56.7)	17 (18.9)	0
24.	The relevant literature is not compiled in one place	1 (1.1)	18 (20.0)	42 (46.7)	28 (31.1)	1 (1.1)
25.	Research reports/articles are not readily available	1 (1.1)	17 (18.9)	47 (52.2)	25 (27.8)	0
26.	Implications for practice are not made clear	1 (1.1)	19 (21.1)	53 (58.9)	17 (18.9)	0
27.	The research is not reported clearly and readably	1 (1.1)	25 (27.8)	52 (57.8)	12 (13.3)	0
28.	The research is not relevant to nurse's practice	1 (1.1)	26 (28.9)	47 (52.2)	16 (17.8)	0
Items not included in any of the subscales (Others)						
29.	The amount of research information is overwhelming	1 (1.1)	21 (23.3)	44 (48.9)	22 (24.4)	2 (2.2)
30.	Research reports/articles are written in English	6 (6.7)	25 (27.8)	49 (54.4)	9 (10.0)	1 (1.1)

Table 4 Barrier Scale Score

Subscale	Mean (SD)	Minimum	Maximum
Adopter	2.37 (0.60)	1.00	3.75
Organization	2.80 (0.54)	1.25	4.13
Innovation	2.85 (0.47)	2.00	4.00
Communication	2.96 (0.63)	1.00	4.00
Others	2.87 (0.64)	1.00	4.50
Total	2.73 (0.44)	1.70	3.83

Table 1 shows that the average age was 36.75 years. The average nurse has been working in this hospital for 13.35 years, with the lowest and highest working period were one year and 37 years. Almost ¾ respondents were female. More than half of the 70% of respondents' final education was vocational, followed by nursing graduates and registered nurses amounted to 14.4%, and the remaining around 3.3% were senior high school level in the nursing field. Nearly half of the respondents as many as 42% worked in the Operation Room (OR).

Table 2 illustrates the mean, minimum, and maximum of EBP understanding/ knowledge responses, EBP attitude responses, understanding of research terms, actions against scientific evidence-based practices, and confidence in EBP on nurses at Dr. M. Djamil Hospital 2017. The average attitude score on evidence-based practice (EBP) was the highest among the other scores on average. Meanwhile, action against EBP has the lowest average score.

Table 3 describes the frequency and percentage of respondents' answers to the Barrier scale questionnaire. There were 5 (five) subscales of nurse subscale, constraint and limitation subscale, research quality subscale, presentation subscale and accessibility of research results, and item subscale not available on each subscale. Most of the respondents answered disagree and neutral, while some respondents who answered agreed, even strongly agreed with the nurse subscale. Unlike the case with other subscales, the spread of answers was unpleasant, neutral, and amenable.

Table 4 illustrates the average subscale score and the total score of the barrier scale. The subscale of presentation and accessibility of research results as barriers of almost ¾ was low, followed by other item subscales, constraint and constraint subscale, research quality subscale, and consecutive nurse subscales of 70%, 62.2%, 58.9%, and 53.3%. In total, more than half of the barriers were considered low, with an average score of 2.73. Thus, most respondents rated the barrier of the five aspects low, and others felt the barrier was quite high.

Discussion

This study provided knowledge, attitude, understanding of research terms, and confidence to EBP, as well as EBP action on nurses in Padang City. The results showed that more than a few nurses had the same EBP understanding/knowledge response or more than the average score. However, the average score of respondents' understanding of EBP and research terms was in the mid-range of 2.93 and 2.53. In line with research, Rn et al. (2013) reported that nurses had a poor understanding of the term EBP. A possible explanation for this might be that nurses who had learning experience related to research in the educational program were more capable of conducting research (Olade, 2003). The findings seemed to be consistent with other studies which found that nurses' educational level had a statistically significant relationship with their research attitudes (Olade, 2003). Furthermore, previous research revealed that EBP educational interventions have effectively improved the knowledge and skills associated with EBP (Patelarou et al., 2017; Saunders, Vehviläinen-Julkunen, & Stevens, 2016). Besides, education is one of the essential characteristics of nurses because it can affect one's perception, where the higher the level of education, the greater the desire to utilize knowledge and skills in carrying out tasks in a professional manner (Oyoh, Somantri, & Sekarwana, 2017).

Attitudes towards EBP had a higher mean than the mean of knowledge and practice towards EBP, namely, 3.32. Some studies reported that nurses have a positive attitude toward EBP and use of research in practice (Stokke, Olsen, Espehaug, & Nortvedt, 2014; Ammouri et al., 2014; Hussein & Hussein, 2013; Foo, Majid, & Mokhtar, 2011; Rn et al., 2013; White-Williams et al., 2013; Chang, Russell, & Jones, 2010; Wilkinson, Hinchliffe, Hough, & Mphysio, n.d.; Chang et al., 2013; Butler, 2011). A study reported that nurses view the EBP application as an improvement in patient care outcome criteria, research findings are useful in compliance with nursing practice, and EBP encourages patient-centered care (Hussein & Hussein, 2013). The average practice towards EBP was the lowest among others, which was 1.95. In

contrast to the case (White-Williams et al., 2013) in Alabama, the average EBP action score was about two times higher than the current study results, which were 3.41. This was possible due to a higher education level and position as a manager in the workplace so that it had better actions towards EBP. Previous research explained that the need to improve nurses' professional skills through education and training is a fundamental aspect (Oyoh et al., 2017; Rohayani & Banuwati, 2015). Furthermore, Gagan & Hewitt-Taylor (2004) emphasized that the taking and transfer of scientific evidence into practice is difficult and challenging.

Scott and Mcsherry (2008) stated that nurses need to have a good understanding of how to run evidence-based nursing (EBN) and what the concept means and how it differs from other approaches for use in evidence-based actions/practices. Moreover, nurses need to be made aware and involved with the processes associated with obtaining evidence in practice and then identifying what is deemed incompatible with the right to inform their decisions and actions in practice. In this study, note that the average total score for each subscale was in the mid-range of 2.73; 2.96; 2.87; 2.85; 2.80; and 2.37, respectively. It showed, some respondents stated that the barrier felt quite strong, while others felt the barrier was quite low. The nurses' subscale as adopters of grades, skills, and awareness has the lowest average score among other subscales. Nurses considered conducting research worthless and even felt a little benefit of EBP for themselves were the top two things as a barrier on this subscale. However, the nurse item did not want to change/try new ideas, and nurses did not care about the research being the lowest item.

Further to the organizational subscale, it found that inadequate facility items to implement EBP ranked first as a barrier, followed by the limited time for reading study results and the absence of nurse autonomy to change patient care procedures. This finding is consistent with Brown, Wickline, Ecoff and Glaser (2009), who reported that organizational barriers, such as lack of time and nurse autonomy, are the main perceived barriers. Lack of facilities such as unprepared information technology (IT) and library facilities can hamper the implementation of EBP. Also, Eizenberg (2010) pointed out that one of the variables that emerge as EBNP predictors is organizational support, whereas EBNP is more prevalent in workplaces providing computer and internet facilities. Previous research reported that nurses feel satisfied with the support of the team and organization in the form of ease of obtaining and using facilities and advice and assistance in providing nursing services to improve the quality of nurses' work (Somantri & Yudianto, 2018).

The current study found that the second-highest mean score was the limitation of time to implement new ideas and read articles research. Unlike the previous findings Mehrdad, Salsali, and Kazemnejad (2008), the lack of time was felt to be the fifth most frequently cited barrier in research use. This study found that the second-largest average score was the limited time to implement new ideas and reading research articles. In contrast to previous findings, Mehrdad, Salsali, & Kazemnejad (2008) argued, lack of time was felt to be the fifth barrier most frequently cited in the use of research. Pettengill, Gillies, and Clark (1994) suggested that there is a need to investigate the concept of time in terms of personal factors such as motivation and aspiration. The next barrier was low nurse autonomy in patient care procedures. This is consistent with other findings and may be related to the low status and autonomy of nurses in all countries investigated (Chang et al., 2010; Fink, Thompson, and Bonnes, 2005). Besides, Olade (2003) argued the lack of nurses and authority could generally stem from a tradition where nurses do not question nursing practice but focus on tasks assigned to them by co-workers in management positions or by medical staff.

Conclusion

This article points out that more than half of the respondents have a nursing certificate, the mean of attitude exceeds the average score of knowledge/understanding related to EBP, research terms, and practice towards EBP. The evidence from this study shows that there should be an increase in the

nurse's knowledge and skills in evidence-based practice. Also, analyzing research results and anticipating constraints such as better time management between practice and reading research literature, improving nurse autonomy in patient care practices, and providing referral access facilities. These efforts will undoubtedly enhance the implementation of evidence-based practice.

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Determinant Factors of Depression in Patients with Coronary Heart Disease

Aan Nuraeni, Ristina Mirwanti, Anastasia Anna, Ikeu Nurhidayah
Faculty of Nursing Universitas Padjadjaran, Bandung, Indonesia
Corresponding email:aan.nuraeni@unpad.ac.id

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Abstract

Depression has been related to poor quality of life and recurrence in CHD patients. It is important to explore factors associated with the depression to prevent problems and to assist with appropriate intervention. Furthermore, the determinants of depression in CHD patients in Indonesia are still unknown. This study aimed to identify the determinants of depression in CHD patients in Indonesia. This study was a quantitative study with a cross-sectional approach. Samples were recruited from outpatient care in a referral hospital in Bandung using a consecutive sampling technique for a-2 month period (n=101). Data were collected using a questionnaire package consisting of a demographic questionnaire, Beck Depression Index [BDI] (II), Zung Self-rating Anxiety Scale, Seattle Angina Questionnaire, and Spirituality Index of Well-Being. Data were analyzed using mean, frequency distribution, chi-square and logistic regression analysis. In terms of its association with depression in CHD patients, low spiritual well-being had the highest odds ratio [OR] (OR = 9.3, 95% CI = 2.968 - 29.451, p <0.01); non-anxious state and medication history had low ORs (sequentially OR = 0.2, 95% CI = 0.067 - 0.644, p < 0.01; OR=0.2 95% CI = 0.062 - 0.772, p < 0.01); PCI (percutaneous coronary intervention) with medication had the lowest OR value (OR = 0.02, 95% CI = 0.002 - 0.278, p <0.01). On the other hand, unmarried status and male gender were identified as confounding variables. Low spiritual well-being was a major predictor of depression in CHD patients, whereas no anxiety, and history of medication, consist of CHD medication and reperfusion therapy contributed to a lower risk of depression. It is recommended to include strategies in improving spiritual well being and managing anxiety to reduce the risk of depression among CHD patients.

Keywords: Acute coronary syndrome, coronary heart disease, depression, determinant factors.

Introduction

Coronary Heart Disease (CHD) could induce psychological problems to its patients. One of those problems is depression. Depression which has been experienced by CHD patients can affect the development of CHD disease and quality of life. Depression can affect the cardiovascular directly by increasing the frequency of heart rate and blood pressure. This condition will increase the oxygen demand and decrease the oxygen supply in the myocardium (Glozier et al., 2013). Furthermore, it will increase the risk of angina or recurrence. Depression also contributes to the formation of thrombosis (Huffman, Celano, & Januzzi, 2010; Lichtman et al., 2014; Williams, Rogers, Wang, & Ziegelstein, 2014) resulting in the formation of new blockages in the coronary arteries and generate recurrence. These conditions can further aggravate the patient's psychological and adversely affect the deterioration of the disease. More over a meta analysis study suggested that depression was a risk factor for death in CHD patients(Wu & Kling, 2016).

Depression has a worse effect on reducing the quality of life in CHD patients than other psychosocial problems such as anxiety. Based on a previous study on CHD patients, it was known that patients with depression had a lower quality of life 5.4 times lower than patients who were not depressed, while anxiety in patients with CHD decreased the quality of life of patients as much as 4.7 times (Nuraeni, Mirwanti, Anna, & Prawesti, 2016). The study also found that depression had the greatest impact on the quality of life compared to other factors, so the incidence of depression should be prevented and should be handled better.

Several factors that affected the incidence of depression based on previous research were anxiety, percutaneous coronary intervention (PCI) and spiritual wellbeing (Gu, Zhou, Zhang, & Cui, 2016; Nuraeni & Mirwanti, 2017; O'Neil et al., 2016) marital status, education level, gender, and poor health condition (Altino, Nogueira-Martins, de Barros, & Lopes, 2017). However, the relationship of various factors, such as demographic data, anxiety, spiritual well-being, angina frequency and physical limitations to the incidence of depression, and which factors have the greatest effect on depression in CHD patients in Indonesia remains unclear. In addition, an overview of the proportion of depression events with treatment options in patients with CAD, in previous studies, especially in Indonesia, is also unclear. Differences in cultural background, social norms, demographic conditions, and health services enable different results on depression and related factors.

