

The Influence of Pregnancy Exercise on the Quality Of Sleep For Trimester III Pregnant Woman in Wonorejo Jatiyoso Village

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ABSTRACT

Background; Most pregnant women experience sleep disturbances that can be caused by physiological changes in pregnancy that can lead to things that are pathological. The result of poor sleep quality can be risky during pregnancy and childbirth. Pregnancy gymnastics is a movement exercise therapy to maintain the stamina and fitness of mothers during pregnancy. **Objective:** to determine the effect of pregnant gymnastics on the quality of sleep of third trimester pregnant women in Wonorejo Jatiyoso Village.

Methods; This study uses a type of quantitative research including pre-experimental design research with a one group pretest posttest design. The population of this study was 40 pregnant women and the sample size was 29 respondents. **Results;** Based on the results of research on the quality of sleep of third trimester pregnant women after being given pregnant gymnastics, some respondents improved their sleep quality, this can be seen from the quality of life score with an average of 4.89 which before being given pregnant gymnastics the average quality of sleep was 6.41. There was a change in sleep quality score of 1.59. **Conclusion;** The results of the paired sample test obtained the value of $t_{test} = 5.122$ with a $p\text{-value} = 0.001$ ($p < 0.05$) so it was concluded that there was an effect of pregnant gymnastics on the quality of sleep of third trimester pregnant women in Wonorejo Jatiyoso Village.

Keywords: pregnancy, pregnancy exercises, sleep quality

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INTRODUCTION

Pregnancy is the period of gestation starting from conception until the birth of the fetus. The length of normal pregnancy is 280 days (40 weeks or 9 months and 7 days) calculated from the first day of the last menstruation, pregnancy is divided into 3 quarters, namely the first quarter starting from conception to 3 months, the second quarter from the fourth month to 6 months, the third quarter from the seventh month to 9 months. (Aspiani, 2017).

Most pregnant women experience sleep disturbances that can be caused by physiological changes in pregnancy that can lead to things that are pathological for pregnant women who can cause various complaints of sleep disorders. The result of poor sleep quality can be risky during pregnancy and childbirth (Mindle et al., 2015).

Pregnant women are encouraged to do light exercise during pregnancy to keep their womb healthy and reduce problems that can arise during pregnancy varicose veins, hypertension, oedema, low back pain, shortness of breath, insomnia and other problems. Changes in hormone levels during pregnancy affect the systems of the expectant mother. Hormonal changes not only directly affect the sleep cycle, but also affect certain physical and mental changes that can cause sleep disturbances (Jamalzehi et al., 2017).

WHO estimates that 15-20% of pregnant women in both developed and developing countries will experience high risk (resti) and / complications. This condition can be prevented if pregnancy complications can be detected early high risk can be done through quality antenatal care which can reduce MMR by 20%. (Suarayasa, 2020).

A reduction in MMR which in 2022 the MMR in Indonesia has reached 230 per 100 thousand births (Indonesian Ministry of Health, 2020). The MMR

and Infant Mortality Rate (IMR) in Karanganyar Regency are still high when compared to surrounding areas. Many causes of maternal and infant mortality were found due to various factors. (Desvita Anggraini Wulandari and Is Hadri Utomo, 2017).

According to Farida & Sunarti (2015) exercise time during pregnancy is recommended during the third trimester of pregnancy, 28-30 weeks of pregnancy. Pregnancy gymnastics is a movement exercise therapy to maintain the stamina and fitness of mothers during pregnancy and prepare mothers physically and mentally to face labor optimally. One of the techniques in the pregnancy exercise procedure is relaxation exercises that combine muscle relaxation and respiratory relaxation. Pregnancy gymnastics will help mothers in a relaxed condition due to the formation of endoprin which provides a calming effect. Thus pregnant women easily sleep with good quality and quantity (Husin, 2014).

The purpose of the study was to determine the effect of pregnancy gymnastics on the quality of sleep of third trimester pregnant woman in Wonorejo Jatiyoso Village.

RESEARCH METHODS

The study used a type of quantitative research including *pre-experimental design* research with a *one group pretest posttest design*. The population of this study were 40 pregnant women in Wonorejo Jatiyoso village from June to July 2023. *Purposive sampling* technique.

