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**EFFECTIVENESS OF PREGNANCY EXERCISE ON PAIN
REDUCTION AMONG WOMEN IN THE FIRST STAGE OF LABOR**

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ABSTRACT

Background: Every woman who gave birth should feel pain during childbirth. One of the ways to reduce labor pain is non-pharmacological method is through pregnancy exercise. From the observations conducted by researchers in March 2016 obtained from 10 nulliparous laboring women, there are three people experiencing mild pain, five people experiencing moderate pain and two people experiencing severe pain during the progress of delivery.

Aims: This research aimed to know the differences of the mean level of pain during the first stage of labor between women who performed pregnancy exercise and those who did not.

Methods: The design of this research was quasi-experiment. This research conducted in midwife practice Yenni Fitri in Bukittinggi Padang-West Sumatera between March to August 2016. A total of 16 pregnant women and joined the class of pregnant women was selected using purposive sampling method and be asked to fill observation sheet.

Results: The result showed that there was a significant different in labor pain during the first stage of labor (p value < 0.001). The mean pain level among pregnant women who participated to pregnancy exercise was 4.03, lower than the control group (6.25).

Conclusion: Exercise during the third trimester of pregnancy was the good way to the mother to adapt the pain during delivering baby. Pregnant women can do routine pregnancy exercise from the first trimester of pregnancy. This research is expected to recommend health service providers, especially midwives, to deliver the information and the advantages of pregnancy exercise to the women, and to facilitate exercises on third grade pregnant women since exercise during pregnancy is effective and cost-effective in reducing pain and discomfort during the first stage of labor if done regularly.

Keywords: Exercise, labor pain, pregnancy.

INTRODUCTION

Childbirth is a physiological process that should be experienced by every pregnant woman and it is currently highly waited by pregnant women to be able to feel the happiness to see and hug her baby. But childbirth is also accompanied by pain that makes happiness coveted and overwhelmed by fear and anxiety. Childbirth started from the uterus to contract and cause changes in the cervix (opening and thinning) and ends with the birth of the placenta is complete [1].

Pain during childbirth causes psychological changes, including increased anxiety accompanied by crying, hand gestures (which signifies pain) and muscle tension throughout the body. The pain experienced during childbirth is very subjective for every woman. Childbirth pain is personal, every people perceive pain differently on each of the same stimulus depends on its pain threshold. Pain during childbirth is a manifestation of contraction (shortening) muscle of the

uterus. Most mothers consider childbirth pain as something dangerous and frightening experience [2].

Some of the factors that cause pain in Childbirth is reduced supply of oxygen to the muscles of the uterus (childbirth pain becomes more severe if the interval between contractions is short, so that the supply of oxygen to the muscles of the uterus has not fully recovered), stretched the cervix (effacement and dilation), Fear and anxiety can cause the release of stress hormones in large quantities (epinephrine, norepinephrine, and others) that resulted in the emergence of labor pain were longer and heavier. Pain and stress during delivery activate sympathetic nervous system, resulting in increased concentrations of catecholamine so that it can contribute to prolonged childbirth (prolonged second stage) so that it can increase the risk of caesarean deliveries [3].

One effort to reduce Childbirth pain Non-pharmacological are exercises during pregnancy. These exercises can produce a natural analgesic effect on the body to reduce aches and pains [4]. Pregnancy exercise was first introduced on the results of the obstetrician named by dr. Gratley Dick Read, research reveals that every woman should be prepared mentally and physically to face the delivery process [5]. There are three components in exercises during pregnancy, i.e, breathing exercises, strengthening and stretching the muscles of the pelvic and relaxation exercises [6].

Pregnant gymnastic exercises should be started in three trimesters of pregnancy around 28-36 weeks of gestation to flex the muscles of the pelvic floor, breathing exercises before the delivery process is done so that the mother can manage pain in the face of labor pain that mothers can feel calmer and supply oxygen throughout the body running smoothly, relaxation exercises during training exercises is also important so that the mother can manage the pain so as to reduce tension and anxiety during labor so that can reduce childbirth pain [7].