The severity of complications that may occur in CHD patients due to depression must be considered and anticipated immediately with appropriate intervention. Investigation factors related to the incidence of depression can be used as the information for anticipating depression incidences. This study was held to identify factors related to depression on CHD patients in Indonesia particularly West Java. These factors were anxiety, spiritual well-being, marital status, and several factors related to health conditions, such as physical limitations, and frequency of angina, and factor related to medication history (medication, PCI with medication, and CABG with medication). This study was expected to provide an overview of the factors that contribute to the occurrence of depression in CHD patients so that efforts to prevent the problems can be done more precisely and effectively.

Method

Data used in this analysis was derived from the "Depression and Frequency of Angina Patients with Acute Coronary Syndrome" study. The study used a descriptive quantitative method with a cross-sectional approach (Lismawaty, Nuraeni, & Rapiah, 2015). The population of the study was patients with CHD who had a history of stable angina, unstable angina, ST myocardial infarction elevation, non-ST elevation myocardial infarction. The sample of the study was taken using a consecutive sampling technique from outpatient care in a referral hospital in Bandung with the criteria that the patient had undergone care at least for a month. Data collection was conducted for 2 months from April to June 2015 and

obtained 101 respondents who were qualified and filled the instrument completely.

There were 10 variables measured from the research, with depression as a dependent variable and 9 independent variables (predictors) i.e. age, sex, marital status, income level, anxiety, spiritual well-being, physical limitations, angina frequency, and medical history. Depression in this study was measured using an instrument of Beck Depression Inventory II (BDI-II) Indonesian version had been tested for construct validity by validation value r = 0,55, p <0,01 and reliability measured with alpha equal to 0,90 Cronbach (Ginting, Näring, Van Der Veld, Srisayekti, & Becker, 2013). Depression was categorized into 2 groups i.e. BDI (II) score ≤ 13 included in no depression and BDI II score ≥ 13 as depression. The Spirituality Index of Well-Being (SIWB) is used to measure the level of spiritual well-being. This instrument had been used in Indonesia with validity test result r = 0.373 - 0.614 (r table 0.195) and reliability 0.805 – 0.825 (Nuraeni et al., 2016). Spiritual well-being was categorized by mean score. If the SIWB score of respondents was greater than SIWB mean score of all respondents then it was categorized as having high spiritual well-being. The mean score of SIWB in this study was 49.14. The Zung Self-rating Anxiety Scale (SAS) was used to measure anxiety. It had a validity score of 0.66, which increased to 0.74 in patients diagnosed with an anxiety disorder and had an alpha cronbach of 0.85 (McDowell, 1989). This variable was categorized as not anxious if the score less than 44 and anxious if the score was in the range of 44 – 100. Seattle Angina Questionnaire was used to measure the physical limitations and frequency of angina. The reliability for the dimensions of physical limitations was 0.83, and for the dimension of angina, the frequency was 0.76 (Spertus, et al., 1995). Physical and anginal variability were categorized into mild (50-100) and moderate-severe (0-49) score.

Characteristics of the respondents (age, sex, income level, and marital status), depression, spiritual well-being, anxiety, physical limitations, and frequency of angina presented descriptively. Bivariate analysis was tested using the chi-square test and the variable relation model with depression was analyzed by logistic regression. The questionnaires and data collection process had undergone an ethical review and had obtained ethical clearance from the Health Research Ethics Committee of Hasan Sadikin Hospital, through a recommendation letter of ethical clearance Number: LB.04.01 /A05/ EC/106/IV/2015.

Results

Table 1 Demographic and Depressive Characteristics of Respondents

Characteristics	Frequency (f)	(%)	BDI-II Score -freq (N=101)				Depression Mean(SD)	p-value
			≤13	%	>13	%		
Depression scores								
≤13	60	59.4	60	100	-		12,25(8,3)	-
>13	41	40.6	-		41	100		
Age								
0–60 years old	60	59.4	35	58.3	25	41.6	12,77(7,94)	0.791
>60 years old	41	40.6	25	60.98	16	39.2	11,5(8,97)	
Gender								
Male	78	77.2	49	62.8	29	37.2	15,8(10,3)	0.198
Female	23	22.8	11	47.8	12	52.2	11,2(7,4)	
Marital status :								
Married	91	90.1	56	61.5	35	38.5	7,1(4,9)	0,188
Not-married	10	9.9	4	40	6	60	17(9)	

incomes/month								
1 – 2,9 million Rp	68	67.3	40	58.8	28	41.2	12,8(8,7)	0,864
≥ 3 million Rp.	33	32.7	20	60.6	13	39.4	11,1(7,5)	
anxious :								
anxious (low-severe)	57	56.4	27	47.4	30	52.6	14,15(8,6)	0,005**
Not-anxious	44	43.6	33	75	11	25	10,1(7,6)	
Physical limitations :								
Minimal-low	98	97	58	59.2	40	40.8	12,2(8,4)	0,795
Moderate-severe	3	3	2	66.7	1	33.3	14,0(4,3)	
Spiritual-wellbeing :								
Low	53	52.5	20	37.7	33	62.3	13(8,4)	0,000**
High	48	47.5	40	83.3	8	16.7	5,9(3,8)	
Frequency of angina								
Minimal-low	90	89.1	55	61.1	35	38.9	11,6(7,6)	0,318
Moderate-severe	11	10.9	5	45.5	6	54.5	17,8(11,9)	
Medical treatment history								
Medication	60	59.4	34	56.7	26	43.3	12,67(7,6)	0,005*
PCI and medication	16	15.9	15	93.75	1	6.25	6,12(5,9)	
CABG (with or without PCI) and medication	25	24.8	11	44	14	56	15.2(9.5)	

Table 2 Final Model Factors Associated with Depression in Coronary Heart Disease Patients

Variables	Categories	Depression on CHD Patients		
		p-value	OR	95% CI
Gender	Male	0.247	2.314	0.560 – 5.570
Marital status	Not-married	0.076	6.621	0.820 – 53.483
Spiritual-wellbeing	Low	0.000**	9.349	2.968 – 29.451
Anxious	Not-anxious	0.007**	0.207	0.067 – 0.644
Medication treatment history	CABG and medication	0.006**		
	Medication	0.018*	0.218	0.062 – 0.772
	PCI and medication	0.003**	0.023	0.002 – 0.278

The results showed that there were three variables that had significant differences in depression status; The variables were anxiety, spiritual wellbeing, and type of medication. The proportion of patients with mild to severe anxiety who experienced depression was more than a half (52.6%) while patients who were not anxious accounted for only 25% with depression; and only 16.7% patients with high spiritual well-being who experience depression, this was different from patients who had low spiritual well-being. The incidence of depression was the majority, it was accounted for 62.3%. The results of the analysis are shown in table 1.

Based on an analysis of the factors studied, including age, sex, marital status, income level, anxiety, spiritual well-being, physical limitations, angina frequency, and medical treatment history, that meet the requirements to be included in the multivariate analysis were gender, marital status, anxiety, spiritual-

wellbeing and medical treatment history. These factors then were involved in the investigation to identified the final model.

The final model of logistic regression analysis showed that not anxious and medication treatment history; and PCI with medication as a predictor variable of low risk of depression and low spiritual well-being factor as a predictor of an increased risk of depression while male and unmarried status variables became confounding variables.

Low spiritual well-being had the highest OR which was 9.349 (9.3). It means that CHD patients with low spiritual well-being had 9 times more risk of depression than those with high spiritual well-being with a probability of depression 90.34%. Meanwhile, the non-anxious variable had a low OR of 0.2 meaning that CHD patients who were not anxious had 0.2-time depression risk than an anxious CHD patient with a 16% probability of depression. The same OR as the non-anxious variable occurred in medication history (OR= 0.2). It means that the medication history had a 16% probability of depression compared to patients who had undergone CABG. PCI with medication was the variable with the lowest OR (0.02) means that CHD patients with a history of treatment had a 2% risk of depression compared to those who had undergone CABG treatment history and medication. However, those risks were also affected by gender and marital status as confounding factors. The final model obtained from the analysis is illustrated in Table 2.

Discussion

Based on the results, the factors that had the highest average depression score were in the category of medium to severe angina which was 17.8 (SD = 11.9). Whereas based on the distribution frequency, more than three-fifths (62.3%) of respondents with low spiritual well-being experienced depression, this factor had the highest incidence of depression compared to other factors. The score of 17.8 in BDI-II was included in the range of the mild depression (mild depression range score 14-19). This means that the average depression score of each category lies in mild depression. However, depression in this category might increase to moderate and severe levels, if it is not given appropriate intervention. The results of this study indicated that depression experienced by CHD patients was in the mild category but with a high-frequency occurrence. These results provided an overview of the need for serious effort to prevent an increase in depression levels thus unexpected adverse outcomes can be avoided (Huffman et al., 2010; Kim et al., 2017; Lichtman et al., 2014).

Spirituality can be a source of coping with patients with chronic depression. patients with chronic diseases benefit greatly from practicing their religious practices and beliefs, especially in individuals who were able to maintain hope, realized the meaning of life, and had peace and use it as a source of coping (Lucette, Ironson, Pargament, & Krause, 2016). Spirituality and religiosity capable of reducing depression is a spirituality that is generating or maintaining hope, belief, and peacefulness (Bekelman et al., 2007; Lucette et al., 2016). It could be obtained by individuals who have good spiritual well-being. Other studies conducted on patients with heart failure showed similar results that high spiritual well-being corresponds to a decrease in depression (Bekelman et al., 2007). Furthermore, Warber et al in a study on CHD patients found that spiritual intervention can be used to increase hope and reduces depression (Warber et al., 2011).

Religion is a part of spirituality, religious dogma, as well as religious practice, can help a person understand spirituality (Burkhardt, M. A., & Nagai-Jacobson, 2005). Islam is a religion embraced by almost all respondents in this study. According to the view of Islam, physical pain or suffering must be seen as a temptation given by God, and man are required to endeavor, be patient, pray and hope only to God (Yaacob, 2013). If someone has had this view then they will have peace and serenity. Based on the results of the study, most respondents have low spiritual-wellbeing (52.5%), this suggests that the majority of patients in this study had not been able to live out their religion and gain an understanding of the meaning and purpose of life, hope, and peace (spirituality). The Management of CHD patients following acute phase in

this population mostly focused on physical aspects including cardiac rehabilitation as well as lifestyle arrangements, but the spiritual aspect to improve the spiritual wellbeing had not been done optimally. In fact, the results of research proved that CHD patients in this study required better spiritual intervention in addition to physical aspects.

Anxiety is a psychosocial problem that is often experienced by CHD patients and associated with a poor prognosis of the illness. Anxiety trigger factors are often difficult to avoid, but the most important is the ability to control anxiety, particularly for CHD patients. Information about the risk of anxiety as well as how to reduce or control anxiety becomes important to be delivered to CHD patients so that patients are able to manage anxiety independently after returning home. This ability to control anxiety becomes very essential because anxiety related to the increase of angina frequency (Rachmi, Nur'aeni, & Mirwanti, 2018) and the increase in the frequency of angina affects the functional status of patients, where according to Shin, Hwang, Jeong, and Lee (2013), functional status in CAD patients significantly influences depression. Furthermore, Nuraeni and Mirwanti (, (2017) stated that anxiety is directly related to depression in CAD patients.

The next factor was patients undergoing CABG with medications; and PCI with medication. The results showed that patients undergoing medication and PCI therapy had a lower risk of depression than patients who underwent CABG. CABG is a reperfusion therapy through surgery, to open coronary blockages bypassing arteries that block the supply of blood to the heart using blood vessels from other parts of the body (Stillwell, 2011). CABG is major surgery, contrary with PCI. PCI is not a surgical procedure, the recovery process of PCI might be shorter and lighter compared to CABG.

Prior studies showed that in the beginning phase, PCI has a higher level of recovery than CABG. It was stated that the quality of life of patients undergoing PCI in the first month increased more rapidly than CABG patients and slightly changed in the three months post-therapy (Doering, Rumpold, Oldridge, & Benzer, 2006). Other than that, the mortality rate in CABG was also higher than PCI at one-year post-therapy (Szyguła-Jurkiewicz, B., Wilczek, K., Przybylski, R., Pacholewicz, J., Trzeciak, P., Styn, T., Zembala, M., Poloński, 2004). Furthermore, stroke was more common in patients undergoing CABG than PCI at 12 months post reperfusion therapy. However, there was different finding from a study which stated that CABG was able to lower the risk of major adverse cardiac or cerebrovascular events (MACCE) higher than PCI (Feldman et al., 2009). These conditions explain that the risk of depression in patients with CABG is higher than patients who undergo PCI, although at low risk, in the first year after therapy. It's also implied that nurses or other health workers could anticipate depression in CHD patients by giving more attention on physical, psychological and spiritual needs particularly in patients undergoing CABG therapy in the first year after therapy.

