



THE EFFECT OF PRENATAL GENTLE YOGA ON SLEEP DURATION OF PRIMIGRAVIDA PREGNANT WOMEN

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ABSTRACT

Sleep disturbances are common complaints among primigravida pregnant women due to physical, hormonal, and psychological changes during pregnancy. Inadequate sleep duration may negatively affect maternal health and fetal well-being, highlighting the need for safe and effective non-pharmacological interventions. This study aimed to examine the effect of prenatal gentle yoga on sleep duration among primigravida pregnant women in Tulungagung. A quantitative study with a one-group pretest–posttest design was conducted. The sample consisted of 53 primigravida pregnant women in the second and third trimesters who participated in a prenatal gentle yoga program, selected using a total sampling technique. Sleep duration was measured before and after the intervention using a questionnaire adapted from the Pittsburgh Sleep Quality Index (PSQI), which has been previously validated and demonstrated good reliability with a Cronbach's alpha coefficient of >0.70 . Data were analyzed using the Wilcoxon Signed Rank Test. The results showed that prior to the intervention, most participants had a sleep duration of less than five hours per night, whereas after receiving prenatal gentle yoga, nearly all participants experienced an increase in sleep duration to more than seven hours per night. Statistical analysis revealed a significant difference in sleep duration before and after the intervention ($p < 0.05$). In conclusion, prenatal gentle yoga has a significant effect on increasing sleep duration among primigravida pregnant women.

Keywords: prenatal gentle yoga; primigravida pregnant women; sleep duration

INTRODUCTION

Pregnancy is a physiological condition that begins with conception and continues until childbirth, characterized by the growth and development of the fetus within the maternal uterus. Throughout pregnancy, the maternal body undergoes a wide range of adaptations involving anatomical, physiological, hormonal, and psychological changes as responses to the increasing demands of both the mother and the developing fetus. These changes are considered normal and inevitable during pregnancy; however, in some women, they may lead to various discomforts that negatively affect overall well-being and quality of life. Anatomical adaptations during pregnancy include uterine enlargement, postural alterations, weight gain, and adjustments within the musculoskeletal system. In addition, significant physiological changes occur, such as increased blood volume and modifications in cardiovascular, respiratory, and metabolic functions. These adaptations are essential to ensure adequate oxygen and nutrient supply to support fetal growth. Nevertheless, such physiological adjustments may also influence maternal physical comfort, particularly in relation to daily activities, rest, and sleep patterns. Hormonal fluctuations during pregnancy are substantial, especially the elevation of progesterone and estrogen levels, which play a crucial role in maintaining pregnancy. At the same time, these hormonal changes can affect the central nervous system and disrupt the regulation of biological rhythms. Alterations in circadian rhythm during pregnancy are frequently associated with excessive fatigue, mood changes, and sleep disturbances. As a result, pregnant women may experience increased daytime sleepiness while simultaneously encountering difficulty achieving restful sleep at night. Sleep disturbances are among the most commonly reported complaints during pregnancy and tend to worsen

as gestational age advances. In addition to hormonal influences, progressive physical changes contribute significantly to disrupted sleep patterns. Uterine enlargement may exert pressure on surrounding organs, leading to nocturia, discomfort when lying down, and difficulty finding a comfortable sleeping position. Other common pregnancy-related symptoms, including back pain, leg cramps, lower extremity edema, and shortness of breath, further impair both sleep quality and sleep duration in pregnant women (Cunningham *et al.* 2022; Kember *et al.* 2023).

