

The impact of premenopausal empowerment model based health belief model to changes in physical activity levels in controlling complaints of perimenopausal women in Pematangsiantar City, Indonesia, 2017

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SUMMARY: The impact of premenopausal empowerment model based health belief model to changes in physical activity levels in controlling complaints of perimenopausal women in Pematangsiantar City, Indonesia, 2017.

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Physical activity is defined as any body movement produced by skeletal muscles that increases power/energy spending. Lack of physical activity is an independent risk factor for chronic diseases and is the overall estimated leading cause of death globally. Physical activity coupled with regular exercise can be used as an alternative effort to reduce perimenopausal complaints due to estrogen deficiency. Although a normal phase, perimenopause is characterized by complaints that may interfere with daily activities. Short term complaints usually include rheumatic pain, anxiety, muscle aching, neuropathy, night sweating, hot flushes, whereas

long-term complaints include osteoporosis, myocardial infarction, increased cholesterol levels, overweight and carbohydrate metabolism disorders. Early prevention measures are necessary in order to establish a healthy life style.

This quasi experimental study included 70 women aged 40 to 45 years, which were evenly divided in two groups, the study and control group. Data were analysed to observe changes prior to and after the intervention was given and the effects of the intervention on levels of self reliance. Data on sports were univariately analyzed. Bivariate analysis was performed using the Shapiro-Wilk test and t-test dependent.

Results showed that the Premenopausal Empowerment Model (PEM) significantly changed health belief, indicated by an increase in health belief scores (9.96 ± 17.15) with $p = < 0.001$, and physical activities (0.35 ± 0.48) with $p = < 0.001$. Therefore PEM should be recommended as an intervention to help develop a sustainable healthcare system especially for menopausal women through peer education.

KEY WORDS: Physical activity - International Physical Activity Questionnaire - Empowerment - Premenopause - Perimenopause.

Background

With increased age, every women will experience a transition from a reproductive period to a non reproductive period known as menopause, which based on a study by Siregar M.F.G. (2016), alternatively, can be diagnosed by vaginal pH $\geq 5,5$ (1, 3). This period is characterized by decreased hormone levels and cause various complaints, the degree of which vary between each individual. These complaints range from very mild symptoms to severe life disturbing symptoms (both physical and psychological), and is known as the climacteric syn-

drome. Symptoms include hot flushes and night sweats, insomnia, and vaginal dryness, osteoporosis, arteriosclerosis, dyslipidemia, decreased mood, irritability, and headaches. A study by Siregar M.F.G. et al. (2016) showed that based on the Menopause Rating Scale (MRS), 50-56 year old women mostly complained these symptoms (2, 4).

A study conducted in the town of Pematang Siantar at 2009 on 210 respondents aged 46-55 years who were experiencing perimenopause reported ten (out of 22 complaints in the climacteric syndrome) most frequent complaints: irritability (83.3%), leg tingling (68.1%), rheumatic pain (68.1%), headache (59.5%), anxiety (56.2%), missing sexual arousal (54.8%), difficulty reaching orgasm (52.8%), myalgia (51.4%), sleeplessness (49.5%) and no concentration (49.1). As much as 92.4% of 210 women examined experienced climacteric complaints, with 138 of them (67%) were workers (3). Memory problems during menopause are also frequently reported, which is supported by results from Siregar M.F.G. (2016) who reported states that the increased

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cortisol levels > 10 ng/ml was associated with psychological disorders during perimenopause (4, 7).

Women experiencing these premenopausal complaints usually have a negative belief on their future health life. In this matter, physical activities are expected to change this belief. Premenopausal women must believe that they have some control over the complaints and resulting consequences that affect their lives. Physical activity is any body movement produced by skeletal muscles that increase energy expenditure/energy, which is categorized as adequate when a person physically exercises for 30 minutes every day or at least 3-5 days in a week.

International Physical Activity Questionnaire (IPAQ) is a tool designed to supervise physical activities among adults (ages 15-69 years) and could be used as a general instrument to collect the data that may be compared between countries on health related physical activities (5). The long term effects of estrogen loss include osteoporosis, myocardial infarction, increased cholesterol levels, obesity and disorders of carbohydrate metabolism, consequently women are faced with the risk of many chronic diseases that threaten during her life, which one study reports as follows: 46% with coronary heart disease, 20% with stroke, 15% with hip fractures, 10% with breast cancer and 2.6% with endometrial cancer (6). Potential chronic disease will increase when women are not prepared to understand the changes that will affect them. Morbidity and mortality chronic diseases in menopausal women have been reported to be related to the pathophysiology of the disease which is based on low estrogen and progesterone levels.

Estrogen deficiency may cause loss of bone mass. Osteoporosis is a disease of fragile bones at age 50 years or older and is characterized by reduced bone density. In women the process of bone shrinkage is greater than men, as bone integrity is greatly influenced by estrogen. This happens 3% annually and will continue until the 5-10 years after menopause. Throughout the life of a woman, a total of 40-50% bone tissue shrinkage occurs, compared to only 20-30% in men (7).