This study also discovered the confounding factors that could influence depression in CHD patients. Those factors were gender and marital status. Both of these factors can make a difference in the risk of depression. Based on the result of logistic regression, it can be predicted that CHD patients with low spiritual wellbeing status may be at greater risk of depression if the patient is male and unmarried, whereas in female and married patients it is likely to have a lower risk of depression.

This study had several weaknesses. This study did not explain the medication used by the patients. Other than that, this study did not state how long the patients were diagnosed and were undergoing treatment with medication therapy or reperfusion therapy, whereas based on the results of previous research it was known that the duration of any treatment can determine the outcome of the respondents and may have an effect on the risk of depression.

Conclusion

Low spiritual well-being was a major predictor of depression in CHD patients. It was also known that not-anxious, as well as medical history with medication or

reperfusion therapy, might determine a lower risk of depression. However, patients with CABG need more attention because they had a higher risk of depression than other therapeutic options even at very low risk of depression. Prevention of the incidence of depression can be done through efforts to improve spiritual wellbeing and anxiety management in CHD patients.

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We guarantee that the manuscript is original, has never been published elsewhere and will not be submitted to another publisher.

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Relationship External Factors with Internet Addiction in Adolescent Age 15–18 Years

Masdum Ibrahim[1], Suryani[2], Aat Sriati[3]
[1]STIKep PPNI, Bandung, Indonesia
[2,3]Faculty of Nursing, Universitas Padjadjaran, Bandung, Indonesia
Corresponding email: masdumibrahim@gmail.com

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Abstract

The internet is one form of evolution in the development of communication and technology that affects humans. One result of the internet is a significant change in the pattern of primary social interactions between individuals. The convenience provided by the internet indirectly causes individuals to have high levels of addiction to the internet and tend to show symptoms of addiction. In Indonesia, internet addiction is mainly found in groups of adolescents aged 15-22 years. This study aims to determine the relationship of external factors: academic stress, family attachments and peers with internet addiction in high school adolescents aged 15-18 years. The study design was carried out using a correlational research design with a cross sectional approach. Respondents who contributed in this study were 97 senior high school students. With sample selection, random sampling is done. The statistical test used was chi-square. The results of this study prove that academic stress has a significant relationship with internet addiction value X2 = 7.91 and P = 0.019 <0.05. Family attachments did not have a relationship with internet addiction, the value of X2 = 0.046 and P 1,000> 0.05 and peers did not have a relationship with internet addiction X2 = 0.241 and P = 0.657. Based on the results of this study, it can be said that the school through the school committee to share information or share about the problem of teenagers who experience academic stress, internet addiction, impact and how to overcome them also evaluate the learning process.

Keywords: Academic stress, adolescent, family attachment, internet addiction, peer attachment.

Introduction

The internet is one form of evolution in the development of communication and technology that affects humanity. One result of the internet is a significant change in the pattern of primary social interaction between individuals. Conventional conversations such as face to face have been replaced by internet messages, video calls and social media. This can happen because the weaknesses of conventional communication such as distance and time can be covered by the internet (Young & de Abreu, 2011).

The convenience provided by the internet indirectly causes individuals to have high levels of addiction to the internet and tend to show symptoms of addiction or addictions (Young & de Abreu, 2011). There are various terminologies used by some experts to identify internet addiction as mentioned in such as: internet addiction compulsive internet use phatological internet use, problematic internet use. But almost all agree that the core of the problem of internet addiction is the disruption of the personal lives of individuals and increased tolerance to the internet, namely increasing duration of internet to satisfy self-satisfaction (Young, 1999).

Internet usage has increased in various countries every year. Data World Stats in 2017 found the highest number of internet usage in China with internet users 738,539,792 from a population of 1,388,232,693, around 53.2%, India 34.4% and the United States 87.9%. In Indonesia internet users in 2017 reached 132,700,000 or 50.4% of Indonesia's total population of 263,510,146 becoming internet users who ranked 5th after China, India, the United States and Brazil. In the United States the prevalence of internet addiction in adolescents aged 14-18 years reached 4% (Liu et al., 2007) while in Asian countries such as China reached.

Indications of internet addiction have occurred in Indonesia, mainly found in adolescents. The survey conducted by Internet World Stats (2017) shows that internet users in Indonesia are dominated by ages 15-22, ranging from 42.4%, and 84.7% using the internet via smartphones. Nearly 70% of teen internet users spend more than 3 hours a day using the internet. The three main things that netizens do (internet users) are accessing social media (94%), searching for info (64%), and opening e-mail (60.2%). Adolescents are a group that occupies a sizeable population reaching around 18% or 1.2 billion of the world's population (WHO, 2015).

The projection in Indonesia of adolescents aged 10-24 years reaches 25% of the 256 million population and in Bandung Regency the number of adolescents reaches around 25% of the total population of 3,596,623 people (BPS, 2015). With the large population of adolescents it is expected to be the next generation that has optimal quality performance according to their growth and development. Adolescents experience periods of growth and development. Individuals experience changes from childhood to adulthood followed by biological, psychological and social changes (Santrock, 2005). Kim (2008), adolescents who are often said to be at risk groups start from the age of 12-18 years, and the age most at risk is age 16, at this age adolescents enter the age of high school (SMA).

Research conducted by Xu et al. (2012) found that high school adolescents did not have good self-control, poor self regulation and low cognition compared to adolescents who had taken lectures. This is supported by Kuss's research (2013) which found high school adolescents had the desire to be free like adults. The results of the search for some literature show that internet addiction in adolescents can be influenced by two factors, namely internal factors and external factors. Internal factors include loneliness low self-esteem and neuroticism personality (Karimpoor et al., 2013).

External factors include adolescents who have families who have problems in family function (Tsitsika et al., 2011; Park et al., 2013), study load and peer influence (Wang at al., 2011). The existence of problems in the development of adolescents can cause mental health problems if not resolved properly. Various adolescent mental health problems are such as learning difficulties, juvenile delinquency and sexual behavior problems (Davdson, 2006).

Therefore, mental health nurses have an

important task in helping these problems. Activities that can be done by nurses in providing services and guidance in schools are primary prevention by conducting social programs that aim to create an environment to improve adolescent health. Nurses can also do secondary prevention such as resolving cases found in adolescents. In addition to primary and secondary prevention, nurses can provide therapeutic support for children and adolescents through psychotherapy, counseling, family therapy and counseling in the school and family environment (Kusumawati, 2010).

Baleendah District is one of the Districts in Bandung Regency which has a population of 251,996 people with a school age of 7–12 years with 4,157 people, 13–15 years old school age 4,663 people, school age 16–18 years 4,663 people (BPS, 2015). The existence of school age in Baleendah District is a potential for the future of the younger generation to progress in Baleendah sub-district. The Dikdasmen data of the Ministry of Education and Culture (2018) mentions Baleendah District as a sub-district that has a high school distribution of 8 high schools with 3,682 students.

A preliminary study conducted on 10 high school students domiciled in Baleendah Subdistrict found 4 students using the internet since elementary school (SD), 4 students using the internet since junior high school (SMP) and 2 students using the internet since high school (SMA) . Four students say they use the internet more than 5 hours per day and four students use the internet less than 5 hours per day. All students interviewed said they often visited the Google site for school assignment searches, then accessed youtube, online games, and social media such as Instagram, Facebook, line, Whats App and vlog.

All students interviewed said using whatsapp and line for communication facilities. Six students said they felt anxious, depressed, lonely, uncomfortable, afraid to lose the latest information, if they did not use the internet they would try to be able to access the internet immediately by filling out internet quota, searching for internet cafes and free wi-fi. Furthermore, two students said it was normal to not use the internet. The results of the interview also found that all students had smartphones and four students were facilitated by internet services installed in their homes so that students actively played online games. Three students also said that they had never attended school because they played online games at the internet cafe.

The results of surveys and observations carried out in several high schools in Baleendah Subdistrict, there are five schools that allow students to bring smartphones and some even have wi-fi facilities in their school. Activities at recess in the canteen or in the park are seen by some students using laptops to use Wi-Fi facilities in schools, some students are using their smartphones to open their social media, such as: Facebook, line, Instagram and Whats App.

Method

Design research by cross sectional aproach, uses a correlation analysis research design that aims to determine the relationship between independent variables and the dependent variable conducted in September - October 2018 This research permit No : 070/1092-CADISDIKWIL VIII from Educator Authorietis West Java Province. The research with population of 3682 students from 8 high schools in Baleendah District, Bandung Regency . Using random sampling with Taro Yamane or Slovin formula and sample results of 97 students with inclusion criteria such as: high school students who have ages 15-18 years, students who experience internet addiction are based on the results mild dependence internet addiction with screening using an Internet Addiction Test. The research using Educational Stress Scale for Adolescents (ESSA), Inventory Parents and Peer (IPPA) and Internet Addiction Test (IAT)

Results

A. Characteristic of respondents

Based on table 4 above, it can be seen the sociodemographic description of the respondents most (80.4%) of respondents live with their parents. Nearly half (42.3%) of

respondents use the internet to communicate. If seen by the duration of internet usage more than half (64.9%) of respondents use the internet more than the same as 6 hours per day.

Based on table 4.3 above, it can be seen

Table 1 Distribution of Frequency Characteristics of Adolescents 8 Senior High Schools in Kecamatan Baleendah Kabupaten Bandung (n = 97)

Characteristics	Frequency	Percentage (%)
Gender		
Male	46	47.4
Female	51	52.6
Total	97	100

Table 2 Distribution of Sociodemographic Frequency of Adolescent High School in Baleendah District of Bandung Regency (n = 97)

Sociodemography	Frequency	Percentage (%)
Living Together		
Both parent	78	80.4
One of the parent	10	10.3
Guardian	9	9.3
The main purpose of using the internet		
Social Network	27	27.8
Game Online	13	13.4
Finding Information	16	16.5
Communication	41	42.3
Duration of internet usage in a day		
≥ 6 hours /day	63	64.9
< 6 hours/day	34	35.1

Table 3 Frequency Distribution of Academic Stress, Family Attachment and Peers and Internet Addiction (n = 97)

Academic Stress	Frequency	Percentage (%)
Low	16	16.5
Medium	80	82.5
Height	1	1.0
Parent Attachment	Frequency	Percentage (%)
Medium	45	46.4
Height	52	53.6
Peer Attachment	Frequency	Percentage (%)
Medium	50	51.5
Height	47	48.5
Internet Addiction	Frequency	Percentage (%)
Mild dependence	27	27.8
Modetare dependence	70	72.2

a description of academic stress, family attachments and peers. In the academic stress variable, most (82.5%) respondents experienced academic stress in the moderate category. At family attachments more than half (72.2%) of respondents included in the medium category. Meanwhile, internet dependence, that more than half (72.2%) of respondents experience moderate dependency.

B. Distribution Mean, Standar Deviasi, Nilai Minimum - Maksimum

Based on table 4.5, the statistical test with chi-square showed that there was a significant relationship between academic stress and internet addiction with a value of P = 0.019 <0.05. Attachments of families with internet addiction with a value of P = 1.000> 0.05) which showed no significant relationship between family attachments and

Table 4 Distribution Mean, Standar Deviasi, Nilai Minimum - Maksimum

Variabel	Mean±SD	Minimum-Maximum
Akademic Stress	90.34±11.16	62–112
Parent Attachment	90.58±9.98	62–114
Peer Attachment	43.99±6.25	29–61
Internet Addiction	54.58±11.02	21–73

Table 5 Correlation Between Academic Stress, Family Attachment and Peer Friends with Internet Addiction In Adolescents High School in Baleendah District, Bandung Regency.

Variabel	Chi-Square (X^2) P-Value
Akademic stress	X^2 = 7.951
	P= .019**
Parent Attachment	X^2 = .046
	P= 1.000
Peer Attachment	X^2 = .241
	P= .657

internet addiction. Whereas peer attachment with internet addiction with P value = 0.657> 0.05 indicates that there is no significant relationship between peer attachments.

1. Overview of Academic Stress

In the academic stress variable, the majority (82.5%) of respondents experienced academic stress in the medium category, the results of this study found that academic stress was the main source of stressors for students. Teenagers easily experience stress because adolescents experience a period of transition from children to adults which is characterized by the existence of biological, psychological and social changes (Santrock, 2005) Stroud et al., (2009) stated that adolescents who are easily stressed are adolescents ranging in age from 14-19 years, where at that age adolescents entering junior high school (SMP) and senior high school (SMA) are in harmony with respondents who are subjects of research.

The results of this study show that academic stress has the highest score on question number 6 "I feel depressed when studying" with a score of 338. The results of the study are in line with Schafer's research (Rafidah et al., 2009) which found that the things that caused students to feel stressed were stressors stemming from academic problems such as stress in learning, very short time, making papers, examinations, and instructors who boring. Pressure and obstacles on students.