Sleep plays a crucial role in maintaining both physical and psychological balance during pregnancy. Adequate and good-quality sleep serves as a fundamental mechanism for physical recovery, emotional regulation, and immune system enhancement. Conversely, persistent sleep disturbances may lead to chronic fatigue, impaired concentration, and reduced ability to cope with stress. When left unaddressed, these conditions can adversely affect maternal health and may potentially compromise fetal well-being. From a psychological perspective, pregnancy represents a life phase that is particularly vulnerable to increased levels of anxiety and stress, especially among primigravida women. Primigravida mothers tend to experience higher levels of concern compared to multigravida mothers due to the absence of prior experience related to pregnancy, childbirth, and the transition into motherhood. The uncertainty associated with these new experiences often triggers sustained anxiety, which may negatively impact maternal mental health throughout pregnancy. Concerns experienced by primigravida women encompass various aspects, including fetal health, the anticipated childbirth process, changes in body shape and function, as well as psychological, social, and economic readiness to assume the parental role. When such concerns are not adequately managed, they may evolve into psychological stress that significantly affects overall quality of life, including sleep quality during pregnancy. The World Health Organization (WHO) reports that approximately 40–50% of pregnant women globally experience mild to moderate mental health problems, such as anxiety and stress. The WHO also emphasizes that mental health issues during pregnancy are frequently underdiagnosed and insufficiently addressed, thereby contributing to various maternal health problems, including sleep disturbances and reduced well-being. Prolonged anxiety and stress have been consistently associated with insomnia and decreased nocturnal sleep duration among pregnant women. In Indonesia, psychological disturbances during pregnancy remain a significant public health concern. Data from the Indonesian Ministry of Health indicate that more than 60% of pregnant women report experiencing anxiety and stress during pregnancy. Factors such as limited social support, inadequate access to reliable health information, and the demands of multiple roles assumed by pregnant women may further exacerbate these psychological challenges. Several national studies have also reported that approximately 60–70% of pregnant women experience sleep disturbances, including difficulty initiating sleep, frequent nocturnal awakenings, and insufficient sleep duration. Regional data suggest that sleep disturbances and fatigue among pregnant women remain prevalent in antenatal care settings, including in East Java Province. If not properly managed, sleep disturbances may increase the risk of prolonged fatigue, impaired concentration, and prenatal depression. Furthermore, insufficient sleep duration during pregnancy has been associated with an increased risk of obstetric complications, such as gestational hypertension, prenatal mood disorders, and preterm birth (Banaei *et al.* 2025; Biaggi *et al.* 2016; Kemenkes RI 2023; WHO 2022).

The management of sleep disturbances during pregnancy may involve both pharmacological and non-pharmacological approaches. However, the use of pharmacological therapy during pregnancy is limited due to potential risks to the developing fetus. Therefore, non-pharmacological interventions are generally recommended as the first-line approach for managing sleep problems in pregnant women, as they are considered safer and associated with minimal adverse effects. One widely utilized non-pharmacological intervention to address both physical and psychological complaints during pregnancy is prenatal gentle yoga. Prenatal gentle yoga is a form of physical and mental exercise specifically designed for pregnant women, combining gentle body movements, controlled diaphragmatic breathing

techniques, and relaxation or meditation practices. This intervention aims to support pregnant women in achieving a balanced state of physical comfort and psychological well-being throughout pregnancy. The movements performed in prenatal gentle yoga are adaptive to the physiological changes experienced during pregnancy and are relatively safe to practice across different gestational stages when conducted under appropriate supervision. This form of exercise has been shown to enhance muscle flexibility, improve blood circulation, and reduce physical tension commonly experienced during pregnancy. By alleviating musculoskeletal discomfort and enhancing bodily comfort, pregnant women may be better able to perform daily activities more effectively. In addition to its physical benefits, prenatal gentle yoga also exerts positive effects on maternal psychological health. Slow and controlled breathing exercises help reduce sympathetic nervous system activity while promoting parasympathetic dominance. This physiological response induces a state of calmness, comfort, and relaxation, thereby assisting pregnant women in managing anxiety and stress during pregnancy. The state of relaxation and mental centering achieved through prenatal gentle yoga plays a crucial role in preparing the body for rest. As physical and psychological tension decreases, the body becomes more receptive to initiating sleep. Consequently, sleep onset may occur more rapidly, sleep depth may improve, and overall sleep duration may become more optimal. Therefore, prenatal gentle yoga holds significant potential in improving both sleep quality and sleep duration among pregnant women ((ACOG) 2020; Azward *et al.* 2021; Chen, Yu, and Peng 2025).

