



THE EFFECT OF THE USE OF MATERNITY PILLOWS ON THE SLEEP QUALITY OF PREGNANT WOMEN IN THE 3RD TRIMESTER

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ABSTRACT

Sleep problems are common in most pregnant women. Physical, psychological and hormonal changes make women more pregnant may suffer from sleep disorders. The impact of sleep disturbances during pregnancy has been linked to an increased risk of premature birth, small babies for gestational age, and high blood pressure. The purpose of this study is to determine the effect of the use of maternity pillows on the sleep quality of pregnant women TM III. The research method used a quasi-design non-equivalent control group experiment. This research was conducted in the city of Jambi. The sampling technique used was purposive sampling with a total sample of 30 samples, 15 experimental groups and 15 control groups. Data analysis using T-Test. The results of the statistical test showed that the p-value was $0.020 < 0.05$, so it can be concluded that there was a significant difference in sleep quality between pregnant women who were given maternity pillows and pregnant women who were not given maternity pillows.

Keywords: maternal well-being; maternity pillows; pregnancy complications; pregnant; sleep quality

How to cite (in APA style)

Rahmawati, D., & Mustikasari, Y. (2024). The Effect of the Use of Maternity Pillows on the Sleep Quality of Pregnant Women in the 3rd Trimester. *Indonesian Journal of Global Health Research*, 6(S6), 917-924. <https://doi.org/10.37287/ijghr.v6iS6.5148>.

INTRODUCTION

Pregnancy is a transitional period that involves significant physical and emotional changes. Even in easy pregnancies, these changes can occur in the quality of life of pregnant women, which has an impact on the health of the mother and baby. One of the main factors that affect the quality of life of pregnant women is helping them sleep. (Lagadec *dkk.*, 2018). Most pregnant women experience sleep problems. (Lagadec *dkk.*, 2018). Pregnant women may experience sleep problems as a result of physical, psychological, and hormonal changes. (Sedov *dkk.*, 2018)(Hashmi *dkk.*, 2016). Studies show that sleep disturbances in pregnant women are 46-78%, with sleep quality decreasing towards the third trimester. Almost 80% of pregnant women experience insomnia in the third trimester. (Hashmi *dkk.*, 2016). 98% of pregnant women who had trouble sleeping in the third trimester said they woke up at night. Changes in circadian rhythm do not affect sleep problems in pregnant women, on the contrary, melatonin levels indicate diurnal rhythm. Sleep disorders caused by hormonal changes, breathing, cardiovascular function, fetal movements, and frequent waking up to urinate due to the larger size of the uterus (Hashmi *dkk.*, 2016).

Studies show that stress, depressive symptoms, and quality of life related to physical health are all factors associated with poor sleep quality during pregnancy. (Zhang *dkk.*, 2021). Sleep disturbances during pregnancy have been linked to an increased risk of premature birth, small babies for gestational age, and high blood pressure (Zhang *dkk.*, 2021)(Tang *dkk.*, 2020). To improve sleep quality during pregnancy and support the success of Natural Childbirth, non-invasive interventions that can be achieved through exercise, one of which is prenatal gantle yoga (Rahmawati and Anjarwati, 2021).

The use of pillows for pregnant women, is an additional intervention to improve sleep quality. This pillow is specially designed and shaped to help support the enlarged body and uterus. With this pillow, pregnant women can get the best support in various sleeping positions. As time goes by, the shape of the pregnant woman's body changes. Most traditional pillows are not suitable for following the curves of the pregnant woman's body and can dispell the complaints felt during pregnancy such as having back pain, leg cramps, pelvic tension, and finally, restless nights or insomnia because of this. The pregnant woman pillow that the author uses is U-shaped, this pillow supports each part of the body evenly, allowing the legs and hips to be aligned and also supporting the neck. Other benefits of using a pregnancy pillow include feeling comfortable when adjusting to a new sleeping position, reducing tension around the hips and pubic bones, keeping both feet aligned, improving blood circulation, reducing common pregnancy conditions such as heartburn, nasal congestion, and leg cramps, avoiding accidental back rolls while sleeping. Maternity pillows are also used to correct the sleeping position on the left side. (Wyndham, 2023) In addition, pregnant women can also use maternity pillows to provide support for the mother's neck, back, and arms as well as during breastfeeding. (Mbada *dkk.*, 2013). It is essential to carry out interventions to improve sleep quality during pregnancy. The use of maternity pillows is a non-invasive and practical method to overcome this problem. (Mbada *dkk.*, 2013). Research shows that using a maternity pillow can help reduce pain scores and relieve low back pain associated with pregnancy (Weis *dkk.*, 2020).