Mothers who regularly undergo exercises during the third trimester of pregnancy will experience the birth process easier, smoother and shorter duration of childbirth. Based on the result of research about correlation between pregnancy exercise and the duration of the second stage of Primigravida in pregnant woman at Sadewa Mother and Child Hospital using survey analytical method, most respondents, or 43 people (68.3%) did pregnancy exercise regularly and 42 people (66,7%) experienced normal childbirth during the second stage. And there is a correlation between pregnancy exercise and the duration process of childbirth of the second stage of labor in primiparous mother [8].

Another factor that can affect the intensity of childbirth pain is age of younger mothers have sensory pain is more intense compared with mothers who have an older age. Younger age tend to be associated with psychological conditions are still unstable triggering anxiety so that the pain is felt more and more strongly than in mothers who multiparas and mother multiparas have birth experience before it will be easier to adapt to pain compared with women who had never had any experience in this primiparous mother [9].

Based on preliminary researches that had been done by researchers at Midwife Practice Yenni Fitri Bukittinggi Padang in March 2016, there were 424 birth mothers, where the birth by 190 primiparous people. From observations obtained from 10 primiparous birth mothers, three people experienced mild pain; five people experienced moderate pain and two others suffered severe pain during childbirth. This is indicated by daily exercise and pregnancy exercise. Exercise had been followed by pregnant women that can affect childbirth pain. Based on the description above, he study aimed to know the differences of the mean level of pain during the first stage of labor between women who performed pregnancy exercise and those who did not. This study

conducted in Midwife Practice Yenni Fitri Padang – West Sumatera, 2016. Researchers are interested in knowing the effectiveness of exercise in the third trimester of pregnancy on pain reduction during the first stage of labor in midwife practice Yenni Fitri Padang- Sumatera West London, 2016.

METHODS

This research used a quasi-experimental with Post-test only design with Nonequivalent Groups. Intervention done by giving pregnancy exercise training to the women on their third trimester of pregnancy (28-40 weeks) for 4 times (28, 30, 32, 34 weeks gestation). Then, respondents were monitored until the first stage of the active phase of childbirth (4 cm-10 cm) to assess pain in childbirth.

The population in this research was every woman who registered in the pregnant women class in Midwife practice Yenni Fitri in Bukit tinggi, Padang-West Sumatra from March to August 2016. The technique is non-probability sampling using purposive sampling [10]. Samples were obtained as much as 16 pregnant women were then helped two groups of eight control group and 8 intervention group. Determining the number of samples is using the formula for the calculation of experimental research to a completely randomized design, randomized or factorial [11]. Inclusion criteria for this research were primiparous pregnant women and normal pregnancy. Researchers conducted exclusion in pregnant women multiparous and pregnant women who did not follow the pregnancy exercise regularly.

Collecting data in this research used questionnaire to obtain information neighbour characteristics of respondents. Then, researchers examined the childbirth pain as much as four times in the first stage of childbirth (4 cm, 6cm, 8cm and 10 cm) using a Visual Analog Score (VAS), assessment of pain are grouped into three: mild pain (scale 0-3), moderate pain (scale 4-6), and severe pain (scale 7-10) [13]. Visual Analog Score is widely used in clinical studies to evaluate a subjective symptom to measure the level of pain [12]. Reliability of VAS was reliable enough to be used in assessing the acute pain [13].

RESULTS

Table 1 showed that the group got exercise training, third trimester of pregnancy, it was total 8 respondents and was five respondents (62.5%) were in the mild pain scale, 3 respondents (37.5%) were in moderate pain. This indicates that the scale of pain in the intervention group only at the mild pain and moderate pain, no respondents who were in severe pain scale. While the group that did not do the exercises in the third trimester of pregnancy consisted 8 respondents, there were five respondents (62.5%) who were at moderate pain scale, and as many as three respondents (37.5%) who were in severe pain scale, there were no respondents were on a scale of mild pain. To determine the relationship or effect between the independent and dependent variables suspected of having links with one another. This research used analysis Independent T-Test to determine the effectiveness of exercise pregnancy exercise in third trimester of pregnancy for the reduction of pain during the first stage of childbirth.