Sample Inclusion Criteria: Gestational age 28-39 weeks, singleton pregnancy, Willing to participate in the study by agreeing to *informed consent*. Exclusion Criteria: Mothers who suffer from cardiovascular disease: heart, lungs, mothers with mental disorders, mothers who are in labor, mothers who have congenital diseases: asthma,

history of hypertension, infection and obtained a sample of 29 people. The research was conducted in Wonorejo Village, Jatiyoso District, Karanganyar Regency in July 2023 to August 2023.

The research instruments used pregnant exercise videos and the Indonesian version of the *Pittsburg Sleep Quality Index* (PSQI) questionnaire. The data that had been collected was then subjected to statistical analysis using the *paired sample t test*.

RESEARCH RESULTS

Age

Table 1 Descriptive statistics of respondents' age.

N	%	Mean	SD	Min	Maks
25	86.2				
		30.48	4.22	24	37
4	13.8				

Table 1 shows that most of the respondents were aged 20-35 years as many as 25 people (86.2%).

Gestational age

Table 2 Static description of gestational age.

Age pregnancy	n	%	Mean	Min	max
28-33 weeks	14	48.3			
			33.03	29	37
34-39 weeks	15	51.7			

Table 2 the gestational age of the respondents was mostly between 34-39 weeks as many as 15 people (51.7%). The youngest gestational age was 29 weeks and the oldest was 37 weeks.

Education level

Table 3 Distribution of respondents based on education level

Education level	Total	%
SMP	2	6.9
High School	21	72.4
PT	6	20.7
Total	29	100

Table 3 shows that most of the respondents' education level is high school (72.4%).

Sleep Quality of Third Trimester Pregnant Women before Pregnancy Gymnastics

Table 4 Statistical description of respondents' sleep quality before pregnancy gymnastics

Sleep quality before pregnancy exercises	n	%	Mean	Min	Max
Good	5	17.2			
			6.41	3	11
Bad	24	82.8			

Sleep Quality of Third Trimester Pregnant Women after Pregnancy Gymnastics

Table 5 Statistical description of respondents's sleep quality after pregnancy gymnastics.

Sleep quality after pregnancy exercises	n	%	Mean	Min	Max
Good	13	44.8			
			4.93	2	8
Bad	16	55.2			

Table 5 shows that respondents after doing pregnant exercises with poor sleep quality decreased to 16 respondents (55.2%). The score of sleep quality after doing pregnancy exercises twice a week for 2 weeks with the duration of each exercise about 15 minutes amounted to 4.93 with a standart deviation of ± 1.57 . the smallest score was 2 and the highest was 8.

Bivariate Analysis
Normality Test
Table 4.6 Normality Test Results

Sleep Quality	Z	p-value	Distribution
Before pregnancy exercises	0.951	0.196	Normal
After pregnancy exercises	0.948	0.162	Normal

Table 6 research data on sleep quality before and after pregnancy gymnastics is normally distributed. The research hypothesis test was continued by using the *paired sample* test comparative test.

The Effect of Pregnant Gymnastics on the Quality of Sleep of Pregnant Women in Trimester III

Table 7 effect of pregnancy exercises on sleep quality of thirt trimester pregnant woman.

Sleep quality	Mean	Mean difference	T _{test}	p-value
Before pregnancy exercises	6.41		5.122	0.001
After pregnancy exercises	4.93	1.59		

Table 7 shows that the score of respondents' sleep quality before doing pregnancy exercises was 6.41. The respondents' sleep quality improved after doing pregnant gymnastics to 4.93. The results of the *paired sample test* obtained the value of $t_{test} = 5.122$ with $p\text{-value} = 0.001$ ($p < 0.05$) so it was concluded that there was an effect of pregnant gymnastics on the sleep quality of third trimester pregnant women in Wonorejo Jatiyoso Village.

DISCUSSION

Mother's age

The results of the study on the age data of respondents were mostly

aged 20-35 years as many as 25 people (86.2%). The results of other research conducted by Alita (2020) stated that of the 30 respondents of third trimester pregnant women, had an average age of 28.67 years. The results of his research explained that most respondents were comfortable after participating in pregnant gymnastics at the Kramat Jati Jakarta Health Center.