Quality sleep is an important aspect of overall health and well-being, and it is especially important for pregnant women. Currently, the use of maternity pillows is now increasingly popular among pregnant women, especially in the third trimester. Previous research has shown that maternity pillows can provide support and comfort for pregnant women, but research on the impact of maternity pillows on sleep quality during the third trimester of pregnancy is still a matter of limited research. Existing research only highlights the relationship between sleep quality during pregnancy and factors such as stress, depression, and mental health status (Weis *et al.*, 2020)(Money *et al.*, 2022)(Zhang *et al.*, 2019). This is the basis for researchers to conduct research that focuses on assessing the sleep quality of pregnant women before and after using maternity pillows and assessing the extent of the effectiveness of maternity pillows in improving the sleep quality of pregnant women.

METHOD

This study uses an experimental methodology of non-equivalent control group design to determine the effect of the use of maternity pillows on the sleep quality of TM III pregnant women in the working area of the Pall Merah 2 Health Center during September 2024. The sample was 30 pregnant women in the third trimester. The determination of the sample using inclusion criteria includes pregnant women in the third trimester who attend classes for pregnant women in the work area of the Red Pall 2 Health Center. In contrast, the exclusion criteria involved pregnant women with pregnancy complications (e.g. hypertension, depression), pregnant women who were unable to give consent or take part in the study due to language barriers or cognitive impairment. The standard operational procedure of the intervention provided starts from the researcher collecting pregnant women in the 3rd trimester during the pregnant women's class activities. The researcher conducted a pretest measurement of the sleep quality of pregnant women in the control group and intervention using a PSQI questionnaire. Furthermore, before giving pregnant women pillows, researchers provide information through videos and materials using power points about the use of pregnant women pillows with various sleeping positions. The use of pillows for pregnant women during night's sleep every day lasts three weeks. To control the use of this pillow, the

researcher provides a useful checklist sheet that reminds pregnant women to use the pillow every night before going to bed. Researchers also actively remind the use of pillows in whatsapp groups to ensure their use by sending photos of mothers on pillows. At the end, the researcher measured the posttest sleep quality of pregnant women in the control and intervention groups.

A purposive sampling methodology is adopted to select participants based on predetermined inclusion criteria. Evaluation of the sleep quality of pregnant women before and after the intervention was carried out using the Pittsburgh Sleep Quality Index (PSQI) questionnaire, which measures the quality of deep sleep. The interval is 1 month and consists of 19 questions that measure 7 assessment components, namely subjective sleep quality, sleep latency, sleep duration, sleep habit efficiency, sleep disorders, sleep medications, and daytime dysfunction. Ethical approval for research efforts was obtained from the Health Research Ethics Committee of the University of Jambi, which was appointed with number 2392/UN21.8/PT.01.04/2024, thus confirming compliance with ethical standards in research practice. Statistical analysis mainly involves the use of T-tests to determine the effect of maternity pillows on the sleep quality of pregnant women.

RESULT

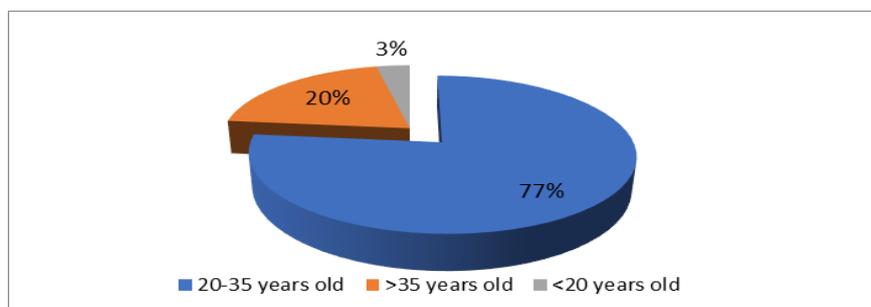


Figure 1. Characteristics of mothers by age

In this study, the results of the characteristics of the respondents of the age of pregnant women (see Figure 1) were divided into 3 groups dominated by 23 people (77%) aged 20-35 years, 6 people (20%) aged >35 years and 1 person aged <20 years (3%). The characteristics of pregnant women based on the number of pregnancies (see Figure 2) are divided into Primigravida as many as 10 people (33%), Multigravida 18 people (60%) and Grandemultigravida people (7%).