Screening using instrument *Osteoporosis Self Assessment Tool* (OST, OSTA) can clinically detect the risk of osteoporosis in Asian countries. A study conducted to assess the association between estradiol serum levels with the risk of Osteoporosis (OSTA) showed that estradiol serum levels were positively correlated with the risk of osteoporosis OSTA (8). A joint study with the Osteoporosis Society of Indonesia in 2009, reported that the proportion of patients with Osteoporosis in the population were averagedly aged above 50 years old, with 32.3% of them were women (9).

The tendency to reluctantly do physical activities and lack of consuming foods are high in calcium to maintain bone density is the leading cause of high occurrences

of osteoporosis. Maintaining bone density can be done with regular physical activity and sports at minimally twice a week. Bone density is affected by non modifiable factors such as genetics (heredity, race and hormones), gender and age, and modifiable factors that include weight, nutrient intake and physical activities (7). The average life expectancy of women is 70.7 years, whereas most women experience menopause at around 51 years, consequently placing menopause as a serious problem due to the complaints above. Postmenopause, the third period in life, maybe considered a stage of unproductivity. Various efforts need to be done in order to live this long period in life with fun (9).

Quality of Life (QOL) is a multidimensional concept that refers to the welfare of the individual. Basic dimensions of quality of life assessment comprises of ten aspects: physical function, role of physical limitation, pain, health in General, vitality, social functions, restrictions on the role of emotions, emotions, mental health satisfaction and sexual function (7). Quality of life is rated from everyday functions of women and may be decreased due to complaints experienced as a result of a estrogen deficiency (11).

Menopausal women are vulnerable to events of hypertension and cardiovascular diseases which is also contributed to estrogen deficiency. This is even more exacerbated by loss of several functions of various organs of the body as a woman ages.

Increase in blood pressure is also influenced by a variety of factors such as lack of physical activity. Studies comparing effects of various intensity sports show that sports with mild to moderate intensity are more effective at lowering blood pressure in the elderly. Results of the study found that performing relatively stable physical activities affects quality of life and can relieve menopausal symptoms (hot flushes). Overweight women are more likely to experience a decrease in quality of life as higher body mass indexes (BMI) have shown to be correlated higher scores of menopausal symptoms (12). An increase in body mass index (BMI) is associated with a decrease in health obesity related chronic diseases and changes in blood pressure. Kim et al. (2013) showed that perimenopausal women in Korea who perform moderate physical activity significantly suffered lesser psychological and physical complaints symptoms than women with low physical activity (13). The study showed that physical activity was had a significant positive correlation with psychological and social domains in quality of life. In addition, physical activities was significantly associated with lesser somatic complaints that included sexual problems, vaginal dryness, and joint and muscle pain (14).

A study on various literature showed the use of another health promotion intervention in premenopausal women. The results showed identified various complaints

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that have been experienced in the period of perimenopause and menopause. Several studies have outlined various alternatives to reduce these complaints, however these promotive efforts for the have been considered less effective. Currently, preventive efforts should be a priority to prepare a woman to live a healthy and sufficient life during perimenopause, as stated in the health legislation number 36/2009, that health is defined as a state of good health, physically, mentally, spiritually or socially which allows everyone to live a socially and economically productive life (15). This study also incorporates bone strength training, muscle and joints health. Exercise program for healthy bone itself was first put forth by the Seguin (1998) (16) on a group of women aged 58-75 years.

Until now, no promotive effort has been performed to prevent and address the various complaints and risk factors above to prevent long-term impact of estrogen deficiency.

Therefore, this study was performed to assess the effect of the Premenopausal Empowerment Model (PEM) on changes in levels of physical activities.

As for the formulation of the problem in this research: is there an influence of "Premenopause Empowerment Model" to changes the level of physical activity in controlling complaints of perimenopausal women in Pematangsiantar City, Indonesia.

Material and methods

The quasi experimental designed study employed two groups: the pretest-posttest and control group (6) and was conducted at two subdistricts: Kahean, for the control group, and Tomuan, for the intervention group. The study was carried out for 3 months, with 3 times of intervention, from November 2016 to January 2017.

The population in this study was premenopausal woman aged 40-45 living in the city of Pematangsiantar. Sampling was performed using technical purposive sampling based inclusion and exclusion criteria.

After calculation, a sample size of 30 women were obtained for each group, however, to avoid drop outs or lost follow ups, the samples size was increased to 35 women for each group, intervention and control group.

The instrument used to collect of data in this study was the Questionnaire for Health Belief, which comprised of 26 questions, and the IPAQ questionnaire.

The exercises used in this study were as follows:

Exercises to maintain muscle strength and bone

I. Warm-up Movements

The movement for warming up is carried out prior to making the core movement with a duration of approximately 5 minutes. The main objective of this mo-

vement is to loosen and stretch the body. Try to stretch all the body parts slowly starting from head, hands, feet, and the waist. Do jumping jacks are useful for heating body systems. Squats will warm the feet and make it ready for the exercise. Several warming movements before the exercise are useful to prevent muscles from stressing.