2. Overview Parent Attachment

At family attachments, most (53.6%) respondents are included in the high category. The results of this study indicate that family attachments in adolescents aged 15-18 years in Baleendah District High School are very

good. This is in line with the characteristics of adolescents in this study where 80.4% lived with both parents. Family is the main place for adolescents in the process of forming social skills and emotional development, especially the condition of adolescents who are entering a transition period so that they get the foundation in shaping their ability to face the next life so they can be successful people in society.

Armsden & Greenberg (2009) in his research suggesting parental attachment is a significant predictor of adolescent self-esteem. This is supported by Wilkinson's (2004) study which found high school adolescents who had good attachment to their parents would contribute to their psychological well-being. Furthermore, the Ahkter study (2014) found a difference in adherence to adolescent boys and girls. In general, female adolescents are considered to have a higher attachment than adolescent boys, this is because young women have more time at home than adolescent boys. This study also found a difference in attachment between fathers and mothers in terms of care, fathers are considered more authoritarian in terms of care and mothers are considered more sensitive and care about the needs of adolescents. The results of this study are supported by the study of Deng et al (2013) who found that the high alienation of mothers and children has a very important role in predicting problem behavior in adolescents.

Triyanto (2014) The research objective was to identify the influence of family support for adaptive behavior of adolescent puberty. Quasi-experimental design approach without pre-posttest control group design was applied. Respondents was selected by purposive sampling in Baturaden. Adaptive behavior that increased from 60% to 97% after optimization family support. Difficulties of parents in providing family support when directed to learn, to establish open communication, and teenagers emotional. There is the influence of family support optimization significantly to the increase of adaptive behavior adolescentswith p value of 0.001.

3. Overview Peer attachment

The results of this study indicate more than half (51.5%) of respondents have peer attachments that have a moderate category. This means that peers have an important role in the lives of adolescents. Attachment changes occur when teens learn and develop relationships with individuals other than family. Peer attachment is a bond that occurs between adolescents and peers who relate to thoughts, feelings and emotions (Baroccas, 2009).

Wilkinson's (2004) study found adolescence's attachment to peers was interwoven because of the personal experiences of adolescents from interactions with their parents. Safe attachment with parents is the initial source that determines how teens will evaluate themselves and interact with others. It is believed that the quality of adolescent relationships with parents has a good impact on the self-concept of adolescents in establishing harmonious relationships with their peers.

4. Overview Internet Addiction Levels

Based on data on internet dependence (72.2%) respondents experienced moderate dependence and (27.8%) respondents experienced mild dependence. In the era of globalization, technological advances have a major influence on society, especially adolescents. Teenagers can easily access the internet wherever and whenever. This is supported by increasingly sophisticated facilities such as smartphones with several advanced features in them and supported by more and more spots found that provide free wifi.

Greenfield, (1999) in Young and Abreu (2011) explains that the internet is so attractive, because it contains colors, movements, sounds, interactivity and infinite information that causes a person to feel comfortable and unaware of a problem. In adolescents the internet is more used for entertainment facilities than task search so that it can increase internet dependence (Floros & Siomos, 2013). Hardanti (2013) factors underlying the behavior of playing online games at school age The results showed that 56% and 60% addiction behavior influenced by motivational factor and attraction factors. Based on this finding, it is recommended to treated and prevent games addiction behavior

in children based on collaboration between family, school and health provide.

The dependence of the internet on adolescents aged 15–18 years in SMA Kecamatan Baleendah Bandung Regency is also influenced by several aspects, one of which is the availability or coverage of the internet either through smartphones or wi-fi installed in the school environment. The availability of the internet is not only in urban areas, inversely proportional to the research conducted by Mohsin, Mishra & Sahu (2016) who found that urban teenagers use the internet more because of affordability of access and they have more knowledge about technological developments especially the internet. Urban teenagers are more consumptive in terms of internet usage compared to teenagers in rural areas.

The results showed that the majority of high school adolescent respondents in Baleendah District, Bandung Regency (42.3%) used the internet for communication media. If seen by the duration of internet usage more than half (64.9%) of respondents use the internet more than the same as 6 hours per day. In line with the research of Block (2008) and Wu, Lee, Liao, and Chang (2015), Beard (2005) states that some diagnostic criteria needed to enforce someone experiencing internet addiction include being busy with internet activities, increasing the amount of time needed to access the internet , fails to control internet usage, is nervous, depressed, depressed or irritable when trying to reduce or stop using the internet. In addition to the criteria above Tao et al. (2010) stated that a person is said to experience internet addiction if using the internet for 6 hours or more per day and this has been going on for at least 3 months. Another opinion states that someone is said to experience internet addiction if using an average of 38 hours or more per week (Young in Koc, 2011).

5. Relationship between Academic Stress and Internet Addiction

Based on table 5, the statistical test with chi-square showed that there was a significant relationship between academic stress and internet addiction with a P value = 0.019 <(0.05). In line with Putri's research (2017) the results of the Rank Spearman test with a value of p 0.000 (<0.05) showed that there was a positive relationship between academic stress and internet addiction and the value of r = 0.525 showed a moderate strength of meaningful relationships, the higher academic stress the higher the teenager is at risk of experiencing internet addiction.

Similarly, the Jun & Choi Research (2015) examined the relationship of academic stress mediated by negative emotions and its relationship to internet addiction. The results of this study indicate that adolescents who experience academic stress may be at risk of internet addiction especially when accompanied by negative emotions. Academic stress can be felt with various school assignments, the number of quizzes, and exams, which is in line with Lal (2014) study that found academic stress can arise due to adolescents having to face many academic demands, such as school exams, answering questions in class, showing progress on subjects, understanding what taught by teachers, competing with classmates, and fulfilling the expectations of teachers and parents of students.

Prolonged academic stress can also result in losing interest, decreasing concentration and avoiding problems that can cause students to look for other activities to reduce academic stress such as accessing the internet (Jun & Choi, 2015). According to Wang, Zhou, and Lu (2011), the risk factors for adolescents experiencing internet addiction are related to stress, resulting in bad relationships with teachers and friends and experiencing conflict within the family.

Academic stress that occurs in high school adolescents aged 15–18 years in Baleendah Subdistrict due to pressure while studying with a value of 388 is highest among other statements. This shows various factors, one of which is because the learning process and method are in accordance with Schafer (Rafidah et al., 2009) who found several things that can cause students to feel stressed are stressors that originate from academic problems such as stress in learning, very short time, boring papers, examinations, and teachers.

6. Relationship Between Parent Attachment with Internet Addiction

The results showed that there was no relationship between family attachments and internet addiction with a value of P = 1.000> (0.05). This finding is different from the results of a previous study conducted by Putri (2017) in SMA in Andir Sub-District, Bandung, where there was a relationship between family attachments and internet addiction with a value of p = 0.000 (< 0.05). The difference in the results of this study with Putri's research (2017) is likely caused by several factors, including:

1) differences in the place of study, Putri (2017) conducted a study in Bandung City, a researcher in Baleendah District, Bandung Regency.The condition in urban areas as we know is found by many parents who are busy with their work, so that supervision on their internet use for their children is neglected. In line with research conducted by Weistein & Lejoyeux (2010) which found a lack of supervision from parents is a factor that can cause teenagers to experience internet addiction.

2) at Baleendah concern for parents of their children in the high category. Parents always devote love and attention to children will make them obey the rules and responsible for their duties. Nevertheless the level of internet dependence on adolescents aged 15–18 years in SMA Baleendah District is in the moderate category.

This can occur because of a lack of parental knowledge about how to use the internet and how to effect internet usage. So that children are left to use the internet at will. The results of research conducted by Chalim (2018) the role of parents in the digital era are required to be able to supervise and control their children in using the internet. Controlling internet usage does not have to be done tightly, it can be done in a persuasive way that is respecting children's privacy.

Parents in the digital age are expected to be able to understand the use of the internet and the applications contained in it.

3) other factors that make it possible to cause a moderate level of internet dependence is the availability of wifi in schools that can be accessed and students are allowed to bring smartphones. The ease of using the internet can be facilitated by the presence of wi-fi installed in schools. Certain areas will be met by students such as: parks, canteens and libraries that have Wi-Fi installed.

When interviewing some respondents from 8 high schools in Baleendah Subdistrict, only one high school had rules for students to be prohibited from using the internet and smartphones while in the school environment. Seven other high schools do not have such rules and Wi-Fi has been installed which can be accessed freely by their students.

7.Relationship Peer Attachment with Internet Addiction

The results showed that there was no relationship between peer attachment and internet addiction with a P value of 0.657> (0.05) indicating that there was no significant relationship between peer attachments. This finding is different from the Putri (2017) study which found a link between peer attachment and internet addiction. The results of this study are also different from the results of other studies conducted by Muna (2016), there is a significant influence between peer interactions with the intensity of internet use in class XI Yogyakarta 2 nd Vocational High School. Lin, Ko, and Wu (2011) and Morsünbül (2014) suggest teenagers who do not have safe attachments or more alienation with peers such as disdain, are positively related to their internet addiction.

This difference is likely caused by the purpose of internet use in adolescents in this study, namely communication and social networking. The results of previous studies conducted by Putri (2017) found the purpose of teenage internet use in SMA Andir District, Bandung City for online games and information seeking. In line with the results of the study of Pawlowska, Zygo, Potembska, Kapka-skrzypczak, & Dreher, (2015) which compares the level of adolescent dependence on the internet in urban and rural areas. The results of their study found that there were significant differences between internet use of urban and rural teens. Rural teenagers generally only use the internet for information seeking purposes such as school assignments while social interaction is still very good with peers in real life. Whereas urban teenagers are more comfortable in using the internet not only to seek information but for various purposes including entertainment such as

online games, pornography and social media activities.

The strength of this study compared to previous research, is that researchers in data collection use affordable populations by screening which has a minimum criteria for mild dependency. With the number of samples 97 obtained by random sampling

8. Limitation of Research

This research has been carried out by the scientific method. But in its implementation there are still limitations to research such as: there are still respondents who ask when filling out the questionnaire. This happened because respondents did not focus when explaining or not understanding the questions in the questionnaire.

Conclusion

The results of this study prove that between academic stress, family attachment and peers with internet addiction, and from these three factors only academic stress has a significant relationship with internet addiction in high school students aged 15–18 years in Baleendah District, Bandung Regency.

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The Different of Finger Handheld and Deep Breathing Relaxation Techniques Effect on Reducing Heart Rate and Stress Levels in Primary Hypertension Patients

Arif Setyo Upoyo, Agis Taufik
Faculty of Health Sciences, Universitas Jenderal Soedirman, Purwokerto, Indonesia
Corresponding email: afkarfadholi@gmail.com

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Abstract

Stress and hypertension have a reciprocal relationship where hypertension can increase stress, and stress will also increase blood pressure. Therefore we need an effort to control stress in patients with hypertension to prevent increasing blood pressure that can cause complications such as congestive heart failure, myocardial infarction, and stroke. The study aimed to determine the difference between finger handheld and deep breathing relaxation techniques to decrease heart rate and stress levels of primary hypertension patients. The research design used a quasi-experimental design. The research was conducted in Kembaran and East Purwokerto District, Banyumas, Indonesia. There were 50 respondents (25 finger handheld relaxation group and 25 respondents in deep breathing relaxation group). Heart rate and stress levels were measured before and after treatment using heart rate (HR) recordings on digital tensimeter and Subjective Units of Distress Scale (SUDS). Data analyzed using a paired t-test and independent t-test. The results showed there were significant differences in HR and stress levels before and after finger handheld relaxation ($p = 0.000$). There were significant differences in HR ($p = 0.010$) and significant levels of stress ($p = 0.000$) before and after deep breathing relaxation. There was a significant difference in HR ($p = 0.02$) but there was no significant difference in stress levels ($p = 0.23$) after treatment (post-test) between those who received finger handheld and deep breathing relaxation techniques. Conclusion: finger handheld and deep breathing relaxation techniques are equally effective in reducing stress levels in primary hypertension patients. Finger handheld relaxation technique is more effective in reducing HR than a deep breathing relaxation technique.

Keywords: Finger handheld, heart rate, hypertension, relaxation, stress.

Introduction

Hypertension becomes one major health problem in the World. The World Health Organization (WHO) and The International Society of Hypertension (ISH) recorded the number of people suffering from hypertension who have already reached 600 million people throughout the world and 3 million people suffering from hypertension die each year. Hypertension is classified into a non-contagious disease with its highest number of 57.87% in Central Java in 2015 (Dinas Kesehatan Provinsi Jawa Tengah, 2016). Meanwhile, Banyumas Regency ranks fourth with 39.52%. Based on data obtained from the Health Office of Banyumas Regency, patients with hypertension annually increase. In 2016, there were 81,862 people with hypertension at the age of ≥ 18 years old. Kembaran and East Purwokerto are two districts with those suffering from hypertension (Dinas Kesehatan Kabupaten Banyumas, 2016).

