THE EFFECT OF A COMBINATION OF PRENATAL YOGA, RELAXATION MUSIC, AND AGARWOOD AROMATHERAPY ON THE QUALITY OF WOMEN'S SLEEP OF THIRD TRIMESTER PREGNANCY

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ABSTRACT
A woman's body will experience significant changes during pregnancy, especially in the third trimester of pregnancy. Physical and psychological changes often cause a number of complaints, which have an impact on sleep disorders, thereby reducing sleep quality. Sleep is a vital activity for health. Sleep disturbances during pregnancy can pose risks. Non-pharmacological therapies that can overcome sleep difficulties in pregnant women include prenatal yoga, relaxation music, and aromatherapy. This study aimed to prove the effect of a combination of prenatal yoga, relaxation music, and agarwood aromatherapy on the sleep quality of pregnant women in the third trimester at the Karang Rejo Community Health Center. The research method used was an experimental research design using a one- group pretest-posttest approach without a control design. The number of samples in this study was 25 respondents with a sampling technique using a purposive sampling method, all respondents were given treatment for 2 weeks with a total frequency of administration 3 times, lasting +60 minutes for each treatment. The measuring tool in this study used the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The normality test used Shapiro Wilk, and the data analysis was carried out using univariate analysis and bivariate analysis using the Wilcoxon test The results of the research hypothesis testing p-value = 0.001 <0.05, meaning that there was a change before and after treatment. In conclusion, the combination of prenatal yoga, relaxation music, and agarwood aromatherapy influenced the sleep quality of third-trimester pregnant women at the Karang Rejo Community Health Center.

Keywords: agarwood aromatherapy; prenatal yoga; relaxation music; sleep quality

INTRODUCTION

A woman's pregnancy is a normal and natural physiological experience in her life (Azward et al., 2021) . The pregnancy process itself lasts for approximately 40 weeks, starting with the fusion of (Azward et al., 2021) spermatozoa and ovum (fertilization), then continued with implantation or nidation until the baby is born (Walyani, 2015). A woman's body will undergo significant changes during pregnancy, especially in the third trimester of pregnancy, pregnant women experience several physical and psychological changes. Physical changes such as increased frequency of urination, back pain, enlargement of the uterus and fetal movements, as well as psychological changes such as anxiety and fear of the imminent delivery process. This condition causes sleep disturbances in pregnant women and decreases sleep quality (Ismiyati & Faruq, 2020). Sleep quality is a person's satisfaction with their sleep and each person's ability to maintain a state of sleep and get the right NREM and REM sleep

stages (Indrayani & Muhayah, 2020) . The most common sleep problems include waking up at night as much as 52.40%, waking up to go to the bathroom as much as 73%, and feeling hot at night as much as 71.40%. As many as 57% showed symptoms of insomnia, all of which occurred during the month of pregnancy. The most common symptoms are restless legs syndrome (24%), breathing disturbances during sleep (19%), frequent urination (83%) and difficulty finding a comfortable sleeping position (79%) (Mindell et al., 2015).

The World Health Organization (WHO) reported a global prevalence of 41.8%. In Africa by 57.1%, America by 24.1%, and Europe by 25.1% of pregnant women suffer from sleep disorders (Aulia, 2021). The prevalence of pregnant women in Asia who experience sleep disorders is estimated to reach 48.2%. Only 1.9% of women during the third trimester of pregnancy do not wake up at night. Meanwhile, research shows that sleep difficulties often occur in pregnant women in Indonesia and are quite high, at 64% Azward et al., (2021). Sleep is a vital activity and essential for health (Rosyaria, 2022) . Sleep disturbances during pregnancy can pose risks such as fetal growth retardation in the womb, psychological alterations, and prolonged labor (Aulia, 2021). In addition, pregnant women become susceptible to various diseases such as heart problems, hypertension, gastrointestinal tract, preeclampsia, and so on. Both mother and child can experience both short-term and long-term effects of this condition (Indrayani & Muhayah, 2020).