II. Core Movement (Sinaki et al. 2002) (17)

1. Crouching with the feet widened

Objectives:

- to strengthen muscles of the hips, thighs, and buttocks
- to improve body balance and awareness

Steps:

- 1) Stands with both feet slightly outward with both legs spread wider than the width of the pelvis in front of a sturdy chair. Stand back onto the seat and fold both hands in front of chest.
- 2) Look straight forward with shoulders relaxed and a well built chest. Count up to three, slowly bending the pelvis and knees to the lower buttocks in the direction of the chair, stop before taking a sitting position.
- 3) Breathe normally.
- 4) Lower and lift the body of the chair by keeping weight focused and push through the heel.
- 5) Stop, then count until 3, slowly, build up to a standing position.
- 6) Repeat 10 times, pausing 1 minute before each set.

2. Forward

Objectives:

- to strengthen the whole feet, calves, thighs and buttocks.
- to improve body balance and awareness.
- to helps prevent falls and possible broken bones.

Steps:

- 1) Stands with the left hip with a distance of a few centimeters from the edge of the table and hands casually resting on the surface of the table. A relaxing shoulder and chest strapping is performed to maintain good posture.
- 2) Take a large step forward with right foot, count until three, slowly bend both knees so that the right thigh is parallel, with the floor and the left foot is approaching but not touching the floor. The right knee does not exceed the fingertips of the right foot.
- 3) Breathe normally.
- 4) Keep your upper body upright. Stop, and then count to 3 slowly sliding from the right heel to a stading position and bring the right foot back in order to meet with the other foot.
- 5) Make sure on returning to the original position, push body back and above.

- 6) Do as much as 2 sets with 10 repetitions of stepping forward with the right foot. Then finish 2 sets with 10 repetitions of moving forward with the left foot.

3. *Lift the foot from the side*

Objectives:

- to train pelvic bone and muscles.
- to improve agility and strengthen the outer thigh muscles.

Steps:

- 1) Stand on the left side with a distance of a few centimetres from the edge of the table and hands casually resting on the surface of the table. Shoulders relaxed and chest strapping to maintain good posture.
- 2) To keep balanced until the 3rd count, keep your upper leg straight, slowly raise your feet away from the floor to a height of 15-50 cm. when lifting, let the heel of the foot lead.
- 3) Breathe normally.
- 4) Stops then count to three and then lower the leg back to its original position.
- 5) Do 2 sets of 10 repetitions of lifting distance with the right leg, resting 1 minute between each set. Repeat with the left leg.

4. *Fly play one hand*

Objectives:

- to strengthen the muscles of the upper back and shoulders.
- to helps maintain good posture and reduce stress on your spine.

Steps:

- 1) Stand with left sided \pm 60 cm from a sturdy desk with legs and shoulders wide apart. Bend hip joint forward, rest your left hand on the table to the balance position.
- 2) With dumbbell in your right hand, slowly raise your hands directly to the side on the third count, keep your elbows still and relaxed with the palm of the hand facing down.
- 3) Breathe normally.
- 4) Keep knees and elbows limp throughout the exercise.
- 5) Make sure that the wrist, arm, head, neck and back are in one line and the shoulder is slouched.
- 6) Stop, then on the third count, lower the hands back to its original position.
- 7) Do 2 sets of 10 repetitions on the right hand with a 1 minute rest in between sets. Then repeat on the left hand.

5. *Push Up*

Objectives:

- to strengthen the wrists, chest and shoulders.
- to strengthen awareness and balance the body.

Steps:

- 1) Lay face down on the carpeted floors with hand snugged beside the shoulders, fingers facing forward and elbows bent and pointed to the top.
- 2) Keep the knees and legs relaxed, slowly push the shoulders, chest, the pelvis and thigh away from the floor o the third count, and the breathe regularly.
- 3) Keep your stomach muscles contracted and make sure the thighs, buttocks, back, head and neck remains in a straight line through out the exercise.
- 4) Put a towel under the knee pleated for extra pads when needed.
- 5) Stop, then to count to three, slowly lowering your body back down until floating slightly above its original position.
- 6) Do 2 sets of 10 repetitions a 1 minute rest between sets.

6. *Stretch your back*

Objectives:

- to strengthen muscles of small spina erektor residing along the spine.
- to prevent back pain and improve posture of the vertebrae (the bones that are prone to osteoporosis).

Steps:

- 1) Lie face down on a carpeted floor with left hands played straight above the head and parallel to the floor and hands beside the body. Keep the view on the floor and the head and neck in one line, slowly raise your left hand and legs from the floor on the third count, breathe as usual.
- 2) Keep the view on the floor and the head and neck in one line, slowly raise your left hand and legs from the floor on the third count, breathe as usual.
- 3) Keep hands raised beside the ear.
- 4) Put a pillow under the knees to pad.
- 5) Stop, then count to three, slowly lowering the hand and foot back to the floor, do 2 sets of 10 repetitions.

7. *Sit ups/belly roll*

Objectives:

- to strengthen your stomach muscles, shrink the abdomen and repair the strength and stability of the governing body.

Steps:

- 1) Lie down on your back, on the exercise floor mat or carpet with both knees bent and feet flat on the floor. Put your hand on the back of the head and neck for support and keep your view to the top of the ceiling.
- 2) On the count of three, slowly raise your head, neck, shoulders and back from the floor, with the abdominal muscles contracting.
- 3) Breathe normally.
- 4) To reduce the strain on your back, keep your head and neck in one line, make sure to keep your gaze

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- upward and lift up the chest toward the ceiling.
- 5) Stops, then on the third count, slowly lower the body.
- 6) Make several movements, while putting one hand on your stomach muscles and feel the contractions, remember to move slowly and centre the abdominal pad to lift the body off the floor.
- 7) Do 2 sets of 10 repetitions.