Table 1. The frequency distribution of childbirth pain between the intervention group and the control group

Group	Pain						Total	
	Mild		Moderate		Severe		F	%
	F	%	F	%	F	%		
Intervention	5	62,5	3	37,5	0	0	8	50
Control	0	0	5	62,5	3	37,5	8	50
Total	5	31,2	8	50	3	18,8	16	100

Table 2. The difference of mean of pain intensity during first stage of childbirth between Intervention group and control group

Variable	N	Mean	Median	T	SD	Min-Max	SE	95% CI	P value
Intervention	8	4.03	4.00		0.795	3,00-5,25		3,37-4,70	.000
Control	8	6.25	6.37	-5.596	0.790	5,00-7,00	0.279	5,58-6,91	

Table 2. Showed that the mean pain intensity on first stage of childbirth in group that was doing training pregnancy exercise much lower (4.03) with a minimum of pain intensity scale of 3.00 and the maximum is 5.25. While in third trimester of pregnant women that did not do pregnancy exercise, mean of first stage childbirth pain (6.25) with a minimum value of the pain scale of 5.00 and a maximum value of 7.00. Statistical test was using Independent t-test and obtain ρ value (0.000) $< \alpha$ (0.05), this showed that H_0 was rejected and it means that there were significant difference on the mean level of pain during the first stage of labor between women who performed pregnancy exercise and those who did not. The differences were the intervention group had lower the mean level of pain compared with control group.

Based on the result with the Confident Interval 95% believed that pregnancy exercise in third trimester of pregnancy will reduce pain during giving birth first stage between 3.37 to 4.70. Statistical test using independent t-tests obtained ρ value (0.000) $< \alpha$ (0.05) means that there were significant difference on the mean level of pain between pregnant women who did performed pregnancy exercise and those who did not.

DISCUSSION

Table 1 showed 8 (50%) respondents that pregnant women who had pregnancy exercise experiencing mild childbirth pain as much (62.5%), moderate pain (37.5%) and no pregnant women who experienced severe pain (0%). It is different in women who did not do the exercise during pregnancy 8 (50%) respondents were experiencing moderate pain (62.5%), severe pain (37.5%) and there was no pregnant women who experienced mild pain. Mothers who during pregnancy routinely conduct exercises during pregnancy third trimester only suffered mild pain and moderate during the first stage of labor because at the time of exercises, pregnant women doing physical movements that aim to flex the muscles of the pelvic floor, the abdominal wall and buttocks so ready to accept the pressure of the baby's head. Then, pregnant women are also taught during the exercises how to take a good breath and how to manage fear and anxiety in the face of labor by doing miraculous relaxation techniques that labor pain can be reduced. While pregnant women who do not exercise pregnancy exercise in pregnancy third trimester, experienced moderate pain and severe as the muscles of the pelvic floor, abdomen and buttocks are not trained to flex / stretch the muscles so that it is not ready to accept the pressure of the fetal head so that the

pain natural mothers tend to be heavier what more if followed by fear and anxiety in the face of childbirth process [14].

Research result in Table 2 indicates that the average pain intensity in a group doing exercises in third trimester of pregnancy lower (4.03) with minimum pain (3.00) and maximum (5.25), compared with the average pain in the group that did not exercise gymnastics in the third trimester of pregnancy (6.25) with the minimum pain (5.00) and maximum value (7.00), then p value (0.000) $< \alpha$ (0.05), it shows that there are significant differences in mean pain and the intervention group control. So it can be stated that women who performed pregnancy exercise had lower mean pain level than women who did not perform pregnancy exercise. Statistic test showed that there were significant differences the mean pain level between women who performed pregnancy exercise and those who did not. Pregnancy exercise has good effect on mean pain level during the first stage of labor among women with pregnancy exercise compare women who didn't.

So it can be stated that pregnancy exercise is effective in the third trimester of pregnancy effectively decrease pain during first stage of childbirth.