Sedative-hypnotic drugs that are widely used in clinical interventions for sleep disorders certainly cannot be given to pregnant women, because of various side effects on pregnancy and fetus (Her & Cho, 2021) . To overcome sleep disorders in pregnant women, non-pharmacological treatment is the main alternative (Prihantiningsih, 2022). Non-pharmacological therapies that can overcome sleep difficulties in pregnant women include prenatal yoga, relaxation music, and aromatherapy. The word "yoga" comes from the Sanskrit word "yuj", which means to unite or blend. Prenatal yoga is a skill that develops a person's mind in the form of a holistic approach to their physical, psychological, and spiritual (Ismiyati& Faruq, 2020). Prenatal yoga is hatha yoga that is modified to meet the circumstances and needs of pregnant women. Prenatal yoga places a strong emphasis on breathing exercises, posture, relaxation, and meditation. These practices can be used as self-help tools to help mothers feel calmer, stronger, and more comfortable during pregnancy so that they can improve sleep quality (Rosdiana & Fitriani Lina, 2021).

In general, yoga is done with the accompaniment of relaxation music. Relaxation music is very synonymous with simple structure, melody, and harmony as well as soft melodies. Music can be used to relieve aches or pains, improve mood, and reduce muscle tension. The role of music is often focused as complementary therapy or an intervention medium in the ongoing healing process. The presence of music as a medium of non-pharmacological intervention can provide calm and comfort to patients, so that the healing process can be more effective and efficient (Kriswanto, 2020). Relaxation music therapy such as nature sound has been widely proven to be able to have a positive impact both physically and psychologically because it is able to reduce nerve activity, reduce brain activity, increase hormonal work so that it can affect sleep quality (C. Wang et al., 2021). Using music with a frequency of 432 Hertz as a tone is very beneficial for inducing sleep. The frequency of 432 Hertz is a frequency that is close to the natural frequency in humans and is most widely used in sound healing (Dubey et al., 2019).

In addition, another non-pharmacological therapy to overcome sleep difficulties is aromatherapy. Aromatherapy can help maintain health, refresh and calm the mind and body, including agarwood aromatherapy. Agarwood is one of the endemic plants of the island of Kalimantan (Pratama & Damayanti, 2022). Agarwood is included in the class of essential oils, has a distinctive smell so it is used as a raw material for aromatherapy, perfumes, cosmetics, incense to preservatives for various kinds of accessories (Mahdie et al., 2023). Agarwood oil contains sesquiterpene and chromon components that give rise to aromatic resins that are needed in the world of health. The aroma character of agarwood essential oil has a combination of wood and tropical spices (Fitri, 2020). According to the findings of the study, agarwood aromatherapy can cure depression and anxiety, due to its relaxing effects (Setiati et al., 2019). Inhaling the aroma of agarwood has been used as a traditional Chinese medicine for relaxation and improving sleep quality (C. Wang et al., 2023).

Based on a preliminary study conducted, by namnesizing pregnant women in the third trimester from questions on the Pittsburg Sleep Quality Index (PSQI) sleep quality questionnaire , it was obtained that of 33 pregnant women in the third trimester, the average pregnant woman experienced disturbances or difficulty sleeping in the third trimester. Based on the description above, this study needs to be carried out with the aim of proving "The Effect of a Combination of Prenatal Yoga, Relaxation Music, and Agarwood Aromatherapy on the Sleep Quality of Pregnant Women in the Third Trimester at the Karang Rejo Health Center".

METHOD
This study was a quantitative research with a quasi-experimental research design through a pretest-posttest one group without control design approach. This study provided an intervention and compared the analysis using pre-test and post-test questionnaires. The independent variable in this study was a combination of prenatal yoga, relaxation music, and agarwood aromatherapy, while the dependent variable in this study was the sleep quality of pregnant women in the third trimester. This research was conducted at the Karang Rejo Health Center, Tarakan City, in April 2024 with a total frequency of 3 doses for 2 weeks, lasting ±60 minutes per treatment. The sample used was 25 pregnant women in the third trimester with a nonprobality sampling technique, namely by purposive sampling. The instrument used in this study was the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The normality test used Shapiro Wilk. The data analysis carried out was univariate analysis and bivariate analysis with the Wilcoxon test.

RESULTS
This study was conducted at the Karang Rejo Health Center with a sample of pregnant women in the third trimester. This research begins with *a pre-test* then a *treantment* and then *a post-test*.