Prawirohardjo (2014) states that the age of 20-35 years is medically an effective age range in pregnancy and childbirth because at that age the uterus is ready to accept pregnancy, mentally mature and able to care for the baby and himself. Age is also one of the factors that can affect sleep and a person's sleep needs (Indarwati, 2012). Research conducted by Hublin, et.al. (2017) states that the percentage of a person having poor sleep quality or sufficient sleep quality will increase about five times at an average age of about 25 years to 60 years Kemenkes RI (2017) explains that the sleep needs of each person vary according to their age. Sleep needs of people aged 17-40 years are between 7-8 hours per day. Therefore, pregnant women should strive to fulfill their sleep adequacy, which is around 7-8 hours per day. This need can be met from a night's sleep or in combination with a nap. If the night sleep can only be done 5-6 hours then the nap needs to be done 1-2 hours so that the sleep needs are fulfilled. It is even better if pregnant women sleep up to 9 hours per day. The results of research by Fanny et al (2022) mentioned 57.2% of respondents between 20- 35 years in the study of the effect of lavender aromatherapy on the quantity of sleep of third trimester pregnant women in PMB Padang city. Based on the results of this study, it is known that before doing pregnancy exercises, out of 25 respondents aged 25-35 years, 20 respondents (60%) had poor sleep quality while 5 respondents (40%) had good sleep quality.

Respondents after doing pregnant gymnastics, there was an increase in sleep quality, where 11 people had good sleep quality, while 14 people still had poor sleep quality.

Gestational age

The most respondents' gestational age was between 34-39 weeks as many as 15 people (51.7%), the average gestational age of respondents was 33.76 weeks with the youngest gestational age of 29 weeks and the oldest 37 weeks. The results of another study conducted by Lestari et al (2021) stated that all pregnant women with gestational age above 10 weeks participated in pregnancy exercises. The result of this study is that doing scheduled pregnancy exercises improves the quality of sleep of pregnant women at UPT Puskesmas Sooko Mojokerto Regency.

Fatimah and Nuryaningsih (2017) stated that approaching childbirth, pregnant women will find it difficult to adjust their sleeping position. This disorder can be caused by the greater the pregnancy so that the diaphragm will be pressed upwards and interfere with breathing. Pregnant women are advised to sleep on their left side or in a position that makes pregnant women comfortable. Poor breathing in pregnant women will affect the reduced oxygen supply to the brain so that it can affect sleep quality (Berman et al, 2021). Generally, in the third trimester or before labor, sleep disturbances reach their peak (Potter et al, 2021).

Based on the results of research from gestational age most respondents have poor sleep quality. Of the 15 respondents after 34- 39 weeks of pregnancy, before doing pregnant gymnastics 13 respondents (44.8%) had poor sleep quality, 2 respondents (6.9%) had good sleep quality. The respondents' sleep quality began to

improve after doing pregnant gymnastics, where 9 respondents (31%) with good sleep quality and 6 respondents (20.7%) were still with poor sleep quality.

Education level

The respondents' education level is known to be mostly high school education (72.4%). The results of similar research conducted by Oktaviani (2021) stated that the most respondents' education was middle level education (42.3%) in a study on the effect of giving pregnant exercises on the quality of sleep of third trimester pregnant women in Blora.

Wawan and Dewi (2013) argue that education can affect a person, including a person's behavior, especially in motivating attitudes towards development. The higher the education, the easier it is to receive information from various sources, both information from formal education and other information obtained from outside formal education.

The results of research on the level of education, it is known that Wonorejo Jatiyoso Village still has many mothers with high school education. For the Wonorejo Village community, high school level education is considered good, and until now the Wonorejo Village community has more high school level education than people who are educated in college. High school education in respondents is considered to be able to increase knowledge about the benefits of participating in pregnancy exercises, which such as maintaining fitness during pregnancy and smoothness in the process of childbirth, helping to improve sleep quality for third trimester pregnant women.