III. Movement of cooling

Cooling down after exercise will be useful to speed up the recovery so that the risk of weariness and fatigue will be minimized. This movement is performed for more or less 10 minutes.

Study flowchart and stages of intervention (Figure 1) (Table 1).

Results

Homogeneity of the subjects involved are displayed in Table 2.

Health Belief Women' Premenopause.

Frequency distribution of increased average score variable health belief can be seen in Table 3.

TABLE 1 - STAGES OF INTERVENTION.

Stage	Description
I	Explain a woman's reproductive life cycle.
II	The issue of reproductive health in the period of perimenopause.
III	Potential health problems associated to estrogen deficiency that threaten life survival.
IV	The pattern of healthy living with regular physical activities/exercises in an effort to reduce complaints and alternative prevention efforts to adress the short term effects of estrogen deficiency.

The table above shows the increase in the change score health belief one very stage of the intervention is done, start the first intervention score health belief 59.74 to post the 3rd with a score of 76.89.

The level of physical activity of women's premenopause (Tables 4, 5, 6, 7).

Frequency distribution of variable changes the category of physical activity during given the treatment can be seen in Table 4 below, and the test of normality in Table 5:

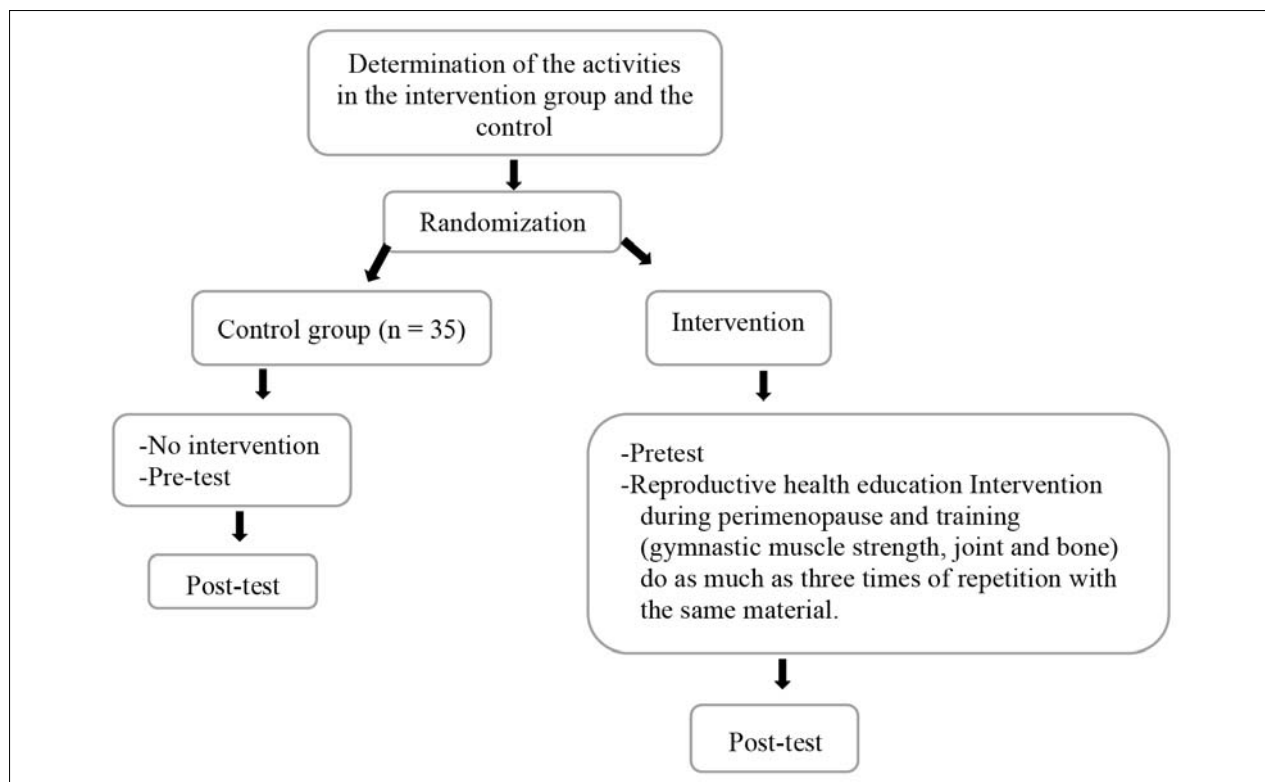


Figure 1 - Study flowchart.

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TABLE 2 - TEST OF HOMOGENEITY RESPONDENTS IN THE INTERVENTION AND CONTROL GROUPS WOMEN'S PREMENOPAUSE IN PEMATANGSIANTARCITY 2016-2017.