Table 1.
Respondent Characteristics (n=25)

Characteristic	f	%
Age		
<20	1	4
20-35	22	88
>35	2	8
Gravida		
Primigravida	8	32
Multigravida	12	48

Grandemultigravida	5	20
Education		
Basis	5	20
Intermediate	14	56
Tall	6	24
Work		
Not Working	21	84
Work	4	16
Total	25	100

Tabel 1. The results of the study showed that most of the respondents were at the age of 20-35 years, which was 22 people (88%). In terms of gravida characteristics, most of the respondents were in multigravida pregnancies, which was as many as 12 people (48%). In terms of educational characteristics, most of the respondents had a secondary education level, which was 14 people (56%), and in terms of job characteristics, the results showed that most of the respondents did not work, namely 21 people (84%).

Table 2.
Frequency Distribution Before Intervention (n=25)

Sleep Value and Quality *Pre-Test*	f	%
> 5 Poor	25	100
≤ 5 Good	-	-
Total	25	100

Table 2. the results of the study show that all respondents have a *pre-test score*, which is > 5. Based on the PSQI questionnaire in assessing sleep quality, a score of > 5 is included in the category of poor sleep quality and a score of ≤ 5 is included in the category of good sleep quality. So it was obtained that before the intervention, all respondents had poor sleep quality, which was as many as 25 people (100%).

Table 3.
Frequency Distribution After Intervention (n=25)

Post-Test *Sleep Score and Quality*	f	%
> 5 Poor	4	16
≤ 5 Good	21	84
Total	25	100

Tabel 3, the results of the study show that most of the respondents have a *post-test score*, which is ≤ 5. Based on the PSQI questionnaire in assessing sleep quality, a score of > 5 is included in the category of poor sleep quality and a score of ≤ 5 is included in the category of good sleep quality. Therefore, it was obtained that after being given the intervention, the respondents had good sleep quality, namely 21 people (84%) and those who still had poor sleep quality, namely as many as 4 people (16%).

Table 4.
Wilcoxon *Test* Effect of Combination of Prenatal Yoga, Relaxation Music, and Agarwood Aromatherapy on Sleep Quality (n=25)

	Median (Min-Max)	P value
Sleep quality before the intervention (n = 25)	10 (7-16)	0,001
Sleep quality after the intervention (n= 25)	5 (3-13)	

Tabel 4, it shows that the sleep quality of pregnant women before the intervention shows a median value of 10 with a minimum value of 7 and a maximum of 16. Meanwhile, after being given the intervention, it showed a median value of 5 with a minimum score of 3 and a

maximum of 13. Based on the PSQI questionnaire in assessing sleep quality, a score of > 5 is included in the category of poor sleep quality and a score of ≤ 5 is included in the category of good sleep quality. This showed that there was a decrease in sleep quality scores before and after the intervention. The results of *the Wilcoxon* statistical test obtained *a value of p value =* 0.001 (*p value* < 0.05), meaning that there was a difference in scores before and after the treatment. So there is an influence of a combination of prenatal yoga, relaxation music and agarwood aromatherapy on the sleep quality of pregnant women in the third trimester.

DISCUSSION
Based on table 1. Most pregnant women are in the age range of 20-35 years, this shows that there is public awareness to undergo pregnancy at a safe and optimal age. This is in line with research Riyanti et al., (2021) that states that a safe gestational age is between 20-35 years. This age range is a healthy and optimal reproductive period for pregnancy and childbirth. Although, pregnant women in the age range of 20-35 years are safe and optimal, it is possible that pregnant women also experience complaints of sleep disorders. Most pregnant women have the same complaints about pregnancy due to physical and psychological changes, it depends on their readiness to undergo pregnancy.

Based on table 1. It was also obtained that most pregnant women who experienced poor sleep quality were mothers with multigravida pregnancies. Pregnant women who have given birth, most of them have small children at home and have to take care of their children, so they often wake up at night. This is what results in poor sleep quality for mothers. This is in line with research that states Christian et al., (2019) that the responsibility of parenting for multigravida mothers is an external factor that can affect the quality of sleep of pregnant women. This condition is exacerbated by experiences that multigravida mothers have gone through before. The shadow of the pain she suffered during childbirth caused discomfort (Prihantiningsih, 2022) . In addition, several complaints that can affect the sleep quality of pregnant women in the third trimester such as frequent urination, difficulty breathing, pain and heat, do not have a significant difference regardless of the gravida, generally experience complaints of difficulty sleeping (Wulandari & Wantini, 2020) . Differences in burdens and responsibilities as well as maternal experiences generally affect sleep quality (Christian et al., 2019).