Labor pain is caused by several factors, the reduced supply of oxygen to the muscles of the uterus, the stretching of the pelvic muscles due to pressure from the decline in the infant's head, this anxiety and fear, can also increase the pain experienced by pregnant women. At the moment women experience fear and anxiety, the body will stimulate the hormones epinephrine and non-epinephrine, these hormones can exacerbate the pain a mother feels heavier [15]. Childbirth pain management should ideally be given during pregnancy. Mothers should be given information about pain reduction techniques when childbirth [16]. Labor pain and stress faced activates the sympathetic nervous system thereby increasing plasma concentrations catecholamine and may contribute to a prolong labor (long duration in the second stage of labour) [17]. One effort that can be made in reducing pain during the first stage of labor is to prepare pregnant women are physically and mentally from the third trimester of pregnancy through pregnancy exercise routine practice, preparation exercises if pregnant through physical movement aims to strengthen and stretch the muscles bibs especially the pelvic floor muscles, mental preparation during training is to teach relaxation techniques and teach her how to take a breather right. This technique can block stress hormones and oxygen supply would run smoothly, safely and spontaneous [17].

Based on the result of research on the impact of pregnancy exercise during pregnancy on adaptation response of childbirth pain in Joho Majolabab Sukoharjo Hospital using comparative approach to case control, found that respondents who participated in exercises during pregnancy contained as many as 11 people (27.55%) had pain being and as many as 10 (25%) of people at the level of severe pain [18].

Result of research on the effects of exercise pregnancy training during childbirth process in the Mother and Child Hospital Aisyiyah Yogyakarta using design of experiments found 15 pregnant women who participated in the training pregnancy exercise as many as 80% women who gave birth and 20% who experienced childbirth complications. While the 15 pregnant women who did not follow the exercise are 66.66% of pregnant mothers delivered with complication, and only 33.33% which maternity normal. Statistical test got p value of (0,025) $< \alpha$ (0,05) [19].

So that training of pregnancy exercise routinely conducted since the third trimester, pregnancy will make the mother calm in the face of childbirth. Pregnancy exercise is a method to prepare pregnant women not only physically but also mentally so that delivery went smoothly, safely and spontaneous. Training pregnancy exercise has a positive impact to flex the muscles in an effort to prevent the complications of childbirth. Pregnancy exercise also gives the mother a

sense of comfort, and training in making good breath to increase the consumption of oxygen during childbirth, in addition it makes to be easier mothers follow the instruction of doctors and midwives [13].

Based on the analysis of the implementation pregnancy exercise, it stated that pregnancy exercise can reduce the intensity of pain because the body is trained to perform movements that aim to maintain the elasticity and strength of muscles and joints associated with childbirth. When the contractions, muscles pelvic and ligaments hold the baby's head tension well, so that the sensation of pain is felt by the mother decreases. Pregnancy exercise also trains mothers to set good breathing, relaxation training done also beneficial for reducing stress levels, anxiety that pain intensity was reduced [15]. This research had been prepared and implemented suitable with scientific procedures, but the research still has limitation. This research was conducted only one Midwife Practice in the Bukit Tinggi, Padang-West Sumatera with a small number of samples required due to limited time, considering this research takes a long time. In applying pregnancy exercise, the limitation experienced is the difficulty of pregnant women to attend classes' pregnant women to join the exercise regularly.

CONCLUSION AND RECOMMENDATION

Pregnancy exercise training is effective for reducing pain of the first stage of childbirth. Pregnant women can be routinely doing pregnancy exercise, considering pregnancy exercise is effectively able to reduce first stage pain of pregnancy. Pregnancy exercise is a safe method of pain relief, can be done at home and cost-effectiveness. The presence of this research are expected for health workers especially midwives in order to provide information about the benefits of pregnancy exercise. Facilitating pregnancy exercise and teaching the mother how to do pregnancy exercise is so that pregnant women can independently do so. With pregnancy exercise undertaken during the third trimester of pregnancy the birth process that will be faced can work safely, smoothly and spontaneously.