Several studies have demonstrated that prenatal gentle yoga has a significant effect on improving sleep quality among pregnant women. Pregnant women who participate in prenatal gentle yoga programs show marked improvements in both sleep quality and sleep duration compared to their pre-intervention condition. Other studies have similarly reported that prenatal yoga is effective in reducing symptoms of insomnia and enhancing nighttime sleep duration during pregnancy. Evidence from studies conducted in Indonesia also supports these findings, indicating that prenatal gentle yoga is effective in improving sleep quality while simultaneously reducing anxiety levels among pregnant women. These consistent results suggest that prenatal gentle yoga serves as a beneficial non-pharmacological intervention in addressing sleep disturbances and psychological discomfort experienced during pregnancy (Azward *et al.* 2021; Chen, Yu, and Peng 2025; Wulan 2023). Nevertheless, the majority of existing studies primarily focus on overall sleep quality and do not specifically assess sleep duration, particularly among primigravida pregnant women. In addition, research examining the effects of prenatal gentle yoga on primigravida women in the Tulungagung region remains limited. Considering that primigravida women tend to experience higher levels of anxiety and face a greater risk of sleep disturbances, there is a clear need for studies that specifically investigate the effectiveness of prenatal gentle yoga in improving sleep duration within this population. Based on this gap, research exploring the impact of prenatal gentle yoga on sleep duration among primigravida pregnant women in Tulungagung is warranted. This study is expected to contribute meaningful scientific evidence to the development of safe and effective non-pharmacological interventions, while also serving as a foundation for promotive and preventive strategies aimed at enhancing both physical and psychological health during pregnancy.

METHOD

This study employed a quantitative approach using a one-group pretest–posttest design. In this design, participants received an intervention in the form of prenatal gentle yoga, and sleep duration was measured before (pretest) and after (posttest) the intervention. The design was selected to examine the effect of prenatal gentle yoga on changes in sleep duration among primigravida pregnant women without the inclusion of a control group. The study population consisted of all primigravida pregnant women who participated in prenatal gentle yoga activities at the Mother’s Movement Prenatal Yoga Studio in Tulungagung. A total sampling technique was applied, whereby all primigravida pregnant women in the

second and third trimesters who met the inclusion criteria were recruited as study participants. A total of 53 pregnant women who reported sleep complaints prior to participating in prenatal gentle yoga were included in the study. The research was conducted from September to December 2025. A pretest assessment was performed to determine baseline sleep duration prior to the prenatal gentle yoga intervention. Participants were then monitored over a one-month period to evaluate changes in sleep duration following the intervention. Prenatal gentle yoga was administered in a structured and continuous manner throughout the study period. The frequency of prenatal gentle yoga sessions varied within one month, including participation once per month, two to three times per month, and four to five times per month. Each prenatal gentle yoga session consisted of gentle physical movements, controlled diaphragmatic breathing exercises, as well as relaxation and meditation practices tailored to the condition of pregnant women. All exercise sessions were conducted with careful attention to safety and maternal comfort. The questionnaire used in this study was adapted from the Pittsburgh Sleep Quality Index (PSQI), which has been previously validated and demonstrated good reliability with a Cronbach's alpha coefficient of >0.70 ; however, only the sleep duration component was assessed. The independent variable in this study was prenatal gentle yoga, while the dependent variable was sleep duration among primigravida pregnant women. Univariate analysis was performed to describe participant characteristics, including maternal age, gestational trimester, frequency of prenatal gentle yoga participation, and the distribution of sleep duration before and after the intervention. Bivariate analysis was conducted to examine the effect of prenatal gentle yoga on sleep duration. The Wilcoxon Signed Rank Test was used as the statistical test to compare paired measurements of sleep duration before and after the prenatal gentle yoga intervention.

RESULT AND DISCUSSION

Table 1.

Age Characteristics of Pregnant Women with Sleep Disturbances Participating in Prenatal Gentle Yoga

Age	f	%
20-25 Years Old	18	34,00
26-30 Years Old	32	60,40
>30 Years Old	3	5,60

Table 1 shows that out of 53 respondents, the majority are aged between 26-30 years (60.40%).

Table 2.

Trimester of Respondents Participating in Prenatal Gentle Yoga and Experiencing Sleep Disturbances

Trimester	f	%
2	22	41,50
3	31	58,50

Table 2 shows that out of 53 respondents, the majority were in the third trimester (58.50%).