Based on table 1. It was also obtained that most of the respondents were at the secondary to higher education level, this shows that they tend to be more receptive to new information and more easily motivated to follow directions from health workers, especially those related to health and beneficial to them such as attending prenatal yoga classes to reduce complaints from discomfort experienced by pregnant women, namely difficulty sleeping. This is in line with research Maulidia & Nursanti, (2019) that states that a person's level of education can affect their behavior. The higher the level of education, the easier it will be for a person to receive new information. Some complaints towards the end of pregnancy that can affect the mother's sleep do not have a significant difference regardless of the education, whether basic, intermediate to high, to the quality of her sleep (Wulandari & Wantini, 2020). The difference in receiving and processing information generally affects the motivation of mothers to make efforts to reduce complaints of poor sleep quality (Maulidia & Nursanti, 2019).

Based on 1. Most of the respondents who took prenatal yoga classes were pregnant women who did not work, which shows that mothers who do not work formally mean that outside of household chores are more able to set aside their time to attend prenatal yoga classes. Unlike mothers who have formal jobs, it is more difficult to set aside time to attend prenatal yoga

classes. This is in line with research   Prihantiningsih, (2022) that states that working mothers have more pressure and a heavier workload, making it difficult to divide their time. Meanwhile, mothers who do not work are more able to set aside time and opportunities to prepare, seek and learn about preparing for childbirth. The difference in load and time generally affects the mother's efforts to reduce complaints of poor sleep quality (Prihantiningsih, 2022)

Based on table 2. shows that all respondents have a pre-test score of > 5. This means that all respondents had poor sleep quality before the intervention, which was as many as 25 people (100%). Based on research Prihantiningsih, (2022) , most of the respondents experienced difficulty sleeping because pregnant women who entered the third trimester experienced several significant physical and psychological changes, so that complaints increasingly appeared at the end of pregnancy and resulted in mothers easily waking up at night. Based on subjective observations by researchers at the time of the pre-test, it was found that most of the respondents seemed lethargic and unable to concentrate fully. Pregnant women experience sleep pattern disturbances due to the discomfort they experience towards the end of pregnancy. When the mother, does not try to overcome these complaints, resulting in poor sleep quality for the mother (Ismiyati & Faruq, 2020).

Based on table 3. the results of the study show that most of the respondents have a post-test score of ≤ 5. This means that after being given the intervention, most of the respondents had good sleep quality, namely 21 people (84%) and those who still had poor sleep quality as many as 4 people (16%). However, respondents who are still in the category of poor sleep quality, based on the calculation of the PSQI questionnaire, still experience a decrease in scores, meaning that there is a change from bad to better, pregnant women experience a decrease in disorders that are a factor in difficulty sleeping. Based on research Prihantiningsih, (2022), the quality of sleep has improved, pregnant women who previously had poor sleep quality have become good, because the movements of prenatal yoga bring positive energy in the union of each movement, so that the body feels more relaxed and calm. Based on subjective observations by researchers at the time of the post-test, it was found that most of the respondents seemed better and more enthusiastic than at the time of the pre-test. Each yoga pose that has been adjusted to the condition of pregnant women becomes a body flexibility exercise so that it can reduce some physical complaints such as pain. Meanwhile, in pranayama and meditation, it helps to create calm until it enters the mother's subconscious (Dwitya & Adnyani Widi, 2021) . The combination of nature sound relaxation music accompaniment has a combination of the sound of the gurgling of water, wind, and birdsong (Rahmawati, 2020) This nature sound provides a relaxing effect that can create comfort (Shakespeare et al., 2021). Then combined with agarwood aromatherapy which contains sesquiterpenes and chromones creates a sense of relaxation that enters the soul of the pregnant woman so that the mother's breathing becomes more regular, because that is why the quality of the mother's sleep becomes good (C. Wang et al., 2023).

