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Prenatal yoga exercise improves sleep quality in the third trimester of pregnant women☆

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ABSTRACT

Objective: This study aims to determine the effect of prenatal yoga exercises on sleep quality in third-trimester pregnant women.
Methods: It was a quasi-experimental (Nonequivalent Control Group Design). The study was conducted at the Ma'rang Community Health Center in Pangkajene and Kepulauan District from January to March 2020. The sample in this study was 60 pregnant women with gestational age 28 weeks divided into two groups, namely 30 control groups, namely pregnant women who visited routine antenatal check-ups as usual, and 30 people in the intervention group were given prenatal yoga exercises four times in two weeks selected based on purposive sampling techniques. Data analysis using the Wilcoxon test ($p < 0.05$).
Results: Statistical test results showed that in the control group (p-value 0.001 < 0.05) and intervention (p-value 0.001 < 0.05), there were significant differences in sleep quality before and after the intervention was given.
Conclusion: Prenatal yoga exercises improve the sleep quality of third-trimester pregnant women.

Introduction

Pregnancy is a natural and physiological event in a woman's life process. Pregnancy is not a disease or disorder. Where pregnancy is an event that begins with conception, namely the process of meeting and fertilizing (fertilizing) ovum cells by sperm cells that will occur after a woman ovulates, i.e., the release of the ovum from the ovary that occurs around 10–16 days after menstruation, every pregnant woman passes through the stage of problems in her pregnancy. Therefore physical health must be adequately prepared. Pregnancy is defined as a period where there are dramatic changes both physiological, psychological, and adaptation in women.[1]

Various complaints of pregnant women, especially in the third trimester of pregnancy, are shortness of breath, lower back pain, hemorrhoid, sleep disturbance, pain in the pelvic area, dizziness, abdominal cramps, leg cramps, frequent urination, and discomfort due to sudden and anxious contractions. One complaint in pregnant women that often occurs is sleep disturbance even though the pregnancy is normal.[2]

Sleep disorders that pregnant women often experience are a decrease in sleep duration.[3] Most pregnant women experience sleep disorders, and only 1.9% of women do not wake up at night during the third trimester of pregnancy. Sleep disturbance in pregnant women can decrease the percentage of slow sleep waves and REM sleep (Rapid Eye Movement), increasing in stage one. Sleep disturbance in pregnant women occurs in the first trimester, second trimester, and third trimester. Sleep disorders are more likely to be complained of in the third trimester.[3] In the third trimester, the number of sleep disorders is higher due to discomforts such as back pain. This is due to compensation from enlargement of the uterus to the anterior position, and lordosis shifts the center of the heavy power back toward the two limbs. Sacroiliac and pubic joints will increase in mobility, which is thought to be due to hormonal influences, this causes discomfort in the lower back, especially at the end of pregnancy, urinating a lot and spontaneously waking up from sleep.[4] Fetal movements, heartburn, cramps in the legs, fatigue, and difficulty starting sleep or difficulty sleeping until morning.[5]

As a result of lack of sleep, pregnant women complained of feeling not fresh, often yawning, and easily tired when doing activities during the day. The average pregnant woman complains of causes of sleep problems due to uncomfortable sleeping position, back pain, difficulty breathing, anxiety, and frequent urination at night.[6]

Husin (2014) said that a study conducted by the National Sleep Foundation (2007) stated that more than 79% of pregnant women experience sleep disturbances. Frequent fatigue and sleep disorders are some of the most common complaints made by pregnant women.[7,8] On average, 60% of pregnant women feel tired often at the end of the semester, and more than 75% complain of disturbance of sleep patterns. The results showed that the majority of respondents had poor sleep quality (53%). The prevalence of sleep disorders in Indonesia in pregnant women is relatively high at around 64%. Pregnant women who experience sleep apnea by 65% are forced to undergo a cesarean section, and about 42% experience preeclampsia.

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One of the sports needed for pregnant women is relaxation techniques such as yoga, music therapy, swimming, deep breathing, and walking (Yuliarti, 2010). Prenatal yoga combines complex activities containing stretching, movement, meditation, breathing, endurance, balance, and appreciation. The most important thing in practicing yoga is to be accompanied by breathing techniques to provide oxygen to the entire body so that it is at its maximum peak. The purpose of prenatal yoga is to prepare pregnant women physically, mentally, and spiritually for labor. With careful preparation, the mother will be more confident and gain the confidence to go through labor smoothly and comfortably.[9]

Based on a preliminary study conducted at the Ma'rang Health Center in Pangkajene and Kepulauan District on November 19, 2019, through informal interviews with five trimesters III pregnant women who visited the Ma'rang Health Center, found that three pregnant women who complained often woke up at night because it was difficult to determine comfortable position, increased frequency of urination and back pain that causes discomfort in sleep. Two pregnant women said can sleep well and comfortably. All of these pregnant women have never participated in yoga exercises during their pregnancy. The number of visits of pregnant women in November 2019 reached 135, while in December 2019, it increased by 152 pregnant women. Therefore, researchers are interested in researching the effect of prenatal yoga on sleep quality of third trimester pregnant women in the Ma'rang Community Health Center in the work area in Pangkajene and Kepulauan Regency.