Table 3.

Frequency of Respondents Attending Prenatal Gentle Yoga in 1 Month

Frequency	f	%
Once per month	19	35,80%
Two to three times per month	14	26,40%
Four to five times per month	20	37,80%

Table 3 shows that out of 53 respondents, the majority participate in prenatal gentle yoga 4-5 times a month (37.80%). Table 4 showed that out of 53 respondents before participating in prenatal gentle yoga, the majority slept less than 5 hours per night (92.50%). Table 5 showed that out of 53 respondents, after participating in prenatal gentle yoga, the majority slept more than 7 hours per night (96.20%). Table 6 shows that prenatal gentle yoga significantly improves the sleep duration of first-time pregnant women with a p-value = 0.000 ($p < 0.05$).

Table 4.

Baseline Sleep Duration of Pregnant Women Before Prenatal Gentle Yoga Intervention

Duration	f	%
< 5 hours per day	49	92,50%
5-6 hours per day	4	7,50%

Table 5.

Baseline Sleep Duration of Pregnant Women After Prenatal Gentle Yoga Intervention

Duration	f	%
6-7 hours per day	2	3,80%
>7 hours per day	51	96,20%

Table 6.

The Effect of Prenatal Gentle Yoga on the Sleep Duration of Primigravida Pregnant Women

Statistical Test	Z	p-value
Wilcoxon Test	-6,952	0.000

Respondent Characteristics

Based on the descriptive analysis, the majority of respondents were in the 26–30 year age group, comprising 32 participants (60.4%), followed by those aged 20–25 years with 18 participants (34.0%), and those aged over 30 years with 3 participants (5.6%). This age distribution indicates that most primigravida pregnant women in the study were within the healthy reproductive age range. This period represents an early phase of adaptation to first-time pregnancy, during which physical and psychological changes are experienced more noticeably. These conditions may influence rest requirements and sleep patterns, as women are still adjusting to bodily changes and the transition into a new maternal role. Although women aged 26–30 years are generally considered to be in optimal biological condition, adaptation to substantial hormonal changes, particularly increased levels of progesterone and estrogen, may affect central nervous system function and circadian rhythm regulation, thereby influencing sleep patterns and rest needs during pregnancy. Primigravida women within the healthy reproductive age range are also more likely to experience heightened psychological responses, including anxiety and concern related to fetal health, bodily changes, and readiness for childbirth. These psychological factors may indirectly contribute to poorer sleep quality and reduced sleep duration, especially during nighttime. This finding is supported by recent meta-analytic evidence indicating that sleep disturbances during pregnancy are not solely influenced by biological age, but are more strongly associated with psychological adaptation processes, particularly in first-time pregnancies. Furthermore, experimental studies have demonstrated that mind–body–based interventions, such as prenatal yoga, are effective in assisting pregnant women of active reproductive age in managing anxiety and improving sleep quality. These findings suggest that women aged 26–30 years represent an appropriate target population for non-pharmacological interventions aimed at improving sleep patterns during pregnancy. (Hasibuan *et al.* 2024; Mislun *et al.* 2024).

Respondent characteristics based on gestational trimester indicated that the majority of participants were in the third trimester, accounting for 31 respondents (58.5%), while the remaining 22 respondents (41.5%) were in the second trimester. The third trimester represents a phase of pregnancy associated with the highest prevalence of physical and psychological complaints, particularly those related to sleep disturbances. During this stage, significant uterine enlargement increases pressure on the urinary bladder, musculoskeletal structures, and diaphragm, leading to symptoms such as nocturia, back pain, shortness of breath, and discomfort in finding an appropriate sleeping position. These physical changes directly contribute to reduced sleep duration among pregnant women. In addition to physical factors, psychological aspects in the third trimester play a substantial role in exacerbating sleep disturbances,

especially among primigravida women who begin to experience heightened anxiety related to impending childbirth and the transition into motherhood. Previous studies have shown that increased levels of prenatal anxiety during late pregnancy are significantly associated with insomnia and shortened sleep duration, thereby increasing the risk of chronic fatigue in pregnant women. Nevertheless, several interventional studies have reported that prenatal yoga practiced during the third trimester is effective in simultaneously alleviating physical discomfort and psychological distress. This effect is mediated through mechanisms such as muscle relaxation, improved blood circulation, and activation of the parasympathetic nervous system, which ultimately support improvements in both sleep duration and sleep quality among women in advanced gestational stages (Rhomadona and Primihastuti 2020; Sofiana and Tyas 2025).