REFERENCES

- [1] Varney,H., 2007. Buku Ajar Asuhan Kebidanan Edisi 4. Jakarta: EGC
- [2] Andarmoyo, S dan Suharti, S. 2013. *Persalinan Tanpa Nyeri: Konsep dan Aplikasi Manajemen Persalinan*. Yogyakarta: Ar-Ruzz Media
- [3] Fishman Scott, Ballantyne Jane, Rathmell James P. 2010. *Bonica's Management of Pain*. United Stated : Lippincott Williams & Wilkins)
- [4] Sani, R. 2002. *Manajer Kelahiran Yang Alami Edisi 1*, cetakan 1, PT Raja Grafindo Persabda, Jakarta.
- [5] Yuliasari. 2010. *Hubungan Pengetahuan dan Sikap dengan Pelaksanaan Senam Hamil Trimester II dan III di Puskesmas Ciputat*. (Skripsi). Program Studi Ilmu Keperawatan: Universitas Islam Negeri Syarif Hidayatullah Jakarta.
- [6] Muntainnah, Rina. 2016. *Pengaruh Pemberian Senam Hamil Terhadap Detak Jantung Janin pada Ibu Hamil*. (Skripsi). Universitas Hasanuddin: Program Studi Fisioterapi. <http://repository.unhas.ac.id/bitstream/handle/123456789/19341/SKRIPSI%20RINA%20MUTMAINNAH%20-%20C131%2012%20284.pdf?sequence=1>, diakses tanggal 28 Januari 2017
- [7] Aulia. 2014. *Hamil Sehat dengan Beragam Olahraga Ibu Hamil*. Yogyakarta: Buku Biru
- [8] Septaningtia, Yusnia Dwi dan Anjarwati. 2015. Hubungan senam hamil dengan lama proses persalinan kala II pada ibu Primigravida di RSKIA Sadewa Yogyakarta. <http://opac.unisayogya.ac.id/835/1/NASKAH%20PUBLIKASI.pdf>, diakses tanggal 15 Desember 2016.
- [9] Roni Arjatha. *Jurnal Efek Pemberian Tramadol Terhadap Nyeri Persalinan Pada Primigravida, 2007*.<http://usu.e-repository,2008> diakses tanggal 16 Agustus 2016.
- [10] Sugiyono, 2012 Sugiyono. 2012. Metode Penelitian Kuantitatif Kualitatif dan R&B. Bandung: Alfabeta
- [11] Budiyanto, Didik. Populasi, Sampling, dan Besar Sampel. Jakarta : Pusat Data dan Informasi Kementerian Kesehatan RI, 2013. Diakses pada 14 Desember 2016. <http://www.risbinke.litbang.depkes.go.id/2015/wpcontent/uploads/2013/02/SAMPLING-DAN-BESAR-SAMPEL.pdf>.
- [12] PE, Bijur., Silver, W., Gallagher EJ. 2001. Reliability of the visual analog scale for measurement of acute pain. *Academic Emergency Medicine*. 8(12):1153-1157
- [13] Wu, J., Chen, Y., & Luo, Y. (2014). Evaluation of the Visual Analog Score (VAS) to Assess Acute Mountain Sickness (AMS) in a Hypobaric Chamber, 9(11), 1–8. <http://doi.org/10.1371/journal.pone.0113376>.
- [14] Indriati.T.M. 2008. *Senam Hamil & Balita*. Yogyakarta: Cemerlang Publishing.
- [15] Kennedi, Besty., Donna, J.,Jean, M. 2013. *Modul Manajemen Intrapartum*. Jakarta : EGC.

- [16] Rankin, Jean. 2006. *Physiology in Childbearing with Anatomy and Related Biosciences*. United Kingdom.
- [17] Fishman Scott, Ballantyne Jane, Rathmell James P. 2010. *Bonica's Management of Pain*. United Stated : Lippincott Williams & Wilkins)
- [18] Miming, Istiqori. (2010). Pengaruh Senam Hamil Terhadap Respon Adaptasi Nyeri Proses Persalinan di Rumah Bersalin Citra Prasasti Joho Mojolaban Sukoharjo.
- [19] http://www.usahidsolo.ac.id/files/journals/3/articles/105/submission/105_208-1-RV.pdf. Diakses tanggal 12 April 2016.
- [20] Wahyuni, Sri., Wahyuningsih, Endang., Wahyuningsih, Astri. 2010. Pengaruh senam hamil terhadap proses persalinan. (Online). Diakses tanggal 14 Desember 2016. <http://download.portalgaruda.org/article.php?article=119613&val=5478>