Methods

Research design

This research has been approved by the ethical committee of Hasanuddin University, faculty of medicine. The type of research used is quasi-experiment with a nonequivalent control group design. Respondents were divided into two groups: the control group was pregnant women who did routine antenatal check-ups as usual, and the intervention group was pregnant women who were given prenatal yoga exercises four times in two weeks. Pretest and post-test is done one time each. The sample in this study was 60 third-trimester pregnant women, 30 samples in the control group, and 30 samples in the intervention group. The inclusion criteria include single pregnancy, gestational age ≥28 weeks, willingness to take yoga practice four times in 2 weeks, and fetal growth and development according to gestational age. This research was conducted using a questionnaire instrument related to the characteristics of respondents and sleep quality measurements using the PSQI (Pittsburgh Sleep Quality Index). The analysis in this study used a statistical test, a homogeneity of variance test to assess the distribution of data in both groups, and the Wilcoxon test to assess changes in sleep quality before and after the intervention was given.

Place and time of research

This research was conducted in the working area of the Ma'rang Community Health Center in Pangkajene and Kepulauan Regency in January–March 2020.

Method of collecting data

Data collection was carried out by the researchers and assisted by the assisting midwives using pre-post-tested questionnaires before the intervention and measured again after the administration of the intervention.

Table 1
Distribution of respondents' characteristics.

Characteristics	Frequency (%)		*p*-Value[a]
	Control ($n = 30$)	Intervention ($n = 30$)	
Age			0.759
No risk	24 (80.0)	23 (76.7)	
High risk	6 (20.0)	7 (23.3)	
Education			0.599
High	12 (40.0)	10 (33.3)	
Low	18 (60.0)	20 (66.7)	
Parity			0.799
Primipara	13 (43.3)	17 (56.7)	
Multi-Parallel	16 (53.3)	13 (43.3)	
Grandemultipara	1 (3.3)	0 (0.0)	
Profession			0.229
Does not work	21 (70.0)	25 (83.3)	
Work	9 (30.0)	5 (16.7)	
Information about yoga			–
Never get information before	30 (100.0)	100.0	

[a] Homogeneity of variance test.

Data analysis

Test the respondents' homogeneity characteristics, a test of homogeneity of variance was performed. The Wilcoxon test and Mann–Whitney test were used to assess the effect of prenatal yoga exercises on sleep quality in trimester III pregnant women.

Results

The sample in this study was third-trimester pregnant women with inclusion criteria as many as 30 people, 30 samples as an intervention group (prenatal yoga exercises), and 30 samples of pregnant women as a control group (without prenatal yoga exercises). This study aims to determine whether there is an effect of prenatal yoga training on sleep quality in third-trimester pregnant women.

Table 1 shows the characteristics of respondents in the control and intervention groups. All the characteristics of respondents have homogeneous data variation between groups, which can reduce the bias of the intervention given because both groups of respondents have the same characteristics.

The two dominant groups have ages between 20 and 35 years with no risk category based on age. When viewed from the last education, both groups tend to be poorly educated. Parity shows that in the multipara dominant control group that has given birth to more than one child, primipara has never given birth to a child in the dominant intervention group. Based on work, pregnant women in both groups tend not to work (as a housewife), and all pregnant women have never gotten information about yoga.

Bivariate analysis

In the control group, statistical tests showed no differences in the sleep quality of third-trimester pregnant women pre and post-test ($p > 0.05$). The data shows that more pregnant women have a sedentary quality of sleep pre and post-test. Likewise, subjective sleep quality components of pregnant women in the dominant control group settled pre and post-test.

In the intervention group, statistical tests showed differences in the sleep quality of pregnant women trimester III pre and post-test ($p < 0.05$). This is supported by most pregnant women who show improved sleep quality after participating in yoga exercises four times in 2 weeks (60–90 min per training session). This means that there is a significant influence between prenatal yoga practice on

Table 2
Differences in the provision of prenatal yoga gymnastics to sleep quality in pregnant women trimester III.