Characteristic	Intervention		Control		p*
	n (35)	%	n (35)	%	
Age					
40-42	21	60,0	26	74,3	0,262
43-45	14	40,0	9	25,7	
Education					
Low	9	25,7	4	11,4	1,000
High	26	74,3	31	88,6	
Occupation					
Unemployed	14	40,0	17	48,6	0,129
Employed	21	60,0	18	51,4	
Menstruation Cycle					
Normal	21	60,0	23	65,7	1,000
Abnormal	14	40,0	12	34,3	
Married Aged					
≤ 20	2	5,7	3	8,6	1,000
> 20 t	33	94,3	32	91,4	
Paritas					
≤ 2	10	28,6	15	42,9	0,458
> 2	25	71,4	20	57,1	
IMT					
Normal	18	51,4	19	54,3	0,919
Fat	11	31,4	8	22,9	
Obesitas	6	17,1	8	26,6	

p*: Chi Square

TABLE 3 - FREQUENCY DISTRIBUTION THE CHANGED SCORE MEAN HEALTH BELIEF IN THE INTERVENTION GROUP WOMEN'S PREMENOPAUSE.

Health Belief	Intervention I	Intervention II	Intervention III
Pre-test	59,74	66,71	72,2
Post-test	64,40	70,57	76,89

TABLE 4 - FREQUENCY DISTRIBUTION OF PHYSICAL ACTIVITY OF WOMEN'S PREMENOPAUSE.

Physical Activity	Pre-test		Post-test	
	n (35)	%	n (35)	%
Intervention I				
High	12	34,3	17	48,6
Low	23	65,7	18	51,4
Intervention II				
High	16	45,7	20	57,1
Low	19	54,3	15	42,9
Intervention III				
High	18	51,4	24	68,6
Low	17	48,6	11	31,4

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TABLE 5 - TEST OF NORMALITY.

Variable	p-Value	p*	Status
Health Belief			
- Pre Intervention	0,103	p>0,05	Normal
- Post Intervention	0,110		
Internal Locus of Control			
- Pre Intervention	0,167	p>0,05	Normal
- Post Intervention	0,134		
Physical Activity			
- Pre Intervention	0,081	p>0,05	Normal
- Post Intervention	0,079		

TABLE 6 - THE DIFFERENCE IN THE INCREASE IN CATEGORY VARIABLE HEALTH BELIEF, PHYSICAL ACTIVITY AFTER THE IMPLEMENTATION OF PEM IN THE INTERVENTION GROUP AND CONTROL WOMEN PREMENOPAUSE IN PEMATANGSIANTAR CITY 2016-2017.

Group	Variable/Category	Pre-test		Post-test		d	p*
		n (35)	%	n (35)	%		
Intervention	Health Belief						
	High	9	25,7	24	66,6	15	<0,001
Control	Low	26	74,3	11	31,4	-15	
	High	5	14,3	11	31,4	6	0,070
	Low	30	85,7	24	68,6	-6	
	Physical Activity						
Intervention	High	12	34,3	24	68,6	12	<0,001
	Low	23	65,7	11	31,4	-12	
Control	High	10	28,6	16	45,7	6	0,070
	Low	25	71,4	19	54,3	-6	

TABLE 7 - THE DIFFERENCE IN THE INCREASE OF THE MEAN SCORE HEALTH BELIEF, PHYSICAL ACTIVITY. THE INTERVENTION GROUP AND THE CONTROL OF WOMEN'S PREMENOPAUSE IN PEMATANGSIANTAR CITY 2016-2017.

Variable/Group	Mean		Mean Difference	SD	p*	T- Dependent Test
	Pre-test	Post-test				
Health Belief						
Intervention	59,74	76,89	17,15	9,958	< 0,001	10,186
Control	54,23	54,94	0,71	2,865	0,149	1,475
Physical Activity						
Intervention	0,66	0,31	0,35	0,482	<0,001	2,758
Control	0,71	0,54	0,171	0,454	0,072	2,240

The influence of the PEM (Premenopause Empowerment Model) against Health Belief

Change the perception on the components of the health belief after the application of the PEM using the pocket book, shows that there is a difference the components of the health belief before and after interventions on groups the intervention significantly, where the value of $p = <0.001$. This is in line with research conducted by Tehrani et al. (2014), which examines the influence education based on health belief against the beliefs of health women with infection of trac-

tus urinary, research was done to 170 married women with urinary tract infection in Teheran. The results showed that the experimental group showed an increase in the significantly to vulnerability, severity, benefits and barriers felt after given intervention (education based on health belief model) (18).

Education based on health belief model has a significant impact on prevention behaviour against osteoporosis the mother and daughter. This research was done to the girls whose mother suffers from osteoporosis and girls whose mothers do not suffering from

osteoporosis. Primary prevention of osteoporosis program, that includes health education and promotion programs should be emphasized, with the aim of optimizing the growth of bone mass, prevent bone damage at a later date. Recommended educational programs should be designed as an effective method to conduct prevention of osteoporosis (19).

Health Belief Model (HBM) is often considered main frame in behavior associated with human health and has prompted health behaviour research since the 1950s (20). This makes the HBM as model that explains the reasoning of someone before they behave healthy. Therefore, the HBM has a function as a model of preventative or preventive (21). HBM is a cognitive model which means that individual behavior is influenced cognitive processes in himself. The cognitive process is influenced by several factors such as expressed by earlier researchers such as demographic variables, characteristics and structural variables, socio-psychological (such as the knowledge and experience of the problems will be encountered).