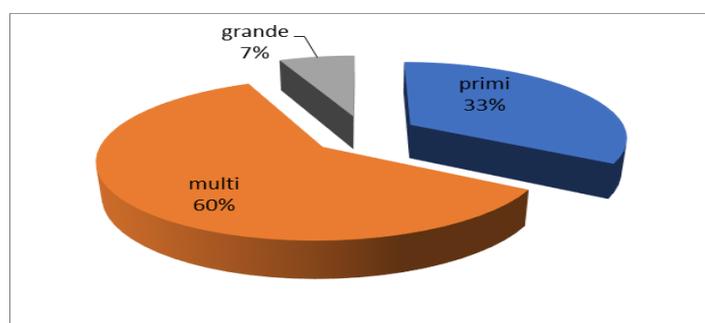


Figure 2. Characteristics of pregnant women

Figure 3 presents the change in sleep quality scores of pregnant women in the intervention group. In the intervention group, the mother's PSQI score tended to drop significantly after the use of a maternity pillow. Of the 15 pregnant women who received intervention using maternity pillows, as many as 13 pregnant women experienced a decrease in PSQI scores, which means that there was a change in the quality of mothers' sleep to be better than before.

Two pregnant women in the intervention group experienced an increase in PSQI scores, which is a marker that the mother's sleep quality did not change. Based on the results of the interview, this happened because the mother felt overheated at night and still had complaints of nausea and vomiting during pregnancy so that it interfered with the comfort of the mother's sleep at night. Pregnant women can experience significant health problems due to nausea and vomiting, which can lower their overall quality of life.

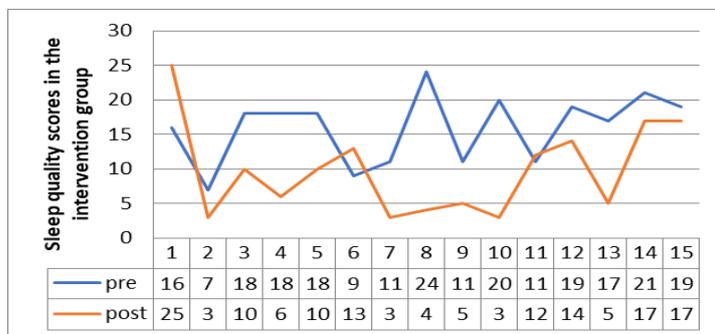


Figure 3. Distribution of Pretest and Posttest Sleep Quality Data in the Intervention Group

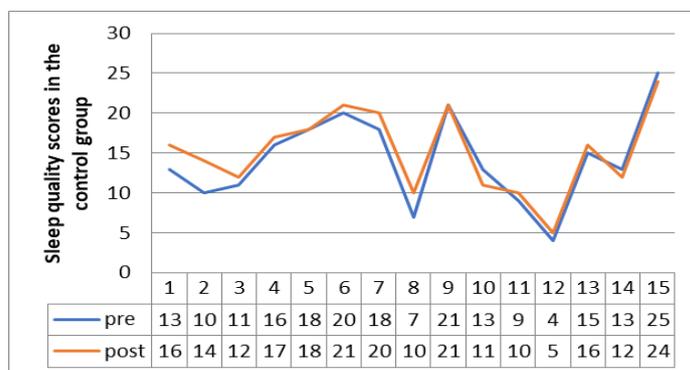


Figure 4. Distribution of pretest and posttest sleep quality data in the control group

Based on the data on the distribution of sleep quality of pregnant women in the intervention group (see figure 3), it can be seen that the calculation of the mother's PSQI score has decreased, which means that there is an improvement in the sleep quality of pregnant women after using maternity pillows. In the control group (see figure 4) that did not receive the intervention, there was an increase in PSQI scores, which means that the sleep quality of pregnant women tended to deteriorate as the pregnancy progressed.