Based on the frequency of prenatal gentle yoga participation within one month, the majority of respondents attended sessions four to five times per month, comprising 20 participants (37.8%). This was followed by participation once per month among 19 respondents (35.8%), and two to three times per month among 14 respondents (26.4%). This variation in participation frequency reflects real-world conditions, in which engagement in physical activity among pregnant women is influenced by factors such as time availability, physical condition, and individual motivation. Despite differences in training frequency, all respondents demonstrated an improvement in sleep duration following the intervention. This finding suggests that prenatal gentle yoga exerts a consistent therapeutic effect even when practiced at varying frequencies. Previous research has indicated that the benefits of prenatal yoga are not solely dependent on exercise intensity, but rather on the quality of practice, which includes a structured combination of gentle movements, controlled breathing, and mental relaxation. Furthermore, prenatal yoga practiced on a regular basis, even when performed only a few times per month, has been shown to reduce sympathetic nervous system activity and enhance relaxation responses. These physiological effects facilitate sleep initiation and contribute to prolonged sleep duration among pregnant women. The present findings reinforce the evidence that prenatal gentle yoga represents a practical, flexible, and effective non-pharmacological intervention for improving sleep duration among primigravida pregnant women (Farokah and Kurniasari 2024; Rhomadona and Primihastuti 2020; Sofiana and Tyas 2025).

Changes in Sleep Duration among Primigravida Pregnant Women

The assessment of sleep duration prior to the intervention revealed that the majority of respondents experienced severely insufficient sleep. A total of 49 respondents (92.5%) reported sleep duration of less than 5 hours per night, while only 4 respondents (7.5%) slept for 5–6 hours per night. These findings indicate that, before participating in prenatal gentle yoga, most primigravida pregnant women experienced significant sleep disturbances. Sleep duration of less than five hours reflects a condition of insomnia or inadequate sleep, which may adversely affect both physical and psychological health during pregnancy. Following the prenatal gentle yoga intervention, a marked improvement in sleep duration was observed. As many as 51 respondents (96.2%) reported sleeping for more than 7 hours per night, while only 2 respondents (3.8%) were in the 6–7 hour sleep category. These results demonstrate that prenatal gentle yoga had a positive effect on the ability of pregnant women to achieve longer and more optimal sleep. The increase in sleep duration to more than seven hours indicates a substantial improvement in rest compared to the pre-intervention condition. Overall, the findings show that prior to the prenatal gentle yoga intervention, most primigravida pregnant women experienced severely reduced sleep duration, with the majority sleeping less than five hours per night. This condition suggests that sleep disturbances represent a significant and serious problem among primigravida women, particularly during the early adaptation phase of first-time pregnancy. These findings are consistent with the study by (Nurul and Hafid 2023) which reported that women in late pregnancy frequently experience severe sleep disturbances due to a combination of hormonal changes, physical

discomfort, and increased anxiety, resulting in sleep duration far below physiological requirements. The extremely short sleep duration observed before the intervention reflects inadequate sleep conditions that may negatively affect physical and psychological balance during pregnancy. Research by (Islah Wahyuni 2022) explained that insufficient sleep duration in pregnant women is associated with increased chronic fatigue, impaired concentration, and emotional instability, which may worsen the overall pregnancy experience and reduce quality of life among primigravida women. Moreover, persistent sleep disturbances may impair the body's capacity for physiological recovery during pregnancy, thereby increasing the risk of pregnancy-related complications if not appropriately managed.