Champion and Skinner (2008), the Health Belief Model has four major components such as the individual's perception about the vulnerability is exposed to a disease (perceived susceptibility). Vulnerability refers to the belief about the possibility of a person to be exposed to the disease. This model predict that women premenopause more likely to comply with the healthy lifestyle changes if their long-term impact on the vulnerable the length of the lack or loss of estrogen in the body. The perception of the seriousness of (perceived severity), this refers to the feeling of being a premenopausal woman in judging how serious the condition is a health problem that will occur and the consequences brought about by health problems when left not prevented or treated. The perception of benefits perceived occurs when someone feel the susceptibility for the conditions serious health, and such perceptions lead to changes, the behavior will be influenced by a person's beliefs about the perceived benefits of various precautionary measures. The perceived barriers of perception refers to the negative aspects and contrary to do a precautionary measure (22).

The perception of individuals against vulnerability and severity of a disease generate perceptions against how big a threat the disease occurs against him. Consideration of the benefit of behavior expected and consideration of the surrounding environment will be consideration in approving the expected behaviour or not, until finally deciding to behave is expected (cues to action) because of the sign or symptom that is experienced by yourself or others; the existence of information, either from the media or from the maid's health; support from the family. Champion et al. 2008, health belief model used to predict the behavior of preventative health and

also response the behavior for the treatment of patients with acute and chronic illnesses as well as explain the relationship between behavioral health (19). Health Belief Model is a model that specifies how the individual cognitively healthy as well as behaviour indicates efforts to towards a healthy or healing a disease based on belief or belief of individuals about healthy behavior as well as treatment make certain the individual is healthy or cured.

Bayat et al. (2013) did a study done against 120 patients with type II diabetes is randomly chosen at the University Hospital Tehran. Provide health education intervention-based Health Belief Model for 3 months and 6 months. The education program has an impact positive on health including the perceived vulnerability, or the perceived intensity of seriousness, the perceived benefits, barriers that perceived self-efficacy and group experiments. Education is an important factor influencing health so that individual belief (23). The results of the research done to see the relationship between knowledge osteoporosis, calcium intake and health belief on college students. This study also examine the perceived susceptibility, severity, benefits, barriers and self-efficacy with regard to the prevention of osteoporosis. The results of the Research shows that individuals will take action prevention when knowing that osteoporosis vulnerable going on him. Lack of knowledge will cause individuals to feel not vulnerable against interference (24).

The perception of the individual in doing or choose a healthy behavior, specify an attitude of Yes or no do health behavior can be examined in Health Belief Model (25). The results of this research show the influence of intervention of PEM to change the components of the HBM showed significant results so that health education is a factor that affects the health of a person's belief. Factors health belief-based cognitive and deals with the process of thought involved in individual decision-making in decide how to live a healthy life.

Reproductive health information on perimenopause period provided through interventions PEM was able to change health belief premenopause, so that women can show a change in attitude to be independent in conducting prevention efforts. Health Belief that high through the application of intervention relates to the level of the country's self-reliance in this research. The level of independence of women in premenopause control of the complaints in the period of perimenopause indicates that

the individual cognitively healthy as well as behaviour indicates efforts to towards healthy based on belief or beliefs.

The influence of the PEM (Premenopause Empowerment Model) of physical activity. Physical acti-

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vity is doing the movement of the limb cause the spending power that is essential for the maintenance of physical, mental health, and sustain the quality of life in order to stay healthy and fit all day long. The type of physical activity that are expressed in the IPAQ (2005) (5):

- 1) Physical activity related to work outside the home.
- 2) Physical activity relating to the transport (physical activity pleased with the way of traveling from one place to another with the use of this type of vehicles such as bicycles, four wheels).
- 3) Physical activity related to housework, home care and care for the family.
- 4) Physical activity conducted for recreation, sports and do gymnastics on leisure
- 5) Activity that used to sit at home, in the workplace, visiting friends, reading or watching television lying down.

Regular physical activity has a beneficial effect against Health: avoid heart disease, stroke, osteoporosis, cancer, high blood pressure, diabetes, and others: weight loss under control; Muscles are more pliable and stronger bones; The shape of the body become ideal and proportional; More confident; More energetic and fit; Overall state of health for the better (26). Increased physical activity provide benefits for the body because it can lowering blood pressure, maintain weight, improve strength the body and improves blood glucose control. Increased physical activity like sports, will increase the sensitivity of the insulin hormone, so the more controlled blood glucose.

There is an increased physical activity category, after the intervention of PEM with a value of $p = <0.001$ and there is a difference increased variable rate category physical activity on measuring pre-test and post-test on a group the intervention significantly where the value $p = < 0.001$.

Intervention of PEM include information about physical activity and exercise gymnastics muscle strength and bone. A demonstration of this exercise conducted by the instructor gymnastics as much as the intervention progresses. Premenopause women are given information about the importance of exercise, the benefits for the body and something to do with maintaining health, muscle strength and bone in osteoporosis prevention efforts that could potentially occur in women menopause. Women's premenopause were also given pieces of compact disk (CD) the shows how to exercise, the benefits of each of the movements to be performed, the position of the right moves and stage movement ranging from warming, core movements and the cooling recorded on CD. Exercise movement that is present in the CD pieces belong to the respondent and expected to guide the right moves when it is done in a independently at home. This activity was also assessed every 2 weeks after intervention done with home

visits and assess activity diary his physical for the intervention done.