In this study, a combination of prenatal yoga, relaxation music, and agarwood aromatherapy was carried out to 25 respondents in the third trimester with complaints of poor sleep quality by distributing a PSQI questionnaire as a pre-test, then given a combination of prenatal yoga, relaxation music, and agarwood aromatherapy 3 times in 2 weeks, and after the study was completed, the researcher evaluated and distributed the PSQI questionnaire again to assess the quality maternal sleep as a result of the post-test. The prenatal yoga activity began by turning on 5 drops of agarwood aromatherapy in 100 ml of water on a taffware air humidifier aromatherapy oil diffuser and turning on relaxation music of nature sound with its simple

melody and harmony as well as instruments that involve a combination of water ripples, bird chirping and soft piano melodies with a frequency of 432 Hertz from bluetooth speaker portable microphone set which has been prepared by researchers. Prenatal yoga starts from centering, pranayama, warming up, and core yoga or asana movements based on squencing, to cooling down and relaxation for ±60 minutes.

Based on table 4, this study obtained the results that there was a difference in scores before and after the treatment. Where the results of the PSQI questionnaire measure are if the score value is > 5, the quality of sleep is poor and if the score value is ≤ 5, it means that the quality of sleep is good. The average result of sleep quality scores before and after the combination intervention of yoga, relaxation music, and agarwood aromatherapy decreased in sleep quality scores, with p value = 0.001 (p value < 0.05) meaning that there was a difference in scores before and after treatment. So there is an influence of a combination of prenatal yoga, relaxation music and agarwood aromatherapy on the sleep quality of pregnant women in the third trimester.

Mothers who do yoga can increase the production of endorphins and serotonin hormones, where these hormones function to carry messages between cells in the brain and play a role in improving mood and sleep better, so that it can help mothers improve their sleep quality (Wahyuni, 2022). Breathing using the pranayama technique in yoga will expand and stretch the vagal tissue and lungs, causing a decrease in heart rate, blood pressure and metabolism in the body (Yulianti et al., 2018). In addition, the combination of relaxation music has a positive effect on the human respiratory system, heart rate and blood pressure because it causes a relaxation response to the body. Relaxation music can change mood and increase parasympathetic activity, thus helping to improve the quality of one's sleep (C. Wang et al., 2021). Relaxation music with a frequency of 432 Hertz with a slow rhythm and tempo has physical and psychological relaxation effects (Nasso, 2016). Apart from that, sounds from the 432 Hertz frequency are associated with a peaceful, harmonious and pleasant atmosphere (Aravena et al., 2020). Then, combined again with aromatherapy, where agarwood aromatherapy contains sesquiterpenes and chromones that cause a fragrant resin aroma whose pharmacological activity is known to be anti-depression and stress which can reduce tension so that it can create a relaxing effect and improve sleep quality (Fitri, 2020).

This is in line with the research conducted by Azward et al., (2021) the results that there was a significant change in the sleep quality of pregnant women in the third trimester after doing yoga. Meanwhile, research on relaxation music in improving sleep quality was conducted by C. Wang et al., (2021) showing that music interventions are beneficial for improving sleep quality, especially in sleep duration, sleep efficiency, and sleep dysfunction. Meanwhile, research conducted by C. Wang et al., (2023) obtained that inhaling the aroma of agarwood has anti-anxiety and antidepressant properties because it provides a relaxing effect and can improve sleep quality.

CONCLUSION
Based on the explanation that has been outlined by the researcher regarding "The Effect of a Combination of Prenatal Yoga, Relaxation Music, and Agarwood Aromatherapy on the Sleep Quality of Pregnant Women in the Third Trimester at the Karang Rejo Health Center", it can be concluded that the characteristics of the respondents in this study are mostly 20-35 years old, with multigravidal pregnancies, secondary education, and most mothers do not work. Where, the sleep quality of pregnant women in the third trimester before being given the intervention all respondents experienced poor sleep quality with a score of > 5, which was as

many as 25 people (100%). Meanwhile, the sleep quality of pregnant women in the third trimester after being given the intervention, as many as 21 people (84%) had good sleep quality with a score of ≤ 5 and 4 people (16%) still had poor sleep quality with a score of > 5. Based on the hypothesis test with the Wilcoxon test, it was obtained that the sleep quality of pregnant women in the third trimester at the Karang Rejo Health Center experienced significant changes with a p value = 0.001 (p value < 0.05). So there is an influence of a combination of prenatal yoga, relaxation music, and agarwood aromatherapy on improving the sleep quality of pregnant women in the third trimester.

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