Following the prenatal gentle yoga intervention, this study demonstrated a highly significant improvement in sleep duration, with nearly all respondents achieving more than seven hours of sleep per night. This increase indicates that prenatal gentle yoga has a clear and positive effect on the ability of primigravida pregnant women to attain longer and more optimal sleep. These findings are consistent with the study by (Sari and Dahniar 2021) which reported that structured prenatal yoga programs are effective in improving both sleep duration and sleep quality through sustained physical and mental relaxation mechanisms. The improvement in sleep duration observed after the prenatal gentle yoga intervention can be explained by the underlying mechanisms of the exercise, which integrates gentle physical movements, regulated breathing, and relaxation techniques. This combination simultaneously reduces muscle tension and suppresses excessive sympathetic nervous system activity. The relaxation state induced during prenatal gentle yoga allows the maternal body to transition into the resting phase more easily, thereby facilitating faster sleep initiation and extending nighttime sleep duration. Research by (Nurul and Hafid 2023) further supports these findings, emphasizing that regular prenatal yoga practice promotes a stable relaxation response that helps pregnant women maintain longer and higher-quality sleep. The increase in sleep duration to more than seven hours, as observed in this study, is not only statistically significant but also clinically meaningful. Adequate sleep duration plays a vital role in maintaining metabolic balance, supporting immune system function, and promoting emotional stability during pregnancy. (Islah Wahyuni 2022) reported that pregnant women who achieve sufficient sleep duration tend to experience lower levels of fatigue and demonstrate better adaptive capacity to physical and psychological changes throughout pregnancy. Therefore, the significant changes in sleep duration before and after the intervention in this study further strengthen the evidence that prenatal gentle yoga is an effective, safe, and easily applicable non-pharmacological intervention for improving sleep duration among primigravida pregnant women. This intervention may be incorporated into promotive and preventive strategies within antenatal care services, particularly to address sleep disturbances commonly experienced during first-time pregnancies (Sari and Dahniar 2021).

Effect of Prenatal Gentle Yoga on Sleep Duration among Primigravida Pregnant Women

The analysis of changes in sleep duration using crosstabulation revealed that all respondents experienced an increase in sleep duration following the intervention. A total of 47 respondents (88.7%) who initially reported sleep duration of less than 5 hours per night showed an improvement to more than 7 hours after the intervention. In addition, all 4 respondents (7.5%) who had a baseline sleep duration of 5–6 hours also experienced an increase to more than 7 hours post-intervention. No respondents demonstrated a decrease in sleep duration or remained in the same sleep duration category. These findings indicate that all participants benefited from the prenatal gentle yoga intervention in terms of improved sleep duration. The results of the Wilcoxon Signed Rank Test further confirmed these findings. All respondents ($n = 53$) were classified as positive ranks, indicating that post-intervention sleep duration was higher than pre-intervention sleep duration for every participant. No negative ranks or ties were identified, demonstrating a consistent improvement in sleep duration across the entire sample. The Wilcoxon test yielded a Z value of -6.952 with a significance level of $p = 0.000$ ($p < 0.05$),

indicating a statistically significant difference between sleep duration before and after the prenatal gentle yoga intervention. The highest mean rank was observed in the post-intervention sleep duration group, suggesting that prenatal gentle yoga had a significant effect on increasing sleep duration among primigravida pregnant women.