On the research group's treatment of running physical activity with running exercises and sports with the help the CD provided. Classified treatment group had moderate activity when it is do the gymnastics exercises at least 3 times a week with the duration of each exercise at least 30 minutes. As expressed by Zanesco, et al. (2009), the duration of the workout with medium intensity physical activity to high intensity, for three days a week can increase blood pressure and useful hormone in training weight loss program (27).

During the time of the animation is done by as much as 3 times the women's mentoring, premenopause gradually starts to realize the importance of exercise gymnastics performed coupled with the existence of removable media guide them do exercises. Some respondents suggested that movement training easy to remember and easy to follow and even was able to memorize his movement. The ease with the media granted, making the respondent need not be out of the House or looking for Gymnastics Studio for the sake of maintaining the health of the body. Even gymnastics exercises: this can be done with some member of your family and neighbours. This fact has shown that respondents already serves as as supporters in the family and their neighbours. This shows that the community empowerment have started to arise.

Sinaki et al. (2002), do research on a group of women (58-75 years) and give movement exercise for healthy bones in order to maintain the strength of the bones muscles and joints, this exercise was conducted for two years against the control group and the intervention. At the end of 2 years female who had done strength training has a stronger back muscles but did not find any difference between the two groups in the density of the bone. Eight years later, the research group evaluating the density of bones and obtained the results of the laboratory group interventions still has the power of a stronger back muscles and better bone density when compared to the control group (17). The core movement practice that once used to assess bone strength muscles and joints, adapted into a movement to keep the strength exercises muscles and bones in women premenopause in this study. The results of the research, Sinaki et al. (2002), the definitive exercise was successfully conducted in the strengthen back muscles and maintain bone density in the age of 58-78 years and researchers suspect this will get the same results on a target that has a younger age.

Febi (2005), audio visual media influence is most closely related to the behavior of a propaganda. Audio visual media can lead to some changes, such as changes in behaviour, increase knowledge, affect the stage survive, strengthen values, influences the psycho-

logical perspective. Listeners to construct to form their own views about the social reality in place they interact with the media offered (28). Febi, (2004) and Mahfoedz (2005), more visual tools simplify the way of delivery and receipt of information or educational materials and the results of research conducted on Rambo (2004) shows that an increase in post-test the average teacher's knowledge of physical and health education about GAKI (Iodine deficiency disorders) in the intervention group through assisted lectures VCD and leaflet compared a group that just got a promotion through speaking engagements helped media VCD (29).

Some research suggests that with physical activity the routine performed with the duration of 30 minutes each exercise is very beneficial in the complaint, perimenopause reduce Kim (2014), examine the relationship between physical activity and menopausal symptoms in women in perimenopause Korea, multiple linear regression analysis showed that women perimenopause who do moderate physical activity turned out to be very significant in addressing the problem of psychosocial and physical symptoms compared to women who did the physical activity is low.

Research conducted by 2013 JavadiVala, about the relationship of activity the physical and the intensity and duration of the symptoms of menopause, the obtained results show that there is a relationship between physical activity and the four domains of quality of life the woman, who was assessed with the Health Related Quality Of Life (HRQOL), there is a relationship between physical activity and chronic disease. Regular physical activity will be effective in reducing the symptoms of menopause as well as increase health in old age, needs to be improved promotion of physical activity as part of the promotion of a healthy lifestyle in a society where women are not physically active after aging. In addition, women need to be told about the importance of physical activity in the pre and post menopause in order to achieve a healthy life in the elderly (14).

Moderate intensity physical activity for thirty to sixty minutes per day is sufficient to maintain a normal weight. Although no overall physical activity can prevent the increased weight due to age, but it can protect the onset of obesity (24). Mansikkamäki et al. study, examine the relationship between physical activity recommended with the quality of life among middle women. The results showed that the physical and psychological aspects (depression, somatic disorders, the level of concentration and memory, vasomotor complaints) better found in women who have a physical activity high when compared with inactive women. Physically active women indicates a higher quality of life compared with women inactive (30).

Tan, (2014), the results of research to know the influence of physical activity against the symptoms of menopause in menopausal women in Turkey, showed that women who were physically active had a menopausal complaints lower as symptoms of somato-vegetative, psychological and urogenital compared to women who are less active. There is a difference in level of menopausal complaints, including sleep disorders and sexual problems, joint and muscle discomfort and dryness of the vagina on the physical activity levels of high and low (high physical activity had a low level of complaints) (31).

Various research results above indicate that the important and beneficial of doing regular physical activity in daily life. Department of health, 2006, recommends that regular physical activity and progress with duration 30 minutes every day or at least three times a week bring good benefits in body fitness 23 physical activity. It turns out that routine can reduce complaints of perimenopause. Need informed that physical activity is also part of the body needs the necessary and required if you want to keep health especially bone health. The intervention group was given empowerment has been able to change his daily physical activity by adding movement to exercise maintaining muscle strength and bone. Pre-test results I in the intervention group show as many as 23 people have low physical activity are the rest have high physical activity and the results of the interview done there are only 4 people doing sport with 30-60 minutes duration each movement.