Variables and components	Group	
	Control	Intervention
Sleep quality pre-post		
p-Value[a]	0.257	<0.001
Decrease	2	18
Increase	5	1
Stay	23	11
Subjective sleep quality pre-post		
p-Value[a]	0.317	0.001
Decrease	1	19
Increase	0	3
Stay	29	8
Sleep latency pre-post		
p-Value[a]	1.000	0.268
Decrease	2	9
Increase	2	6
Stay	26	15
Long nights sleep pre-post		
p-value[a]	0.705	0.013
Decrease	1	15
Increase	3	5
Stay	26	10
Efficiency of sleep pre-post		
p-Value[a]	0.257	0.144
Decrease	2	12
Increase	5	6
Stay	23	12
Disorders of sleep at night pre-post		
p-Value[a]	0.414	0.109
Decrease	2	10
Increase	4	4
Stay	23	16
Using sleeping pills pre-post		
p-Value[a]	1.000	1.000
Decrease	0	0
Increase	0	0
Stay	30	30
Disruption of daytime activities pre-post		
p-Value[a]	0.564	0.080
Decrease	2	14
Increase	1	6
Stay	27	10

[a] Wilcoxon test.

sleep quality in third-trimester pregnant women before and after the intervention.

Discussion

Sleep quality is one's satisfaction with sleep. The person does not show feelings of fatigue, anxiety, lethargy and apathy, blackness around the eyes, swollen eyelids, red conjunctiva, sore eyes, fragmented attention, fragmented attention, headaches, and often yawning and drowsiness. Sleep quality affects human health both for the day and for the long term. The quality of sleep determines fitness when waking up throughout the night. Good quality sleep can help us be more refreshed in the morning.

In pregnant women experience frequent night awake, insomnia, and restless sleep at the end of pregnancy. Physiological changes such as increased progesterone and prolactin levels, fetal movements, and bladder distention can explain some of the sleep disorders of pregnant women. Pain can also cause poor sleep quality. The prevalence of low back pain in pregnant women is high, with studies showing a prevalence of 24% to 90% of pregnant women.[10]

Based on Table 2, three components of sleep quality differ significantly pre and post test, namely subjective sleep quality has increased after yoga exercises, the length of night sleep increases after yoga exercises, and decreased activity disruption during the day. So it can be concluded that yoga exercises can affect the sleep quality of pregnant women because it improves the quality of sleep from the subjective aspects, sleep duration and reduced activity interruption during the day.

Subjective sleep quality is a brief evaluation of one's sleep about whether sleep is very good or very bad.[11] The results showed that the subjective sleep quality of pregnant women in the control group expressed a lack of sleep quality with increasing gestational age. In contrast, pregnant women in the intervention group subjectively stated that their sleep quality tended to be very good after following prenatal yoga exercises. Before being given prenatal yoga exercises, only six respondents had very good sleep quality and increased by 21 respondents who had very good sleep quality after taking prenatal yoga practice. In line with research conducted by Fathia (2014), the results showed sleep quality obtained from the results of the PSQI questionnaire that the respondents before doing yoga exercises obtained an average value of 9 and after doing yoga exercises obtained an average value of 4. Thus, sleep quality is good if the number of assessment scores is <5, while sleep quality is poor if the number of assessment scores is ≥5.

According to Lebang (2013) yoga exercises are given to pregnant women according to the physical conditions of pregnant women.[12] Yoga exercises with slow movements can be combined with controlled breathing exercises and a series of contraction stretching and relaxing muscle groups. Yoga exercises can stimulate the relaxation response both physically and psychologically, where the response stimulates the activity of the parasympathetic autonomic nervous system, which is located below the pons and medulla, which results in a decrease in body metabolism, heart rate, pulse, blood pressure, and respiratory rate and an increase in serotonin so that the body becomes more relaxed and can improve sleep.

Sleep duration or duration is calculated when pregnant women sleep until awakening in the morning without mentioning waking at midnight. The results showed that pregnant women's night length sleeps in the dominant control group <5 h while in the dominant intervention group >7 h.

In line with the research results conducted by Dewantri in 2015, the duration of vigilance at the end of pregnancy is increasing for nocturia and physical disorders (minimum 2–4 h in one night).[13] This situation shows that the decrease in total sleep duration negatively affects sleep quality and is associated with physical disturbance, mechanical and hormonal changes during pregnancy. While in the intervention group, after being given prenatal yoga exercises four times in two weeks, it felt easier to start sleeping. This is felt because the complaints such as back pain, tightness, and position discomfort during sleep began to decrease. This is because yoga is beneficial to reduce complaints felt by pregnant women and feel freshness when they wake up. It can be concluded that prenatal yoga exercises can increase the duration of sleep for pregnant women.