The results of the crosstabulation analysis and the Wilcoxon test indicate that prenatal gentle yoga exerts a highly consistent effect on improving sleep duration among primigravida pregnant women. All respondents experienced an increase in sleep duration following the intervention, with no cases of decreased or unchanged sleep duration. These findings suggest that prenatal gentle yoga is not only statistically effective but also possesses strong clinical relevance in improving sleep patterns during pregnancy. From a medical perspective, sleep disturbances in primigravida pregnant women are often associated with neuroendocrine and autonomic nervous system imbalances that occur during pregnancy. Elevated levels of progesterone and estrogen influence sleep-regulating centers in the hypothalamus and alter circadian rhythm regulation, making pregnant women more prone to nighttime awakenings and difficulty maintaining prolonged sleep. This condition is further exacerbated by first-time pregnancy-related anxiety, muscle tension, and physical discomfort, which collectively contribute to a state of hyperarousal characterized by dominance of sympathetic nervous system activity over parasympathetic activity. Prenatal gentle yoga primarily operates through activation of the parasympathetic nervous system via a combination of gentle movements, controlled breathing, and relaxation techniques. Slow diaphragmatic breathing, a core component of prenatal yoga practice, has been shown to reduce heart rate, lower blood pressure, and decrease stress hormone levels, particularly cortisol. Reduced cortisol levels play a critical role in facilitating faster sleep onset and sustaining longer sleep duration. In addition, the slow and controlled movements characteristic of prenatal gentle yoga help alleviate skeletal muscle tension, particularly in the lower back, pelvic region, and lower extremities, which are common sources of discomfort in late pregnancy. The reduction of musculoskeletal pain directly decreases the frequency of nocturnal awakenings, allowing pregnant women to maintain non-rapid eye movement (non-REM) and rapid eye movement (REM) sleep phases more effectively. From a neurophysiological perspective, prenatal gentle yoga also influences brain wave activity. Meditation and relaxation practices incorporated into yoga increase alpha and theta wave activity, which are associated with deep relaxation and the transition toward sleep. This shift facilitates movement from a heightened state of alertness to a state of sleep readiness, thereby promoting a gradual and sustained increase in sleep duration (Field 2016; Sedov et al. 2018).

This mechanism explains why all respondents in the present study were classified as positive ranks in the Wilcoxon test, as the effects of prenatal gentle yoga operate in a systemic and consistent manner across individuals. Beyond its direct influence on the nervous system, prenatal gentle yoga also provides psychological benefits that indirectly contribute to improvements in sleep duration. Yoga practice enhances body awareness and emotional regulation, enabling primigravida pregnant women to better manage concerns related to pregnancy, childbirth, and the transition into motherhood. The reduction in anxiety is particularly important, as anxiety is recognized as one of the primary predictors of insomnia during pregnancy. A longitudinal study by (Shi and Macbeth 2017) demonstrated that yoga and relaxation-based interventions significantly reduce antenatal anxiety and exert a positive effect on sleep duration among pregnant women. The Wilcoxon test results in this study, showing a Z value of -6.952 with $p < 0.05$, indicate that the observed changes in sleep duration following the intervention were not due to random variation, but rather reflected a genuine effect of prenatal gentle yoga. The absence of negative ranks or ties further reinforces the conclusion that prenatal gentle yoga produced a universal effect across all respondents, regardless of individual characteristics. Clinically, an increase in sleep duration to more than seven hours per night represents a meaningful indicator of improved restorative rest, which may positively influence maternal health and overall adaptation to pregnancy.

Thus, from a scientific perspective, prenatal gentle yoga improves sleep duration among primigravida pregnant women through interconnected neuroendocrine, musculoskeletal, and psychological mechanisms. This intervention reduces sympathetic nervous system activity, enhances parasympathetic dominance, alleviates pain and anxiety, and facilitates physiological conditions that are conducive to longer and higher-quality sleep. Therefore, prenatal gentle yoga can be recommended as an evidence-based, non-pharmacological intervention within antenatal care services to address sleep disturbances in primigravida pregnant women.

CONCLUSION

Based on the findings and discussion of this study, it can be concluded that prenatal gentle yoga has a significant effect on improving sleep duration among primigravida pregnant women in Tulungagung. Prior to the intervention, the majority of respondents experienced severely insufficient sleep duration, indicating the presence of substantial sleep disturbances during first-time pregnancy. Following participation in a structured prenatal gentle yoga program, nearly all respondents demonstrated an increase in sleep duration to a level considered physiologically adequate. The results of the Wilcoxon Signed Rank Test showed that all respondents experienced an improvement in sleep duration after the intervention, with no cases of decreased or unchanged sleep duration, confirming that the observed differences were statistically significant. These findings indicate that prenatal gentle yoga is not only statistically effective but also clinically meaningful in improving sleep patterns among primigravida pregnant women. From a scientific standpoint, the observed increase in sleep duration can be explained by the mechanisms of prenatal gentle yoga, which include activation of the parasympathetic nervous system, reduction of stress hormone levels, muscle relaxation, and improvement in maternal psychological well-being.

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