Based on the results of research from 21 respondents with high school education before doing pregnancy exercises, 16 respondents (55.2%) had poor sleep quality, 5 respondents (17.2%) had good sleep quality. After

doing pregnant gymnastics, 10 respondents (34.5%) with good sleep quality and 11 respondents (13.8%) still with poor sleep quality.

There is an increase in the quality of respondents' sleep in terms of educational background, so the respondent's education can affect the respondent's knowledge of the benefits of pregnant gymnastics training. Respondents' education is considered good, able to bring respondents to seek information about the benefits of sleep exercises in helping to improve sleep quality. Information obtained by respondents can be through mobile phone media that is easily accessible about the benefits and ways of pregnant exercises through channels such as YouTube which contains information on how to move pregnant exercises, the frequency and duration of pregnant exercises.

Sleep quality of third trimester pregnant women before doing pregnancy exercises

The quality of sleep of respondents before doing pregnant gymnastics was 82.8% with poor sleep quality. Research by Fitria et al (2022) states that the quality of sleep of third trimester pregnant women before doing pregnant gymnastics in Karang Anyar Village, Langsa Baro District, Langsa City is 88.9% poor. Assessment of sleep quality from the *Pittsburg Sleep Quality Index* (PSQI) if the score > 5 is included in the assessment of poor sleep quality.

Poor sleep quality in respondents can be seen from sleep latency. Sleep latency is the duration from going to bed to falling asleep. A person with good sleep quality spends less than 15 minutes to be able to enter the next stage of sleep completely. Conversely, more than 20 minutes a person who has difficulty in entering the next stage of sleep (Buysse et al.,

2016). Based on the results of the study, many respondents sleep on average above 22.00 WIB, and with a time of 20 to 30 minutes needed when starting to lie down to fall asleep (latency).

According to Perry And potter (2013) a person with good sleep quality spends less than 15 minutes to be able to enter the next stage of sleep completely. Conversely, more than 20 minutes indicates the level of insomnia, namely someone who has difficulty in entering the next stage of sleep. The beginning of the respondent's sleep is mostly above 22.00 WIB and the respondent has woken up at 03.30 04.00 WIB, so the amount of sleep is only 5-6 hours, minus the 20-minute sleep latency, therefore the respondent is still very lacking in sleep needs which are at least 8-9 hours per day.

The results of this study also found sleep disturbances that always appear in each respondent in the form of waking up at night to urinate which increases in pregnancy, the fetus is more active at night, hunger at night and uncomfortable sleeping positions that result in frequent waking every night. In addition to this, weather factors or air temperature can also affect, where hot air temperatures can cause frequent night awakenings. In June, the weather in Indonesia, including Wonorejo Village, is dry, so the air temperature can reach 34° C during the day and around 24° C at night. The impact of frequent night waking results in sleepiness during activities in the morning and afternoon.

Sleep quality of third trimester pregnant women after doing pregnancy exercises

Based on the results of research on the quality of sleep of third trimester pregnant women after being given pregnant gymnastics, some respondents improved their sleep quality, where before doing pregnant gymnastics, from 29 people with poor sleep quality to 16

people, meaning that there were 13 people who improved with good sleep quality, although overall there were still many respondents with poor sleep quality.

Mindell et al., (2015) stated that poor sleep quality in pregnant women can pose a risk to pregnancy, fetus, and postpartum (The impact of lack of sleep on pregnant women can cause stress, depression, emotional outbursts, and hypertension which can cause abortion in infants (Janiwarty & Pieter, 2013). Other complications can cause prolonged labor, increased pain perception, and increased operative births (Hashmi et al., 2016).

If pregnant women do not do pregnancy exercises, it will require more strength when straining and cause fatigue, besides that pregnant women experience back pain as a result of changes in the body's center of gravity caused by the growth of the enlarged uterus and pregnant women become tired quickly, besides that pregnant women tend to often feel cramps in the legs, especially in late pregnancy due to the enlarged uterus that presses on the nerves and blood vessels that supply the lower extremities (E. Sari, 2015).

Pregnancy exercises are very important for pregnant women after reaching 28 weeks of pregnancy. The goal is not only to reduce the incidence of prolonged labor but also for maternal comfort during pregnancy and reduce maternal anxiety in facing labor. The benefits of exercising during pregnancy are better blood circulation, increased appetite, better digestion, and better sleep.