Hypertension may be influenced by several factors, such as age, sex, genetic, smoking habits, obesity, stress, exercising habits, coffee consumption, high sodium diet and alcohol consumption (Andria, 2013; Wahyuningsih & Astuti, 2013; Rahmawati & Daniyati, 2016). The research conducted by Mucci et al. (2016) stated that psychological stress significantly influences the systolic blood pressure. An individual with a high-stress level has a 21% higher risk to experience high blood pressure than those with lower stress level (Gasperin et al., 2009). If the stress increases, the hypertension risk will also increase (Liu et al., 2017). Uncontrolled hypertension causes complex problems experienced by patients as a complication of hypertension. The patient's ability to perform self-care agency, psychological stress control is very important and recommended for controlling hypertension (Dendy et al., 2018). Chronic stress and mal-adaptive ability to respond to stress may strongly influence the blood pressure increase (Sparrenberger et al., 2009). When experiencing stress, the arteries which supply the organ functions will be narrower than the blood pressure may increase (Yulianto et al., 2017). Stress condition will cause artery constriction that results in increasing perifer resistance. This condition results in hypertension (Fuchs et al., 2009).

The research conducted by Erris and Rahman (2016) shows that people suffering from hypertension will experience stress because when facing problems, they are unable to control their emotions and anger. They also do not have an awareness to find information to deal with their stress. In addition, the respondents are also less active to do self-relaxation to reduce their own stress. Psychological or mental stress was associated with an increased risk for hypertension (Hu et al., 2015; Jadhav et al., 2014).

Stress stimulates the sympathetic nervous system to increase the cardiac output and arteriolar vasoconstriction, which eventually increases the blood pressure. Stress also stimulates the adrenal gland to release adrenal hormones and stimulate the heart to beat faster and stronger than the blood pressure may increase (Haryono et al., 2016). Thus, an effort to control stress in patients suffering from hypertension is greatly required to prevent the increasing blood pressure which may cause complications, such as congestive heart failure, myocardial infarction, and stroke (Rainforth et al., 2007).

One technique to reduce stress is relaxation. This technique can deliberately overcome and repair patients to deliberately make their body muscles (Sulistyarini, 2013). Effective relaxation therapy for reducing depression, coping, and stress (Kashani et al., 2012). Relaxation therapies that can be used to reduce pain and recovery are Finger Held and deep breathing (Yulastuti, 2015; Sari, 2016; Mason et al, 2013). Relaxation of finger holding is part of Jin Shin Jyutsu (Japanese acupressure)) which is very easy and easy to do for anyone related to fingers and energy flow in our body (Pinandita et al., 2012; Idris & Astarani, 2017). This technique uses simple hand touches that involve breathing to balance the energy in our body to control our emotions to be relaxed (Sari, 2016; Idris & Astarani, 2017). This relaxed feeling can eliminate muscles and reduce difficulties (Yuliastuti, 2015). Deep breathing relaxation can increase oxygen saturated and relax condition (Mason et al, 2013). The results of research conducted by Rosliana et al. (2018) provide five-finger relaxation

therapy that improves sleep quality in breast cancer patients.

This research aims at examining the difference between finger-holding and deep breathing relaxation techniques on reducing the heart rate and stress levels in patients suffering from hypertension.

Method

This quasi-experimental research compares two treatment groups (finger held and deep breathing relaxation) as an independent variable with heart rate and stress level as dependent variables among primary hypertension patients. This research was conducted in Kembaran and East Purwokerto district which has a high prevalence of patients suffering from high hypertension in Banyumas. The population in this study were all hypertension patients in the PUSKESMAS Kembaran Timur Purwokerto in the last 3 months.The sampling technique was a Purposive sampling approach. The inclusion criteria in this research are patients suffering from primary hypertension with the blood pressure of ≥ 140/90 mmHg and willing to become the research respondents. Meanwhile, the exclusion criteria in this research are patients who do not participate in the therapy, with hearing problems, and experience complications with the other diseases (kidney disease, heart disease, diabetes mellitus, and stroke). The obtained research samples are 50 patients, from the results of calculations of the average hypothesis test of two populations. consisting of 25 patients receiving finger-holding relaxation techniques and 25 patients receiving deep-breathing relaxation techniques that guided by the researcher for 15–20 minutes.

The demographic questionnaire was used to identify the respondents' characteristics including age, sex, and blood pressure. The Subjective Units of Distress Scale (SUDS) was employed to measure the stress level. The inconvenience feeling measured with SUDS greatly depends on the current situation that it is quite sensitive to measure the occurring stress level changes (Astri, 2012). SUDS consists of 11 multilevel answer points of Likert scales, starting from 0 points, in which there is no stress at all or relax up to 10 points (the highest stress level). To measure the heart rate (HR), a record on the Medel digital tension-meter licensed by the European hypertension association with technically identical to KD-5915.

The research data were analyzed using univariate and bivariate analysis. Univariate analysis is conducted on each research variable to explain the characteristics of age, sex, systolic blood pressure and diastolic blood pressure then presented in the form of distribution, frequency and percentage.

Data analyzed using a paired t-test and independent t-test. Bivariate analysis is conducted to determine the heart rate and stress level differences in the control and intervention group before and after treated with finger-holding and deep-breathing relaxation techniques. Data analyzed using a paired t-test and independent t-test within spss 16. The degree of significance is determined by the if value of sig $p \leq 0.05$ then the hypothesis of the study is accepted.

This research is conducted after obtaining the approval from the board of health research ethics, Faculty of Medicine, Sebelas Maret University, Surakarta (No. 221/II/HREC/2018).

Results

Respondents' Characteristics

The respondents' characteristics in this research are shown in Table 1 and 2. The respondents are mostly female at the age of more than 60 years old. The respondents' characteristics illustrated in table 2 show that most respondents have the blood pressure of > 160 mmHg. Based on the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC), those respondents are classified into hypertension stage 2. There is no systolic and diastolic blood pressure significant difference in the group treated with a finger-holding relaxation technique and the group treated with and deep-breathing relaxation technique that eventually reduces the blood pressure influence on the heart rate and anxiety level measurement result.

Table 1 Respondents' Characteristics Based on Age and Sex

Characteristics	Finger-holding group (n=25)		Deep-breathing group (n=25)		p
	f	%	f	%	
Age (Year)					
45–59 (middle age)	5	10	0	0	0.013
60–74 (elderly)	20	40	24	48	
75–90 (old)	0	0	1	2	
Mean (SD)	61.80	(6.61)	68.84	(4.85)	
Sex					
Male	6	12	2	4	0.247
Female	19	38	23	46	

Table 2 Respondents' Characteristics Based on Systole dan Diastole Blood Pressure

Characteristics of Blood Pressure	Finger-holding group (n=25)		Deep-breathing group (n=25)		p
	Mean	SD	Mean	SD	
Sistole	164.08	12.93	168.28	21.94	0.415
Diastole	101.64	9.37	98.52	14.94	0.381

After the age of 60 years old (elderly), the prevalence of hypertension increases due to the vascular changes resulted from the plaque accumulation at the vascular endothelium which may increase the peripheral resistance and resulted is in blood pressure increase. Age factor greatly influences the presence of hypertension. The increasing age also increase the risk of experiencing hypertension due to physiological changes resulted from the body degenerative processes.

The hypertension experienced by the women is higher than that experienced by men after reaching the age of 60 years old as women experience menopause (Smeltzer & Bare, 2008). After menopause, the women usually experience hormonal changes which may increase the fat accumulation in vascular endothelium that the hypertension risk continuously increases. Based on the statistical data, there is a significant relationship between mental stress and hypertension in men (Jadhav et al., 2014).

The respondents' characteristics illustrated in table 2 show that most respondents have the blood pressure of > 160 mmHg. Based on the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC), those respondents are classified into hypertension stage 2. There is no systolic and diastolic blood pressure significant difference in the group treated with finger-holding relaxation technique and the group treated with and deep-breathing relaxation technique that eventually reduces the blood pressure influence on the heart rate and anxiety level measurement result.

The Heart Rate and stress level difference before and after the intervention.

The result of the analysis shows that there is significant heart rate and stress level difference before and after the intervention. After the intervention, both groups show the decreasing heart rate and stress level (see Table 3).

Table 3 The Heart Rate and Stress Level of Patients Suffering from Primary Hypertension Before and After Treatment

Relaxation Group	Before		After		p
	Mean	SD	Mean	SD	
Finger-holding					

Heart Rate	84.80	9.40	80.40	9.08	0.000
Stress level	4.16	2.34	3.12	2.11	0.000
Deep-breathing					
Heart Rate	90.16	12.09	87.84	12.53	0.010
Stress level	4.96	2.49	3.84	2.29	0.000

Table 4 The Pre and The Post-Test Difference Between The Patients' Heart Rate Treated with Finger-Holding and Those with Deep-Breathing Intervention

Variable	Finger-holding		Deep-breathing		p
	Mean	SD	Mean	SD	
Heart Rate					
Pre Test	84.80	9.40	90.16	12.09	0.09
Post-test	80.40	9.08	87.84	12.52	0.02
Decrease	4.40	3.90	2.32	4.15	0.07
Stress level					
Pre Test	4.16	2.34	4.96	2.49	0.28
Post-test	3.12	2.11	3.84	2.29	0.23
Decrease	1.04	1.02	1.12	0.78	0.08

The stress level measurement in both groups with SUDS shows that the average stress level is categorized into moderate before treatment but changed into mild after the treatment. It shows that there is a significant stress level decrease experienced by both groups.

The heart rate measurements before treatment in both groups show that there is no significant difference, yet after the measurement, there is a heart rate significant difference (see table 4). The average decreasing heart rate in the group treated with finger-holding relaxation intervention is better than that treated with deep-breathing relaxation intervention, in which the heart rate decrease in the group treated with finger-holding relaxation intervention is 4.4 times/minute, while that in the group treated with deep-breathing relaxation intervention is 2.32 times/minute.

The result of the analysis on stress level shows that there is no significant difference in both groups' pretest and posttest result. However, the average stress level decrease experienced by the group treated with deep-breathing relaxation intervention is better than the group treated with finger-holding relaxation intervention. The stress level experienced by the group treated with finger-holding relaxation intervention decreases by 1.04, while the group treated with deep-breathing relaxation intervention decreases by 1.12.

The result of analysis on stress level shows that there is no significant difference in both groups' pretest and posttest result. However, the average stress level decrease experienced by the group treated with deep-breathing relaxation intervention is better than the group treated with finger-holding relaxation intervention. The stress level experienced by the group treated with finger-holding relaxation intervention decreases by 1.04, while the group treated with deep-breathing relaxation intervention decreases by 1.12.

Both interventions are effective to reduce the stress level. Finger-holding relaxation intervention may relieve the stressful feelings, reduce tension, increase comfort, and help deal with the uncontrolled situations due to the stress without changing the underlying stress causes (National Center on Domestic Violence, Trauma & Mental Health, 2014). Meanwhile, deep-breathing relaxation may effectively induce the development of mood and control the stress (Perciavalle et al., 2017).

The decreasing stress level and heart rate positive influence the patients suffering from

hypertension (Rodrigues et al., 2018). The combination of the increased mental and physical stress may significantly increase the systolic blood pressure (Trapp et al., 2014), while the decreasing stress level may increase the telomerase gene expression and reduce the blood pressure (Duraimani et al., 2015).

Discussion

The heart rate decrease experienced by both groups is due to the finger-holding and deep-breathing intervention to result in the relaxation response. The relaxation response may influence the limbic system in synchronizing the brain waves to the wave α to create a relaxing feeling responded by hypothalamus by reducing the secretion of Corticotropin-Releasing Hormone (CRH), which may also stimulate the anterior pituitary gland to reduce the secretion of Adrenocorticotropic Hormone (ACTH) (Rosaline et al., 2017). The sympathetic stimulation decrease may reduce the heart rate frequency (weinschenk et al., 2016). The result of this research is in line with that conducted by Perciavalle et al. (2017) stating that the relaxation techniques may improve mood and reduce the heart rate and cortisol salivary level.

Both interventions are effective to reduce the stress level. Finger-holding relaxation intervention may relieve the stressful feelings, reduce tension, increase comfort, and help deal with the uncontrolled situations due to the stress without changing the underlying stress causes (National Center on Domestic Violence, Trauma & Mental Health, 2014). Meanwhile, deep-breathing relaxation may effectively induce the development of mood and control the stress (Perciavalle et al., 2017). Pursed lips breathing (PLB) is a breathing technique that can be used to help breathe more effectively and can increase oxygen saturation (Suryantoro et al., 2017). Pursed lips breathing trains Chronic obstructive pulmonary disease sufferers to exhale slower, so that they will breathe easier and feel comfortable, both when resting (Eko et al., 2017).

The finger-holding relaxation technique is more effective to reduce the heart rate because this technique combines the finger-holding and deep-breathing technique to control emotion and stress (National Center on Domestic Violence, Trauma & Mental Health, 2014). The controlled stress may result in the decreasing cortisol hormone and sympathetic response that eventually reduce the heart rate. Deep-breathing may activate the baroreceptors which stimulate the parasympathetic nerves to reduce the heart rate (Mason et al., 2013).