Accompaniment and repeated interventions have been able to change her life the Group intervene, visible from the judgment obtained, every month. There is an increase in the category of physical activity toward higher with exercise muscle strength and bone that has been socialized, although not yet changed overall. Even these activities carried out by the group intervention by referring as well as family members and their neighbours in the carry out the exercises at home. Premenopause women who have yet to fall into the category of high physical activity assessed just do the exercise movements of muscle strength and bone just 2 times in a week.

The tendency of physical activity, do reluctantly and lack of consumption foods that are high in calcium is a risk factor for the occurrence of porous bones. Apart from the sport it is desperately needed nutritional intake sufficient: when this is not balanced will cause an increase in process osteoporosis so the bones will break easily. Osteoporosis in the short term: pain is manifested in form on the bone joints. Osteoporosis that occur in the long run will cause the onset of Osteoporosis in menopausal women (32). Considering the shortcomings and even loss of the hormone estrogen in the

The impact of premenopausal empowerment model based health belief model to changes in physical activity levels in controlling complaints of perimenopausal women in Pematangsiantar City, Indonesia, 2017

body in long periods of potentially affected by osteoporosis, a degenerative disorder that is characterized by mass loss due to an imbalance between resorpsi bones and bone formation. This disorder can occur due to the aging process and the decrease in the function of the gonads (33). Maintaining the balance of bone remodeling in women, the hormone estrogen is known as an influential agent. Estrogen is known as anti resorptif agent which works primarily by inhibiting bone resorption by the osteoclasts. The antiresorptif effect can be generated through his work on osteoblast which indirectly affects the activity of the osteoklastik. Proven estrogen supplementation can reduce the rate of decrease in bone mass and fracture risk in women with osteoporosis (34, 35). International Osteoporosis Foundation (IOF) revealed that 1 in 4 women in Indonesia with a range 50-80 years of age had a risk of developing osteoporosis and the risk of 4 times more high than men (32).

Physical activity (exercise) can build bone and muscle to be more strong, also increases balance metabolism. The formation of mass the bones were heavily influenced one's physical activity. Physical activity associated with an increase in spinal bone density help the physiological and biochemical processes, for the mineralized bone needed calcium. Calcium is the mineral most in the body that is less than 1000 grams. Calcium is required to maximize the peak bone mass and maintain normal bone density (36).

Sports activities is important, osteoporosis is the process of degeneration in the bones. Those who have been exposed to need sports or physical activities as part of the treatment. On the research that has been done it is evident that certain sports exercises can not only help us protect yourself against reduced bone density due to increasing age, but can also be increasing the density of the bone period on certain areas. On this research introduced a bone and muscle strength exercise useful keep muscle strength back and bone density. This exercise expected to be an effort to protect the bones and muscles premenopause women against the incidence of osteoporosis as a result of losing the hormone estrogen. This exercise is designed to be performed during the period of premenopause (ages 40-45 years) in research and great expectations in the coming two years to be an evaluation of the strength of the back muscles and bone density. Previous research test try this exercise on a woman who had aged 58-75 years, and the results obtained after 2 years, it was found strong back muscles and bone density in the group interventions (17). The main benefits the whole exercise on top of keeping the body balance in order to avoid a fall can lead to injuries or fractures in addition to maintain muscle strength and backbone, the pelvis and thighs. The incidence of broken bones that often experienced by men and women due to osteoporosis is fracture of the up-

per thighs that can lead to lifelong disability. Data from the system information home pain (SIRS, 2010) in the Kemenkes RI. 2015, the incidence of fractures due to osteoporosis over there of 200 cases of 100,000 at age of 40 (32).

Strength training of the muscles and bones that are trained in group treatment aiming to maintain muscle strength and backbone, pelvis and thighs as early as possible, when the exercise was conceived, Senguin, et.al,1998, means for maintaining muscle strength and bone density of women in the age of 58-75 years, likely this exercise will also produce a meaningful impact 2-5 years into the future. Researchers modify this exercise with the help of gymnastics instructor of UNIMED by adding motion heating and cooling is accompanied by a description of the movements every phases of its recorded in pieces of the CD to be owned by women premenopause. The purpose of the giving of the pieces of the CD expected to help women premenopause in doing the motions independently in the home every day or at least done 3 times a week with the duration of 30 minutes.

Conclusion

1. There is a difference in health belief premenopause women before and after application of the Premenopause Empowerment Model (PEM) on treatment group and the control group. Change score health belief high on the group's treatment is greater (9.96 ± 17.15) with $p < 0.001$ than the control group (0.71 ± 2.86) with a value of $p = 0,149$.

2. There is a difference in the physical activity of women before and pramenopause after application of the Premenopause Empowerment Model (PEM) on treatment group and the control group. Change the category of a physical activity high on the Group's treatment is greater (0.35 ± 0.48) with $p < 0.001$ than the control group (0.17 ± 0.45) with a value of $p = 0.07$.

Recommendations:

1. Advanced research can do for empowerment on target women who are under the age of 40, because the sooner the information conveyed is getting early prevention efforts that can be applied.

2. For subsequent research can observe and assess the application of PEM to 2-3 years into the future in assessing complaints experienced on the period of perimenopause.

3. Advanced research can be done by assessing muscle strength the back bone density and to evaluate the benefits of exercise has been done.

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