The Effect of Pregnant Gymnastics on the Quality of Sleep of Pregnant Women in Trimester III

Based on the results of statistical analysis, it is known that there is an effect of pregnant gymnastics on the quality of sleep of third trimester pregnant

women with $p = 0.001$. The results of Kadir and Rosidi's research (2022) state that there are benefits of gymnastics to improve the quality of sleep of pregnant women during the Covid-19 pandemic. At the time of the pre test, 27 respondents had poor sleep and after the post test 26 people had enough sleep.

Sleep comfort disorders in third trimester pregnancy are caused by discomfort felt by pregnant women such as back pain and body aches. This is caused by an increase in the weight of the uterus which changes the center of balance of the body so that pregnant women have to stand with their shoulders slightly pulled back. Over a long period of time, this position will cause back pain and aches. The pain will increase throughout the day and get worse at night. In the middle of the night, pregnant women will have difficulty sleeping due to the discomfort of enduring the pain (Farida and Sunarti, 2015).

Disruption of sleep comfort in third trimester pregnancy can occur due to difficulty getting a comfortable position while sleeping due to the increasing size of the abdomen so that it is not free to sleep comfortably. Along with old gestational age, the abdomen will contract / active fetal movements such as kicking, making the mother feel uncomfortable and have difficulty sleeping at night. The enlarged uterus will press the diaphragm upwards as a result the work of the diaphragm in abdominal breathing will be limited, there is a lack of oxygen and pregnant women have difficulty breathing. If the breathing of pregnant women is not normal, the oxygen entering the brain will be reduced, thus disturbing the comfort of pregnant women to fall asleep and the amount of sleep decreases (Rottapel, 2020).

To help improve sleep quality, pregnant exercises can be done. The purpose of the movements in pregnant

gymnastics is the formation of body attitudes, stretching and strengthening muscles, especially muscles that play a role in labor and improve the work of the heart, blood vessels, and lungs in circulating nutrients and oxygen throughout the body (Pratigny, 2014). Physiologically, relaxation can shift autonomic nerve activity from sympathetic nerves to parasympathetic nerves.

Nerves in the parasympathetic are the controlling center in maintaining the state of sleep and during sleep parasympathetic nerve activity increases while sympathetic nerve activity decreases. Sönmez (2018) says that the state of wakefulness is controlled by the neurotransmitter norepinephrine. norepinephrine plays a role in waking up from deep sleep and is released by sympathetic nerve cells, so if norepinephrine levels decrease it can make sleep deeper.

When pregnant women feel relaxed after pregnancy exercises, it will be easier to fall asleep and get deep sleep due to the decrease in norepinephrine which is influenced by the dominant parasympathetic work when the mother is more relaxed. (Sönmez, 2018). The results of the study also showed that respondents after doing pregnancy exercises, from the data obtained there was a decrease in sleep latency, which was previously at least 20 minutes to under 20 minutes., daytime activities become better and not disturbed than

CONCLUSIONS

1. Third trimester pregnant women in Wonorejo Jatiyoso Village aged 20-35 as many as 25 people (86.2%), gestational age 34-39 weeks (51.7%), and most have a high school education (72.4%).
2. The quality of sleep of third trimester pregnant women before pregnant gymnastics showed a good

category of 5 people (17.2%) and a bad category of 24(82.8%).

3. The quality of sleep of third trimester pregnant women after pregnant gymnastics showed a good category of 13 people (44.8%) and a bad category of 16(55.2%).
4. There is an effect of pregnant gymnastics on the quality of sleep of third trimester pregnant women in Wonorejo Village with a p value = 0.001.

ADVICE

1. Third trimester pregnant women
It is necessary to do pregnancy exercises to get better quality sleep, can maintain adequate rest until the completion of labor.
2. Midwifery It is hoped that midwives can explore information on the benefits of pregnant gymnastics in third trimester pregnant women to help improve sleep quality.
3. Health Center
The results of this study indicate that giving pregnant exercises can improve sleep quality. The health center can provide health education through the provision of videos containing pregnant exercises that can be done at home in order to improve sleep quality.

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