The decreasing stress level and heart rate positive influence the patients suffering from hypertension. The combination of the increased mental and physical stress may significantly increase the systolic blood pressure (Trapp et al., 2014), while the decreasing stress level may increase the telomerase gene expression and reduce the blood pressure (Duraimani et al., 2015).

Limitation study

The intervention in this study was only one session. There is an age difference between the group held by the fingers and the group breathing deeply. this is due to weaknesses in the sampling technique carried out by researchers.

Conclusion

Both finger and deep breathing techniques are equally effective in reducing stress levels experienced by patients suffering from primary hypertension. The relaxation technique holding the fingers is more effective in reducing heart rate than the deep breathing relaxation technique. The research needs to be continued with several different interventions and measurements and sampling techniques

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Characteristics of Patients, Self-Efficacy and Quality of Life among Patients with Type 2 Diabetes Mellitus

Karina Megasari Winahyu[1], Revi Anggita[2], Giri Widakdo[3]
[1,2]Faculty of Health Science, Universitas Muhammadiyah Tangerang, Tangerang, Banten, Indonesia
[3]Faculty of Nursing, Universitas Muhammadiyah Jakarta, Jakarta, Indonesia
Corresponding email: karinawinahyu@yahoo.com

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Abstract

Diabetes mellitus as a chronic disease requires a long-term care, which influence the quality of life (QOL). A mechanism perceived by the patients who engage in long-term treatment, such as self-efficacy (SE) is prerequisite for the success of disease management. The study aimed to identify the relationship between characteristics of patients, SE and domains of QOL among patients with type 2 diabetes mellitus (T2DM) living in community. The study used a correlational analytical with a cross-sectional approach and recruited 105 patients with type 2 diabetes in Sukasari Public Health Center, Tangerang. Self-administered questionnaires were used to measure sociodemographic of T2DM patients, while the Diabetes Management Self-Efficacy Scale (DMSES) UK and Asian Diabetes Quality of Life (Asian DQOL) were used to measure SF and QOL, respectively. Data were analyzed using Spearman Rank-Order Correlation. The study revealed that characteristics of patients, including age and period of illness were negatively associated with memory and cognition domains of QOL, while years of education positively associated interpersonal relationship domains of QOL. For SE, it was positively significant associated with diet habit, energy, and financial aspects domains of QOL. The SE was positively associated with the QOL ($r=0.31$; p-value ≤ 0.01). The SE is relationship with QOL of T2DM. Therefore, health care provider should need to maintain the domains of QOL through improving SE, while considering the characteristics of T2DM patients, including age, period of illness, and years of education.

Keywords: Characteristics of patients, self-efficacy, type 2 diabetes mellitus, quality of life domains.

Introduction

Diabetes mellitus is a global concern since its chronicity impairing and devastating for the life of the people living with the disease. It is no longer affected developed country but also developing country. Report of International Diabetes Federation (IDF) in 2017 revealed that there are 425 million of people with diabetes and predicted to reach up to 48 % in 2045 in the world. Moreover, South East Asia was the top prevalence since there are 82 million of people with diabetes compared to other region around the world (International Diabetes Federation, 2017). Indonesia as a low middle income county contributed to 7.6 million of people with diabetes mellitus (DM) and made to be the fourth largest country related to number of undiagnosed diabetes for aged 20–79 years old in 2017 (International Diabetes Federation, 2017). The rising prevalence of the disease showed that many people with diabetes who will experience the long term treatment, which could affect their quality of life. Moreover.

Quality of life among patients with diabetes mellitus is an important issue since chronic disease could impair some domains of patient's life. Quality of life is a concept that relates to the well-being of patients in terms of physical, psychological, social and environmental (World Health Organization, 2019). The length of time suffering from diabetes mellitus and the treatment that is undertaken can affect the functional, psychological, and health capacity and quality of life of patients (Wahyuni, Nursiswanti, & Anna, 2017). Most of patients with Type 2 Diabetes Mellitus reported poor quality of life (Yamin & Sari, 2018). Quality of life of patients with diabetes mellitus is one of the main focuses in treatment. Quality of life is very important to get serious attention since it closely related to morbidity, such as patients with emotional distress are more likely to decrease their QoL (Gomez-Pimienta et al., 2019). In addition, the ability to manage diabetes will affect the QoL (Afzan et al., 2018).

Self-management in diabetes is necessary for the patient to engage in the long term-care, and one strong predictor of diabetes management is self-efficacy (Kim, Song, & Kim, 2019). Moreover, good management of diabetes lead to better health outcome. It was consistent with previous study found that self-efficacy was one of several factors affecting the quality of life among patients with diabetes mellitus (Rahman & Sukmarini, 2017).

Self-efficacy is an individual's belief in the ability to self-regulate and carry out the tasks needed to achieve the expected results. Self-efficacy determines individuals to feel, think, motivate themselves and behave to achieve the desired goals (Bandura, n.d.). Self-efficacy in patients with diabetes mellitus focuses on their beliefs about their ability to perform diabetes self-care behaviors (Al-Khawaldeh, Al-Hassan, & Froelicher, 2012). Self-efficacy encourages self-control processes to maintain the behaviors needed to manage self-care in patients (Gedengurah, 2011). Self-efficacy in type 2 diabetes mellitus patients focuses on patient confidence to be able to perform behaviors that can support the improvement of their disease and improve self-care management such as diet, physical exercise, medication, glucose control and treatment of diabetes mellitus in general (Gedengurah, 2011).

Most of study on self-efficacy and the quality of life among patients with type 2 DM obtained from various standard instruments, which constructed from western culture. The existence of differences in measuring instruments and the limited studies in Indonesia using instruments that have been found to be most effective and in accordance with culture of Indonesia. Therefore, this study want to identify the association between characteristics of patients, self-efficacy and domains of quality of life among patients with type 2 diabetes mellitus in Indonesia.

Method

This study was a correlation analysis with a cross-sectional approach. This study was conducted at Sukasari primary health center (puskesmas) in Tangerang City from April to June 2018. Participants in this study were 105 patients with type 2 diabetes mellitus. The Participants were selected by consecutive sampling technique. The inclusion criteria

participants in this study were type 2 diabetics who have had diabetes for at least one year, can communicate verbally, able to provide informed consent. Meanwhile, patient with dementia or Alzheimer's disease were excluded in this study.

The characteristics of patients comprises of gender, marital status, level of education and period of illness were measured by self-reported questionnaire developed by the researcher. Moreover, the instrument used to measure the quality of life in this study is the Asian Diabetes Quality of Life (Asian DQoL). The Asian DQoL instrument is a tool developed by Goh in 2014 and has been tested on the Malaysian and Singaporean population which is considered a representation of ethnic Malays, Chinese and English living in Asia (Goh, Rusli, & Khalid, 2015). It consists of 21 items, including financial, diet, memory and cognition, energy and relationship component. This 5 Likert scale measured quality of life which higher score indicates higher quality of life. The researchers have been allowed to use the Asian DQoL instrument in this study. This instrument has been tested for validity and reliability with a Cronbach alpha value of 0.91.

The instrument used to measure self-efficacy in this study was the Diabetes Mellitus Self Efficacy Scale of the United Kingdom (DMSES UK). DMSES UK is an instrument developed by Sturt in 2009. This questionnaire consists of 15 items with 0 to 10-point scale, which higher score indicating high self-efficacy. The DMSES UK can be used to measure self-efficacy for self-care for type 2 diabetes both in clinical areas and in the study area (Sturt, Hearnshaw, & Wakelin, 2010). This instrument has been tested for validity and reliability with a Cronbach alpha value of 0.95.

Prior to data collection, this study had been granted ethical approval from Health Research Ethics Committee with letter number 445/089-KEP-RSUTNG. The data collection was done by interviewing prospective participants to identify participants for this study. The researcher explained the procedure and asked for willingness of the recruited participants to fill out informed consent.

The data in this study were not normally distributed. Therefore, the association between characteristics of patients, including age, years of education, period of illness, self-efficacy and all domains of quality of life were measured by Spearman Rank-Order Correlation analysis ($p < .05$).

Results

Characteristics of patients

Out of 105 patients with type 2 diabetes mellitus, 70.5 % were female, the marital statuses were married (80 %), and levels of education were senior secondary school (42 %). Out of the total respondents, period of illness ranged from 1 year until 20 years (M = 6.18 years, SD = 4.67 years) and 71.5 % were age of 56-65 years old.

Association between characteristics of patients, self-efficacy and quality of life.

Results of the Spearman correlation indicated that there were no significantly association between characteristics of patients and quality of life (Table 1). However, there was significant association between

Table 1 Association between Characteristics of Patients, Self-Efficacy and Quality of Life among Patients with Type 2 Diabetes Mellitus (N = 105)

Variables	Age	Years of Education	Period of Illness	Self-Efficacy
Quality of Life	-0.04	0.06	-0.12	0.31**
• Diet habit	0.10	0.15	-0.16	0.47**
• Energy	-0.06	0.02	-0.09	0.40**
• Memory and cognition	-0.21	-0.12	-0.35**	0.08
• Financial Aspects	0.08	0.04	-0.11	0.32**
• Interpersonal relationship	0.00	0.23*	-0.01	0.13

*Note: *p < .05; **p < .001*

characteristics of patients and quality of life domains. A positive correlation was found between years of education and interpersonal relationship domain (r= .23; p= .032); a negative correlation between period of illness and memory & cognition domain (r= -.35, p =.000) ; a positive correlation between age and memory and cognition (r= .21; p= . 032). It is showed that self-efficacy was positively correlated with quality of life. Moreover, self-efficacy was associated with diet habit, energy, and financial aspects domains.

Discussion

The results of this study found that there were relationships between characteristics of patients, self-efficacy and QoL among patients with type 2 diabetes mellitus. It was consistent with results from previous studies (Amelia, Ariga, Rusdiana, Sari, & Savira, 2018; Wang, Chen, Yang, & Juan, 2017), which will be explained further as follows.

The result of this study showed that characteristics of patients with DM had association with some domains of QoL. Concerning the association between age and memory and cognition indicated that T2DM patients who are older more like to perceive lower score on memory and cognition. As people become older, their memory and cognition function could deteriorate (Bahk & Choi, 2018). It was supported that 75 % of the age of respondents are ranged 56–65 years old. Moreover, the complexity of the diabetes management could be related to how these patients perceive their satisfaction in terms of ability to recall or recognize events or things.

Concerning the relationship between period of illness and memory & cognition, it showed that patients with DM who had longer period of illness more likely to show a decline of recalling ability. A study of Hazari et al. indicated that patients with disease duration over 5 years were more prominent to experienced cognitive deterioration (Hazari, Ram Reddy, Uzma, & Santhosh Kumar, 2015). However, there were no significant relationship between the duration of illness and cognitive function in previous study. The inconsistency might because of the cognitive function in the present study was measured by decision making and memory recall power, while the previous study measured the cognitive function by P300 that use a speed of neural events linked to short memory.

Regarding the self-efficacy, the results showed that self-efficacy was associated with some domains of QoL, including dietary habit, energy, memory and cognition, and financial aspects. Perceived self-efficacy is the beliefs about own competencies to accomplish any task, which influence to the life through four psychological processes, such as cognitive, motivation, affective and selection process (Bandura, n.d.). Self-efficacy perceived by the patients could be an important factor that make people achieve difficult task as a challenge and immerse in their activities. For instance, patients with diabetes who perceived high self-efficacy will be more motivated to engage to the diet for DM since the patients feel confidence to be able to complete the dietary requirement.

The change as the impact of the diabetes perceived by the patients as a challenge need to be managed appropriately. Furthermore, the patients will be more likely to fulfil their regimen eagerly. According to Bandura, self-efficacy affects people to reduce stress since any threatening conditions recognized as an experience that they can control over them (Bandura, n.d.). The finding of this study was in line with a previous study stated that perceived self-efficacy associated with quality of life domains (Amelia et al., 2018; Bowen et al., 2015; Kurnia & Kusumaningrum, 2017; Walker, Smalls, Hernandez-Tejada, Campbell, & Egede, 2014). People who perceived higher self-efficacy tend to be able apply diabetes management, including diet, regiment, and exercise requirement. Consequently, the patients who have high self-efficacy will eventually have a good management of the disease, leading to perceive higher satisfaction in their aspects of life.

Conclusion

The findings revealed that the characteristics of patients and self-efficacy were significantly associated with quality of life domains. The

study suggests that the higher score of quality of life domains will be achieved by enhancing self-efficacy perceived by the patients with diabetes. Thus, this study can be a baseline data to develop self-efficacy intervention for improving the QoL by considering group of patients related to their age, years of education and period of illness.