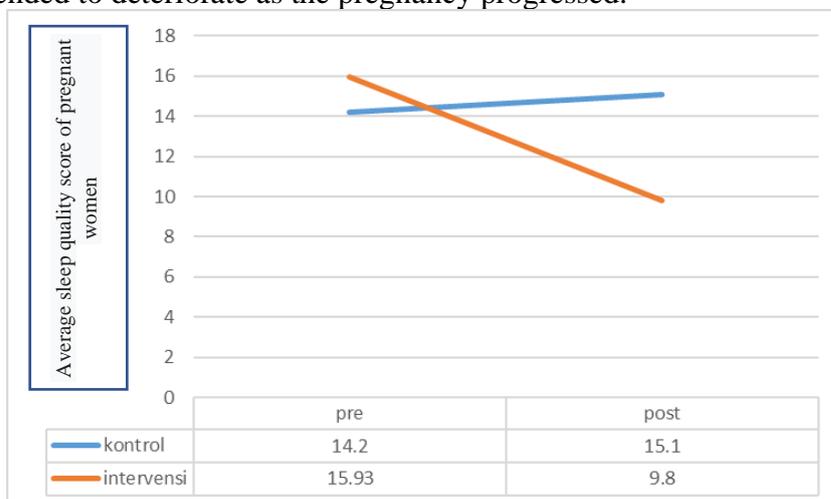


Figure 5. Comparison of sleep quality in control and intervention groups

Data on pretest sleep quality of pregnant women before the administration of maternity pillows in the intervention group, the average PSQI score was (15.93), the average posttest PSQI score for the intervention group was (9.80). The sleep quality of the control group that had been determined had an average PSQI score of (14.20), the average PSQI Posttest score of the control group was (15.13).

Table 1.
Effect of maternity pillow use on sleep quality of pregnant women

Sleep Quality	n	With	P value
Intervention	15	-2.471	0.020
Control	15		

Based on the table 1, it is known that the average sleep quality of pregnant women who use pregnant women's pillows is 2.6 with a minimum value of 0.187 and a maximum of 5.013. The results of the statistical test showed that the p-value was $0.020 < 0.05$, so it can be concluded that there was a significant difference in sleep quality between those who were given maternity pillows and those who were not given maternity pillows.

DISCUSSION

This study discusses the effect of the use of pillows for pregnant women on the sleep quality of pregnant women in the 3rd trimester. Everyone needs sleep as a physiological need. Pregnant women, in particular, need a sufficient amount of sleep to maintain the health of their fetus and to store the energy needed to give birth. (Bakouei, Lopi & Bakhtiari, 2019). Pregnancy is a process that causes significant anatomical, physiological and biochemical changes in a woman's life (Bakouei, Lopi & Bakhtiari, 2019). These changes affect women's physical and emotional behavior and can lead to sleep disturbances. One of the significant health problems during pregnancy is poor sleep quality, which can increase the risk of gestational diabetes and other pregnancy-related complications. A 2021 study found that pregnant women in China who experienced severe nausea and vomiting were associated with poor sleep quality. (Li *et al.*, 2021). Poor sleep quality can also lead to gestational hypertension, cesarean section, and premature birth. (Reichner, 2015). Pregnant women who do not sleep for six hours or less are at risk of preterm birth, preeclampsia, prolonged labor, low progesterone levels, placental abruption, miscarriage, fetal death, and low birth weight. (Volhynian-Gmaj *et al.*, 2017). Sleep problems during pregnancy account for nearly 70% of mental health conditions, including depression, suicidal ideation, and postpartum psychosis. (Moradi *dkk.*, 2021).

Based on the data on the distribution of sleep quality of pregnant women in the intervention group, it can be seen that the calculation of the mother's PSQI score has decreased, which means that there is an improvement in the sleep quality of pregnant women after using maternity pillows. This is supported by a similar study conducted by Miftahul Jannah in 2022, which found that after testing the sleep quality of pregnant women in the third trimester, the intervention group and the control group showed different results. Therefore, because there is a significant difference, it can be concluded that the use of maternity pillows for pregnant women can improve sleep quality at Akhmad Berahim Hospital, Tana Tidung Regency, pregnant women in the third trimester are sleeping. (Miftahul Jannah and Tuti Meihartati, 2022). The results of this study show that pregnant women experience significant sleep problems during pregnancy. One of the most common problems experienced by pregnant women is often waking up at night, pregnant women have difficulty falling asleep within 30 minutes and waking up to use the toilet and pregnant women are also found to have subjective snoring problems during pregnancy. These findings are supported by other research

conducted in Vietnam (Bakouei, Lopi & Bakhtiari, 2019) China (Volhynian-Gmaj *dkk.*, 2017) dan India (Venugopal, Rajendran and V., 2018).