Daytime dysfunction in pregnant women who have poor sleep quality indicates drowsiness during daytime activities, lack of enthusiasm or attention, sleep throughout the day, fatigue, depression, ease to experience distress, and decreased ability to move.[11] The results showed a significant difference between pre and post, i.e., decreased activity disruption during the day after participating in yoga exercises. According to Pieter and Lubis in 2010, pregnant women will experience emotional, psychological changes, tend to be lazy, sensitive, easily jealous, ask for more attention, feelings of discomfort, depression, stress, and anxiety.[2]

The researchers assume that the disruption of daytime activity in pregnant women is caused by increased anxiety, physical

discomfort, and anxiety. Yoga with Suryanamaskar movement consists of 12 dynamic and energetic movements with regular breathing every 1–2 min and ended with meditation to help calm the mind. Based on several studies, it was stated that yoga exercises could help provide peace of mind and mind because it can be used as one of coping stress (Bribiscas, 2013; Williams-Orlando, 2013; Bala, 2012) and increasing self-efficacy (Williams-Orlando, 2013; Khalsa, Butzer, Shorter, Reindhart & Cope, 2013).

According to researchers, improving sleep quality in third-trimester pregnant women is caused by feeling deep relaxation, reducing tension in the body, mind, and mentally make more comfortable and confident in preparing for labor. Pregnant yoga exercises provide several benefits such as easing pain in some parts of the body, regulating the rhythm of the breath to achieve a relaxed condition, regulating heart rhythm, and improving sleep quality. Therefore this exercise is essential for pregnant women, especially third-trimester pregnant women, in addition to increasing stamina and one way to overcome sleep disorders. Soft yoga movements, breathing, and relaxation will provide comfort and improve the quality of sleep for pregnant women.

This study is in accordance with research Hannatuzzahro (2016) provides yoga exercises twice a week with a post-test gave three days after the second treatment with the results of the average value before yoga exercises 9.64 and after yoga exercises 4.13 and *p*-value 0.004 then there are differences in sleep quality of pregnant women gestational age 30–35 weeks before and after yoga exercises at RB NW.[14] This is in line with Sindhu's quote (2014). It is strongly recommended to practice yoga 1–2 weeks with instructor guidance for 60–90 min.[15]

According to Sun et al. (2010), yoga also reduces feeling and eliminates some discomfort in pregnancy, increases muscle strength which is especially useful in preventing back pain, can help pregnant women feel more agile and nimble and balance changes in body weight, and facilitate changes in gravity style during pregnancy.[16] The practice of yoga in this study not only strengthens the shoulder, back, and leg muscles. However, it also helps to get the correct body position, which can reduce back pain in pregnant women.

Yoga exercises can bring many benefits, namely increasing vital energy and endurance, releasing stress and anxiety, improving sleep quality, relieving muscle tension, reducing general physical complaints during pregnancy, such as back pain, pelvic pain, to swelling of body parts, helping the process of healing and recovery after giving birth, stabilizing the emotions of pregnant women who tend to fluctuate, strengthen determination and courage, strengthen self-confidence and focus, build positive affirmations and the strength of the mind during childbirth and calms the mind through relaxation and meditation, gives quiet time to create an inner bond between mother and baby, instills a sense of patience, intuition and wisdom.

This study is in accordance with Mediarti researchers (2014) said there was a significant difference between complaints of pregnant women before doing antenatal yoga exercises and after doing antenatal yoga.[17] Because the quality of sleep in pregnant women is primarily influenced by complaints felt by pregnant women, so with yoga exercises, differences felt by the third trimester pregnant women can occur. Research by Harahap (2017) states that yoga effectively affects the quality of sleep of pregnant women because the yoga movement can control breathing and the mind. The real benefits of yoga can be felt from yoga practice, the reduced melting of the mind, and emotions become calm.[6] In line with Jiang's research (2015), said prenatal yoga interventions are effective in relieving pain for pregnant women who experience back pain and reducing leg pain; improved health of the prenatal yoga program observed during pregnancy is more beneficial than walking and standard prenatal exercises that yoga is very suitable for pregnancy.[18] The study is in line with this study because complaints felt by pregnant women largely influence the decrease in sleep quality of pregnant women.