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Determinant Factors of Fertility in Reproductive Age Women

Rindang Ekawati[1], Laili Rahayuwati[*2], Ikeu Nurhidayah[3], Habsyah Saparidah Agustina[4], Endah Rahayu[5]
[1]National Population Board, Bandung, Indonesia
[*2,3,4,5]Faculty of Nursing, Universitas Padjadjaran, Bandung, Indonesia
Corresponding email: laili.rahayuwati@unpad.ac.id

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Abstract

The target of the 2015 Medium-Term National Development Plan is the fertility rate of 2.1 children. However, based on The Indonesian National Demographic and Health Survey 2017, the fertility rate of West Java Province is similar to the national, which is 2.4 children. West Java is a barometer of the national fertility rate since one-fifth of Indonesia's population is in West Java. This study aims to analyze the factors that influence fertility (number of children ever born). The design of this study was cross-sectional. Data derived from the 2018 Survey of Accountability Programs Performance covered 12,350 women aged 15-49 years. The sample was 9,814 woman who had been married. Data analysis used univariate, bivariate and multivariate analyses with a confidence level of 0.05. Bivariate results found that five variables that affected fertility were the age of first marriage, frequency of marriage, use of contraceptive, ideal family size, and wealth index, while the area of residence was not related to fertility. Indeed there are three most dominant factors that have been related to fertility were the age of first marriage, frequency of marriage, and the use of contraceptives. The conclusion was that women who marry at an older age and use contraception have lower fertility rates. This study can be considered in population control policies, especially to improve health promotion programs regarding the ideal marriage age for women and the use of contraception as an effort to control the population rate. This study can be considered in population policies.

Keywords: Age of first marriage, children ever born, fertility, reproductive-age women, use of contraception.

Introduction

The population is the core capital of development and the indicator for sustainable development (Wicaksono & Mahendra, 2016). However, its uncontrollable rise can obstruct the effort to improve and ensure the people's prosperity (Sinaga, Hardiani, & Prihanto, 2017). One of the factors that influence the number of people and growth rate is fertility (Arsyad & Nurhayati, 2017; Bongaarts, 2015).

Today, some developing countries such as Indonesia are mitigating fertility to keep balance of the number and the quality of its population. Although it has implemented the Family Planning program since 1968, the total fertility rate (TFR) remains quite high. The government's target is to curb the TFR to 2.1 in 2020 (BKKBN, 2018). However, the survey result shows that it only decreased from 2.6 children in 2012 to 2.4 in 2017 (Indonesian Health and Demographic Survey [Survey Demografi dan Kesehatan Indonesia, SDKI], 2017). The national fertility data is generally absorbed from the data in West Java province as the province with the most significant population in Indonesia, one-fifth of which lives there. The SDKI-based fertility data in West Java showed a slight decrease from 2.5 in 2012 to 2.4 in 2017.

Challenges caused by the high TFR in developing countries will impact reproductive health problems such as mother and child death, premature babies, domestic problems like emotional contention, divorce, low chance of good education, and poor socio-economic status (Ministry of Women Empowerment and Child Protection & Central Statistics Agency, 2019). Therefore, factors affecting the decrease of TFR is an important moot for the Indonesian government.

Total fertility rate (TFR) is a concrete reproduction result of someone or a group of women, while in the definition of demography is measured by the number of children ever born (ALH) (Mulmi, 2018). Bongaarts (2015) suggested the model about factors affecting fertility as the revision of (Bongaarts, 1978; Davis & Blake, 1956; Freedman, 1961). This model explains fertility affected by intermediate variables including intercourse (age of first marriage and frequency of marriage), contraception (use of contraceptives), and gestation variable. On the other hand, the background determinants include demographics, socio-economic status (wealth index, education, and occupation), and socio-cultural context including ideal family size (Arsyad & Nurhayati, 2017; Awad & Yussof, 2017; Bongaarts, 2015; Febrina, Amalita, & Murni, 2014; Lestari, Musa, & Roy, 2018a; Marlina, Normelani, & Hastuti, 2017; Mulmi, 2018; Rahmayeni Zulwida, 2016)

Therefore, the factors affecting fertility in Indonesia is worth considering. Previous research regarding determinant factors of fertility include the age of first marriage, frequency of marriage, and the use of contraceptives, results differently. Women who got married at 21-25 age have a higher chance of having more than two children, compared to those who got married at a younger or older age. Besides, previous research shows that the older the marriage, the less the children ever born is likely to happen (Arsyad & Nurhayati, 2017; Lestari, Musa, & Roy, 2018; Sinaga et al., 2017; Upadhyay & Bhandari, 2017).

The frequency of marriage can affect the number of children ever born, but not many previous research discussing the former relating to the latter. Stone (2018) shows that since 2009, the fertility of women who got married in America is getting lesser, but those who are widowed and have been married for more than once have a higher fertility rate because those women want to have children from their partners. The more-than-one frequency of marriage may increase the risk of having many children.

Arsyad and Nurhayati (2017); Bongaarts (2015), the use of contraceptives has a direct impact on children ever born or fertility rate. It enables couples to reach the expected ideal family size and prevent unwanted births. It also has a positive impact on the fertility rate Arsyad and Nurhayati, (2017); Wicaksono nd Mahendra, (2016) so that it can help prevent birth or manage birth intervals. However, Mulmi, (2018) claims that there is no relationship between the use of contraceptives and the number of children ever born because most respondents did not use contraceptives. Research from also has a similar view, saying

that contraceptives are only used to measure birth intervals but not to limit it.

Based on the theory of Bongaarts (1978), Bongaarts (2015) and Davis and Blake (1956) Indirect factors affecting fertility include socio-economic factors reflected by wealth index, ideal family size as the socio-cultural factor, and the area of residence as a demographic factor. Based on Lestari et al. (2018) the higher the family's income, the higher the number of children ever born because parents feel financially capable of giving more births. The amount of primary needs borne by the parents with the number does not prevent them from increasing the number of births. Indonesia has the belief that having many children equals future economic privileges. The research goes against that of Arsyad and Nurhayati (2017), saying that the amount of wealth has a negative correlation to children ever born. It concludes that the number of children ever born may lower once the wealth quantile index rises.

The values held in a community or society can have an impact on the fertility rate (Freedman, 1961). The impact of norms on the fertility rate was first coined by Freedman (1961) with a revision argument on the model developed by Davis and Black 1956 and Bongaart 1978. On the latest proposed model from Bongaarts 2015 through the scheme on "Modelling the Fertility Impact of the Proximate Determinants: Time for a Tune-Up," saying that the values or norms will become environmental index that determines the fertility in a region. The research by Arsyad and Nurhayati, (2017) shows that there is a significant relationship between the number of children wanted and children ever born. This study is supported by (Khongji, 2013) that the ideal family size may influence fertility in a region. This condition is affected by the cost factor, including socioeconomic status, cultural values, and religious values growing in that region. Therefore, this factor becomes vital to observe within the context of Indonesians with deeply-rooted cultural and religious values.

The area of residence is divided into villages, cities, or abandoned and developed regions. These categories can influence fertility because an individual's area of residence will impact social behaviors (Gee, 1990; Sunaryanto, 2012). Sunaryanto (2012) states that women living in metropolitan cities tend to have a low fertility rate. It is because respondents are working women that want lesser children. This research is supported by Raharja (2014) and Arsyad and Nurhayati (2017), claiming that women living in the city have a lesser chance of giving birth compared to those in villages.

Factors affecting fertility are the age of first marriage, frequency of marriage, use of contraceptives, wealth index, ideal family size, and area of residence. Knowing the always dynamic demographic situation in Indonesia, it is necessary to update factors regarding fertility. Therefore, this research aims to identify the fertility determinant factors, both immediate and non-immediate. This study is expected to provide information on dominant factors affecting fertility rate and become a suggestion for the decision-makers in formulating a policy of population control through The Program of Population, Family Planning, and Family Building.

Method

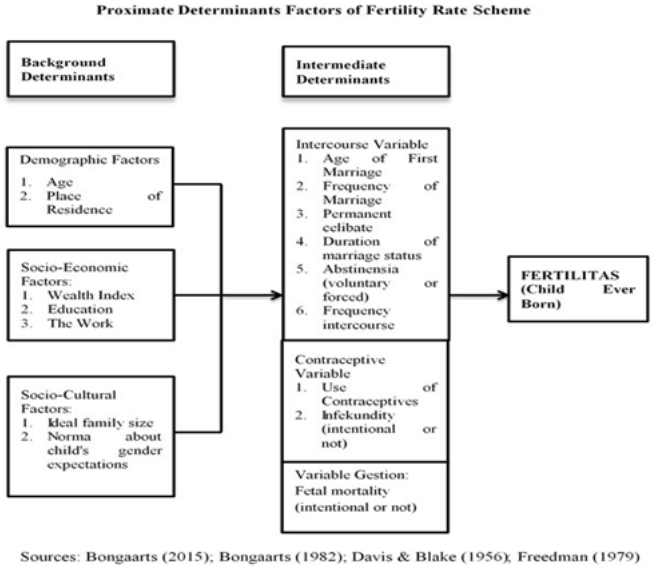
This research uses secondary data from Survey of Performance of Program Accountability (Survey Kinerja dan Akuntabilitas Program [SKAP]) 2018. SKAP is a national-scale survey that collects data about women's reproductive health program, family planning, and media exposure on information about citizenship, family planning, women's reproductive health, and family endurance and empowerment.

This research uses a cross-sectional approach, specified to the data in West Java Province. The population consists of reproductive-age women in West Java as much as 22.712.982 million people. The samples are 12.350 women aged 15 to 49 years old. The available samples are 9.814 reproductive and married women. The dependent variable in this research is measured by children ever born. Meanwhile, the independent variables include direct factors: the age of first marriage, frequency of marriage, use of contraceptives, and non-intermediate factors such as wealth index, ideal family size, and the area of residence.

This study is a secondary analysis of the SKAP 2018 survey. The procedure of this research was carried out with stratified multistage sampling, with the following stages: 1) The first stage of the sample framework was a list of villages throughout West Java, supplemented by urban/rural classification information. 2) The second stage of the sample framework was the list of clusters in the selected village; 3) The third stage of the sample framework was the listing of households or the results of listing households in selected clusters conducted door-to-door by enumerators. Then, the enumerator will choose 35 households by systematic random sampling based on the results of the household listing conducted by door to door. Determination of 35 households based on the sufficiency of the number of cases to be able to provide information per cluster containing about 200-250 households. The enumerator then retrieves data using a household questionnaire, which contains a questionnaire about reproductive-age women's health, the history of children ever born and the factors that influence it. This research was conducted by upholding the ethical principles of research. This study has been approved by the Ethics Review Board, based on a Certificate of Ethics Review from the National Population and Family Planning Agency, Number 1281/PD.101/H4/2018 on April 30, 2018.

The analysis of data used univariate, bivariate, and multivariate analysis. The univariate analysis described the distribution of frequency of all variables, including independent and dependent. Bivariate is an analysis of the relationship between each independent and dependent variables. Multivariate is to determine the most dominant variable that contributes to the number of children ever born using logistic regression. The steps in the modeling of compound logistic regression are as follows: Doing a bivariate analysis to determine which variable to be the model candidate. Each independent variable is correlated to dependent variables (chi-square test used as a bivariate test). Then a selection of variables will be included in the multivariate modeling if the p-value<0.25. In this research, all independent variables go into the modeling (the age of first marriage, frequency of marriage, use of contraceptives, wealth index, ideal family size, and the area of residence).

The next step is multivariate analysis using logistic regression. In this step, where variables have p-value >0.05 is indicated and issued one by one from the model. This step is done chronologically starting from variables with the biggest p-value, which is the ideal family size (p=0.999), then the wealth index (p=0.128). Therefore, we will



Picture 1 Proximate Determinants Factors of Fertility Rate Scheme

get the latest multivariate modeling. Below will be explained the scheme of the design in this research.