On the other hand, the quality of sleep of pregnant women is considered very good, there are also pregnant women with a sleep duration of ≤ 7 hours per night and no pregnant women have reported using sleeping pills for the past month. The findings are also similar to other studies conducted in Denmark (Ertmann *dkk.*, 2020) Iran (Rezaei, Moghadam and Saraylu, 2013), and Vietnam (Huong, Air Swift, 2019). Mechanical factors, such as frequent urination, a very active baby, and heartburn, as well as hormonal factors, such as increased levels of oxytocin and estrogen, can cause pregnancy to experience more severe sleep disturbances. (Oyiengo *dkk.*, 2014). Pregnant women can experience mild sleep problems. Mechanical and hormonal factors can cause sleep changes during pregnancy. This may be because the body undergoes physical and mental changes during pregnancy. Some mechanical factors include leg cramps, urinary incontinence, shortness of breath, heartburn, and severe back pain. Due to an enlarged uterus, a very active baby, and worries about the baby and themselves, some women may have difficulty finding the right sleeping position. (Venugopal, Rajendran and V., 2018)(Aalrazek *et al.*, 2016). In addition, estrogen and progesterone levels actually increase during pregnancy. A growing body of evidence suggests that these hormones regulate reproductive function and affect many physiological and psychological processes, such as sleep, mood, sensory function, and cognition. (Deurveilher, Rusak and Semba, 2011). Compared to the pre-pregnancy rate, estrogen levels increase more than a hundred times and progesterone levels up to two hundred times at the end of pregnancy. Estrogen causes edema of the mucosa of the upper airway, which increases the resistance of the upper airway and causes breathing problems. The hormone oxytocin, which is responsible for uterine contractions, peaks at night, which can cause sleep fragmentation when pregnancy ends. (Oyiengo *et al.*, 2014).

The prevalence of changes in sleep quality during pregnancy ranges from 40% to 96% (20). Results of various studies It was found that factors that affect the sleep quality of pregnant women include increasing age, education, employment status, monthly income, gestational age, parity, alcohol consumption and smoking (Reichner, 2015). Pregnant women who are sleep-deprived can experience mental disorders and the fetal nervous system is very susceptible to sleep deprivation. In addition, poor sleep quality can cause learning disorders and anxiety in children. (Facco *et al.*, 2010). Pregnant women's sleep conditions that are not restful, often wake up and wake up feeling less refreshed due to hormonal and physical changes in the body. But mothers need more sleep than usual. Lack of sleep can weaken the immune system, thus increasing the risk of complications. In order to have a better rest, the use of pillows for pregnant women is recommended during sleep to improve sleep quality and reduce pain or discomfort. These pillows help with side sleep, which increases blood flow to the placenta, thus providing better oxygen and nutrition for the baby, reducing pressure on the back, hips and knees, which are common areas of discomfort during pregnancy. By reducing discomfort and improving proper alignment, pregnancy pillows help pregnant women achieve better sleep. Other things to consider to improve sleep quality include maintaining a regular sleep pattern by going to bed and waking up at almost the same time every day, limiting naps to no more than 20 minutes a day, limiting caffeine, exercising regularly but not at night, doing something calming before bed, if you don't feel sleepy or waking up at night go to another room and do calming activities (such as reading or meditate) until you feel sleepy, then try again, try to overcome anything that worries you at the beginning of the day rather than at bedtime, make sure the bedroom is comfortable (quiet, dark, not too hot or too cold), avoid screens in the bedroom and don't use screens for about an

hour before bedtime.

CONCLUSION

The results of a study in the working area of the Pall Merah 2 Health Center in 2024 show that the use of maternity pillows affects the sleep quality of pregnant women in the third trimester. The majority of pregnant women who use maternity pillows to sleep at night say that they sleep well, the feeling of insecurity or pain begins to decrease, breathing better, being able to fall asleep for 30 minutes from lying down, sleeping for more than 7 hours/night. However, there are also pregnant women who wake up at night because they have to go to the toilet and feel the heat at night in the control and intervention groups. No pregnant women reported having used sleeping pills in the past month. It is very important to inform pregnant women about the benefits and recommend the use of pregnant women pillows in pregnant women's class activities. To the health office and health center to issue operational recommendations for the use of pregnant women's pillows officially and standardized, so that the use of pregnant women's pillows can be immediately practiced during pregnant women's class activities or antenatal care, because good sleep is very important for the overall health of mothers and babies

ACKNOWLEDGEMENTS

The researcher expressed his gratitude to the Directorate General of Higher Education, Research, and Technology (Ditjen Dikristek) of the Ministry of Education and Culture for helping to fund this research and also expressed his gratitude to the Pall Merah 2 Health Center work area for giving permission and assisting the implementation of this research well.

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