The research analysis results prove that yoga exercises can have a positive influence, especially on the quality of sleep of the mother during pregnancy. This is because yoga exercises are an exercise in pregnant women that aims to help the abdominal wall muscles become elastic during uterine enlargement, improve the physical balance of pregnant women, help improve the correct position of the mother during pregnancy, and improve maternal blood circulation, thereby increasing maternal comfort during pregnancy (Ministry of Health, RI, 2010).

The researchers assume that yoga exercises are performed four times in 2 weeks, where the first yoga exercises do breath awareness, warm up the core movements of yoga exercises, then meditate. All movements make gentle calm, the mind will become more calm, and body relaxed. Before given yoga exercises intervention most of the third trimester pregnant women experience poor sleep quality, and after being given yoga exercise intervention four times found that respondents were easier to start sleeping because of complaints perceived as not being able to breathe comfortably, back pain begins to decrease this is because yoga exercises are beneficial to reduce complaints during pregnancy, making the body, mind, and soul relaxed and calm. So that all respondents experienced an increase in sleep quality from poor sleep quality to good sleep quality.

Conclusion

The results of data analysis in the intervention group showed differences in sleep quality improvement for third trimester pregnant women after being given prenatal yoga exercises in the working area of the Ma'rang Community Health Center in Pangkajene and Kepulauan Regency.

Conflict of interest

The authors declare no conflict of interest.

References

1. Dahro A. Psikologi kebidanan: Analisis perilaku wanita untuk kesehatan. Jakarta: Salemba Medika; 2012.
2. Pieter HZ, Lubis NL. Pengantar psikologi untuk kebidanan. Jakarta: Kencana Prenada Media Group; 2010.
3. Field T, Diego M, Hernandez-Reif M, et al. Sleep disturbances in depressed pregnant women and their newborns. Infant Behav Dev. 2007;30:127–33.
4. Prawirohardjo S. Ilmu kebidanan. Jakarta: PT. Bina Pustaka Sarwono Prawirohardjo; 2009.
5. Grace PA, Borley NR. At a glance: Ilmu bedah. Surabaya: Erlangga; 2004.
6. Harahap SD, Utami S, Huda N. Efektivitas yoga terhadap kualitas tidur ibu hamil. J Online Mhs Perpust Fak Keperawatan Univ Riau. 2018;5.
7. Irianti B, Husin F. Asuhan kehamilan berbasis bukti. Jakarta: Sagung Seto; 2014.
8. National Sleep Foundation. 2007 Women and sleep [Internet]; 2007. Available at: https://www.sleepfoundation.org/professionals/sleep-americar-polls/2007-women-and-sleep.
9. Pratignyo T. Yoga ibu hamil plus: Postnatal yoga I. Jakarta: Pustaka Bunda; 2014.
10. Triana Ai M. Pengaruh prenatal gentle yoga dengan peningkatan kualitas tidur ibu hamil trimester III di klinik Pratama Ratna Komala Bekasi tahun 2019. J Ilm Kesehat Delima. 2020;4.
11. Buysse DJ, Monk TH, Berman SR, et al. The pittsburgh sleep quality index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989;28:193–213.
12. Lebang E. Yoga sehari-hari. Jakarta: Pustaka Bunda; 2013.
13. Dewantri A. Gambaran kualitas tidur ibu hamil pada mahasiswa profesi ners Program Studi Ilmu Keperawatan Universitas Diponegoro dan Stikes Ngudi Waluyo Semarang. Universitas Diponegoro; 2015.
14. Hannatuzzahro S. Perbedaan kualitas tidur ibu hamil usia kehamilan 30-35 minggu sebelum dan sesudah senam yoga di RB "NW" Ungaran tahun 2016. Sekolah Tinggi Ilmu Kesehatan Ngudi Waluyo; 2016.

15. Sindhu P. Yoga untuk kehamilan edisi yang diperkaya sehat, bahagia dan penuh makna. Bandung: Qanit; 2014.
16. Sun J, Song H, Zhao J, et al. Effects of different dietary levels of Enteromorpha prolifera on nutrient availability and digestive enzyme activities of broiler chickens. Chinese J Anim Nutr. 2010;22:1658–64.
17. Mediarti D, Sulaiman S, Rosnani R, et al. Pengaruh yoga antenatal terhadap pengurangan keluhan ibu hamil trimester III. J Kedokt dan Kesehat. 2014;1: 181691.
18. Jiang Q, Wu Z, Zhou L, et al. Effects of yoga intervention during pregnancy: a review for current status. Am. J. Perinatol. 2015;32:503–14.