Results

Table 1 Frequency Distribution of Children Ever Born, Age of First Marriage, Frequency of Marriage, Use of Contraceptives, Wealth Index, Ideal Family Size, and Area of Residence on Respondents (n=9814)

Variable	Frequency	Percentage (%)
Children Ever Born:		
0-2	6826	69.6
>2	2988	30.4
Age of First Marriage:		
<15 years	784	8
15 – 20 years	4771	48.6
20 – 30 years	4053	41.3
>30 years	206	2.1
Frequency of Marriage:		
Only Once	8552	87.1
More Than Once	1262	12.9
Use of Contraceptives:		
Using	8685	88.5
Not Using	1129	11.5
Wealth Index:		
Lower Wealth index	3399	34.6
Middle Wealth index	4158	42.4
Upper Wealth index	2258	23.0
Ideal family size:		
1	11	2
1–2	5786	59.0
3–4	3700	37.7
>4	317	3.2
Area of Residence:		
City	6581	67.1
Village	3233	32.9

Table 2 Analysis of Relationship between Age of First Marriage, Frequency of Marriage, Use of Contraceptives, Wealth Index, Ideal Family Size, and Area of Residence with Children Ever Born on Respondents (n=9814)

Variable		Children Ever Born Category				Total		p-value	Odds Ratio
		0 – 2		>2					
		f	%	f	%	f	%		
Age of First Marriage:	<20 years	3464	62.4	2091	37.6	5555	100	0.000*	341.440

	20 – 30 years	3165	78.1	888	21.9	4053	100		
	>30 years	197	95.6	0	4.4	206	100		
	Total	6826	69.6	2988	30.4	9814	100		
Frequency of Marriage:	Only Once	6124	71.6	2428	28.4	8552	100	0.000*	131.907
	More Than Once	702	55.6	560	44.4	1262	100		
	Total	6826	69.6	2988	30.4	9814	100		
Use of Contraceptives	Yes	5844	67.3	2841	32.7	8685	100	0.000*	183.322
	No	982	87.1	146	12.9	1128	100		
	Total	6826	69.6	2987	30.4	9813	100		
Wealth index:	Lower Wealth index	2170	63.8	1229	36.2	3399	100	0.000*	80.026
	Middle Wealth index	3019	72.6	1138	27.4	4157	100		
	Upper Wealth index	1636	72.5	621	27.5	2257	100		
	Total	6825	69.6	2988	30.4	9813	100		
Ideal family size:	0	5	100	0	0	5	100	0.000*	506.553
	1–2	4526	78.2	1260	21.8	5786	100		
	3–4	2139	57.8	1561	42.2	3700	100		
	>4	156	49.2	161	50.8	317	100		
	Total	6826	69.6	2982	30.4	9808	100		
Area of Residence	City	4536	68.9	2045	31.1	6581	100	0.056	3.631
	Village	2290	70.8	943	29.2	3233	100		
	Total	6826	69.6	2988	30.4	9814	100		

Table 3 Modeling of the End of Analysis on Determinant Factor Most Impactful to the Number of children ever born to Respondents

Variables	B	SE	Wald	OR (95%CI)	p-Value
Age of First Marriage	2.355	0.337	48.929	10,543 (5,449-20,397)	0,000*
Frequency of Marriage	0.551	0.064	74.484	1,735 (1,531-1,966)	0,000*
Use of Contraceptives	-1.120	0.093	143.954	0,326 (0,272-0,392)	0,000*
Area of Residence	-0.330	0.049	44.944	0,719 (0,653-0,792)	0,000*
Constants	1.852	3.64	25.921	0.157	0,000*

Table 1 is the result of distribution analysis of the frequency of children ever born, age of first marriage, frequency of marriage, use of contraceptives, and area of residence on respondents (n=9814). The result shows that most respondents (69.6%) have 0 to 2 children ever born. Nearly half (48.6%) of the respondent's age of first marriage is 15 to 20 years old, but 8% of respondents got married above 15 years old. In terms of the norm of ideal family size or the expected number of children, almost 60% of the respondents want to have 1 to 2 children, while 40% others want more than three children. In the wealth index category, nearly half of the respondents (42.4%) are in the middle category, but 34.6% are in the lower wealth index category. According to the area of residence, most respondents (67.1%) live in the city. Almost all respondents (87.1%) have been married once. Regarding the use of contraceptives, almost all respondents (88.5%) have used contraceptives.

Table 2 explains the relationship analysis between the age of first marriage (UKP), frequency of marriage, use of contraceptives, wealth index, ideal family size, and the area of residence with children ever born on respondents (n=9,814). The result of relationship analysis between all independent variables with the number of children ever born, showing that five (5) variables with valuable relationships. Those variables are: 1) the age of first marriage (p=0.000); 2) frequency of marriage (p=0.000); 3) history of use of contraceptives (p=0.000); 4) wealth index (p=0.000); and 5) ideal family size (p=0.000). Meanwhile, the area of residence does not have any valuable relationship with the number of children ever born (p=0.056), but it still included in the multivariate analysis because the p-value was <0.25.

The respondents whose first marriage age is younger (<20 years) tend to have higher children ever borns (>2 people). It is also seen in this study, that respondents having 0 to 2 children ever born are those only married once. The more the frequency of marriages increases, the more chance a woman has more children. Respondents using contraceptives mostly have <2 children ever borns. Respondents having 0 to 2 children ever born tend to have higher of respondents having a wealth index on the medium and high category. Conversely, respondents having children ever born >2, most respondents have a lower wealth index.

Respondents having 0 to 2 children ever borns are mostly found on those wanting two children or less. Conversely, those having >2 children ever borns are respondents wanting to have more than two children. In terms of the area of residence, the research result shows there is no significant difference between the area of residence and the number of children ever born, but the respondents having more than two children ever born mostly live in the city.

From the overall analysis process, it can be concluded that out of six variables thought to be related to children ever born, there are four variables that are significantly related: the age of first marriage, frequency of marriage, use of contraceptive, and the area of residence. The respondents with marriage age of 15 to 30 years have a chance of 10.53 times higher to have children ever born>2 compared to those with marriage age of >30 years old after controlled by other variables. In this study, the village residence is a protective factor for having more than two children. Respondents who lived in cities are 0.719 times more likely than respondents who live in villages to have more than two children. The equity (1) is an equity model of logistic regression, as explained below:

Children Ever Born = -1,852 -2,355* Age of First Marriage – 0,330* Area of Residence +0,551* Frequency of Marriage - 1,120* Use of Contraceptives

The equation model (1) can be estimated that the number of children ever born using three intermediate variables (first marriage age, frequency of marriage and use of contraceptives) and one non-intermediate variable, that is the area of residence. If the coefficient B value is positive, the coefficient B value is negative. For example, in the variable of use of contraceptives -1.120, meaning there is a decrease of childbirth 1.120 if the respondents use contraceptives, controlled by the age of first marriage, frequency of marriage, and area of residence.

Age of first marriage and frequency of marriage have a significant relationship on the increase of children ever born. Respondents with the age of first marriage below 20 years old has a risk of 2.55 times to have children ever born >2. The respondents with the frequency of marriage +0.551 will increase the chance of children ever born as much as 0.551 after being controlled with the variable of the age of first marriage, use of contraceptives, and the area of residence. Living in villages becomes the protective factor to have children ever born >2 as much as 0.33 times, meaning that respondents living in the city have a risk of 0.33 times higher to have children >2.

On the Beta column, we can identify which variable is the biggest in determining the dependent variables (children ever born). The bigger the Beta value, the more significant the impact on dependent variables. In this research, it can be concluded that the younger the first marriage age, the marriage frequency >1, does not use contraceptives and live in the city can lower the risk of having children ever born >2.

Discussion

Viewed from the result of the multivariate test, the age of first marriage is the most dominant factor that determines the fertility rate. The age of first marriage may sustain the chance of reproduction (Arsyad & Nurhayati, 2017; Mulmi, 2018; Upadhyay & Bhandari, 2017). The explanation about the relationship between the age of first marriage and the fertility rate is inverse, meaning that the higher the age of first marriage, the lesser the fertility rate (Larasati et al., 2018; Pratiwi & Herdayati, 2014). A society where most are women does their first marriage at a young age. The birth rate is higher than those whose first marriage is done at an older age in their life (Ekawati, 2008). Research in India states that teenage marriage will increase the chance of a higher fertility rate as much as 2,355 times. This research reveals that married respondents less than 20 years old are the greatest contributor for the family with children ever born >2. Therefore, it is necessary to educate about the ideal marriage age for women or would-be brides.

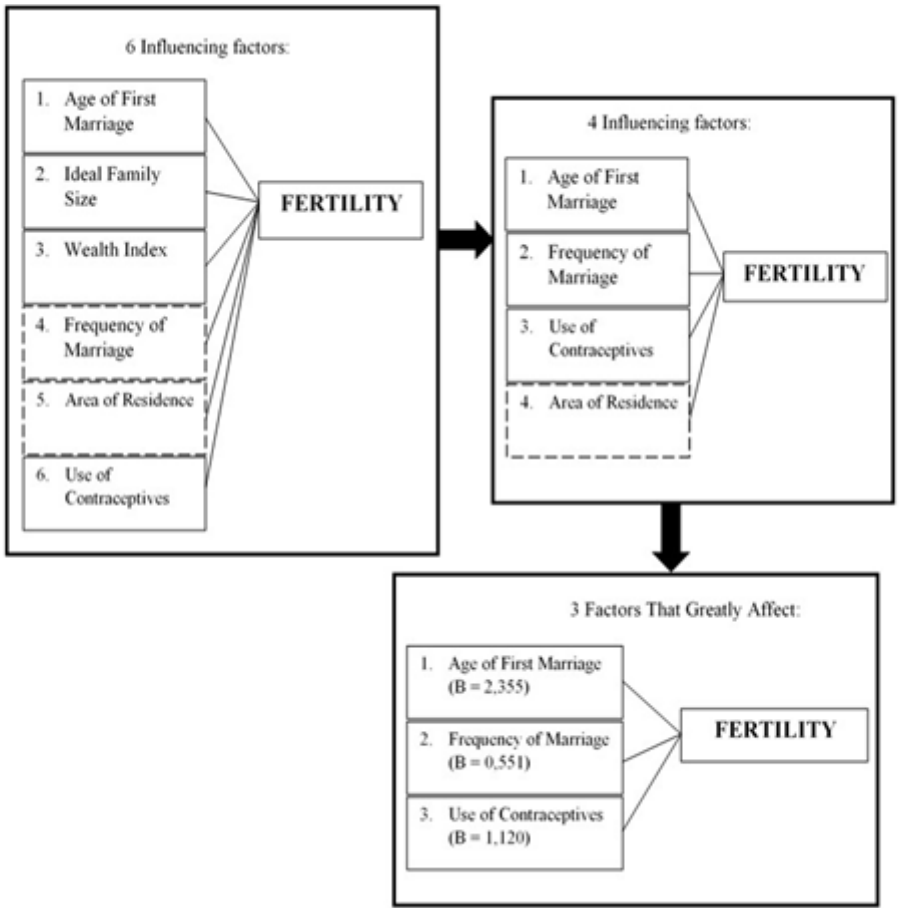
Another dominant factor affecting children ever born in this research is the frequency of marriage. It affects the fertility rate because most of the respondents are at a young age. Therefore, the time of reproduction increases and is the potential to marry again if divorced. It causes the increase of children ever born. This research also shows a positive relationship between the frequency of marriage and the number of children ever born, meaning that the more frequent a woman marries, the higher the chance of having more children ever born.

The last modeling in table 3 shows that the use of contraceptives is very much related to the number of children ever born with B value -1,120 (p=0.000). A negative beta value means that contraceptive use is a protective factor. It means that the use of contraceptives will reduce the chances of a woman to have more than two children. The results of this study are in line with Arsyad & Nurhayati, (2017; Bongaarts, (1978), Bongaarts, (2015); Davis and Blake, (1956); Wicaksono and Mahendra, (2016) which states that the use of contraceptives are the main protective factor to control fertility rate in a region. Therefore, the program of population control through The Family Planning Program is still relevant to the problem context of Indonesians today. Although some research reports that the family planning program is out of date, as stated by Lestari et al., (2018) that report in Samarinda villages, the use of contraceptives do not affect fertility rate. Mulmi, (2018) also report that the same thing happens in India. However, there are some weaknesses in Lestari, Musa, and Roy, (2018) study, including the limited number of samples that

only cover one village in the Kalimantan region, while in this study the sample is large, covering villages and cities throughout West Java, so it is quite comprehensive representing households in West Java Province.

This study indicates that the socio-economic status reflected in the wealth index has a significant relationship to fertility rate. The respondents with fewer children ever born (0-2) are middle class and above, while those with low wealth index has more children ever born (>2). This research aligns with that of Upadhyay and Bhandari (2017) in India, stating that family with the lowest income in India has the highest fertility rate, compared to those with lower economic status. It might correlate with other factors, including families with low economy or education status (Upadhyay & Bhandari, 2017).

The results of this study indicate that respondents with middle to upper economic levels have fewer children due to several possible factors. One factor is the shift in perspective of the upper-middle class in having children (Sunaryanto, 2012). The children are not only seen in terms of universal usability but also economic burden due to some costs in life aligned with the number of children ever born (Sunaryanto, 2012). Furthermore, Sunaryanto explains that the costs to spend while having children include: education, health, operational needs, and nutrition improvement. Therefore, families with a high wealth index with a higher education level will have to think about whether they should add more children ever born. However, in this research, the wealth index is not a dominant factor in determining the fertility rate in West Java. The following image is the summary of dominant factors affecting the fertility rate in West Java (Image 2).



Picture 2 The Stages of Multivariate Analysis

Conclusion

Based on the analysis result, it can be concluded that the dominant determinant factor of fertility is the first marriage age, frequency of marriage, and the use of contraceptives. This research can be a means of consideration to make decisions about population control, specifically in West Java Province and the education about the ideal marriage age for women or to-be brides as well as the education on the use of contraceptives in the family planning program.

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