

# The Relationship Between Quality of Sleep in Pregnant Women With the Incidence of Preeclampsia

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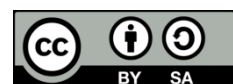
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## ABSTRACT

during pregnancy, pregnant women often have difficulty sleeping due to physical changes and stress control, and even experienced depression. The older the pregnancy, the higher the risk of sleep disorders. Several factors can cause blood pressure to be high during pregnancy, including quality sleep. Pregnancy hypertension is experienced by 8% of pregnant women which is the cause of death of mothers and neonates at risk of eclampsia and preeclampsia. High blood pressure during pregnancy can affect the quality of sleep. Insomnia is experienced by 12% of pregnant women in the first trimester and as many as 75% at the end of pregnancy. Objective: This Literature review aims to determine the relationship of sleep quality to changes in blood pressure of pregnant women resulting in the incidence of preeclampsia. Method: Flowchart database search from Google Scholar, Pubmed, and Science Direct was conducted in 2018-2023, and can be accessed for free, with the search word (((Quality Sleep) OR (pregnant women)) AND (preeclampsia\*)) OR (maternity mothers\*)) AND (blood pressure) then the selected article after the selection results are 6 articles. Result: pregnant women have poor sleep quality, especially because it also affects changes in blood pressure that tends to increase in pregnant women who have poor sleep quality, factors that affect sleep quality include stress, environment, race, age, and medical history. Conclusion: there is a relationship between the quality of sleep with changes in blood pressure in pregnant women as evidenced in pregnant women who have poor sleep quality getting the results of a systolic and diastolic increase in blood pressure, this can increase the risk of preeclampsia if not treated immediately.

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## INTRODUCTION

Sleep is a state of being unconscious and responsive to internal stimuli. Sleep experiences a passive and dormant state of life (Martini et al., 2018). Based on research conducted by Javeheri et al in 2017, it was stated that poor sleep quality, sleep disturbances, and short sleep times cause an increase in blood pressure. In adults, short sleep duration can cause metabolic and endocrine disorders which result in cardiovascular disorders which are a risk factor for hypertension (Martins et al., 2018). Various factors affect sleep quality, namely gender, disease, age, physical activity, environment physical, stress, and lifestyle. Stress and anxiety increase sympathetic activity, causing sleep disturbances (Pusparini et al., 2021) Sukorini (2017) states that most pregnant women have poor sleep quality. Hypertension (high blood pressure) is the blood pressure of adults

through the arteries that has increased from the normal state of 120/80 mmHg According to Safitri & Djaiman (2021) hypertension in pregnancy is an increase in systolic blood pressure of more than 140 mmHg and diastolic of more than 90 mmHg.

Pregnancy is a period when changes occur in all body systems, which include the cardiovascular, respiratory, hormonal, gastrointestinal, and musculoskeletal systems (Sindu, 2014). Causes of maternal death due to hypertension tend to increase by 35%, and other causes are bleeding by 17%, infection by 8%, and others by 40% (Dinkes, 2018). The prevalence of maternal deaths caused by preeclampsia is 34%. One of the symptoms of preeclampsia in pregnant women is characterized by an increase in blood pressure. Changes in blood pressure in pregnant women can be caused by changes in sleep patterns. Poor sleep quality can cause preterm birth, intra-uterine growth restriction, fetal distress, asphyxia, and meconium aspiration, and are more prone to suffer from gestational hypertension, preeclampsia, diabetes mellitus, and longer delivery time compared to pregnant women who have good sleep quality (Zaky, 2015). The bad impact of sleep on health can lead to depression, lack of concentration in activities, a distraction from verbal learning, memory disorders, speech articulation disorders, sensory disturbances, stress, motor disturbances, increased heart rate, and hypertension. Stress, depression, and hypertension occurring in pregnant women can result in premature and low birth weight babies (LBW), and preeclampsia in pregnant women can even cause abortion in infants (Pieter, 2013; Sharma, et al. 2016).

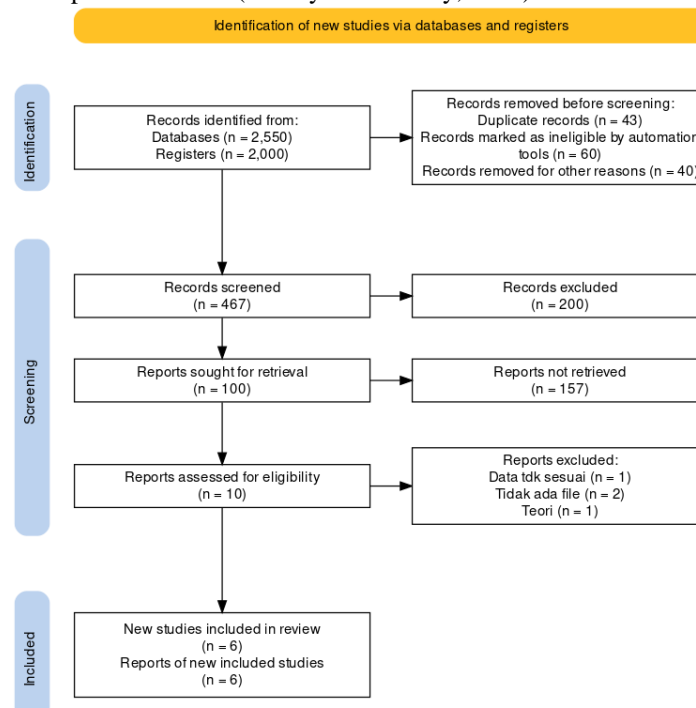
According to research (Sumarni & Sartika, 2020) that 65 respondents had poor sleep quality 37 respondents (56.9%) had good sleep quality and as many as 57 respondents (87.7%) had abnormal blood pressure Therefore, poor sleep quality can affect a person's blood pressure because there is stimulation of the sympathetic nerves which can increase blood pressure intermittently, if this goes on for a long time it can result in a persistent increase in blood pressure.

This is also supported by Putri in her research (2018) which states that blood pressure is influenced by the autonomic system, namely the sympathetic and parasympathetic. In people with poor sleep quality, there is an increase in sympathetic activity and a decrease in parasympathetic activity, which can cause an increase in blood pressure if it is chronic or long-lasting.

Literature Review This study aims to map evidence of the relationship between sleep quality in pregnant women and the incidence of preeclampsia.

**METHOD**

This study is a Literature Review whose articles are selected using the PRISMA flowchart and then compile, summarize, and report the results (Arksey & O'Malley, 2005).



**Figure 1. PRISMA Flowchart**

Database searches from Google Scholar, Pubmed, and Science Direct were conducted in 2018-2023 and can be accessed free of charge, with the search words (((((Quality Sleep) OR (Pregnant women)) AND (Preeclampsia\*)) OR (Maternity mothers \*))) AND (blood pressure) then the articles selected after the selection results totaled 6 articles with the inclusion and exclusion criteria as follows:

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
a. Original article	a. Review/comment on articles
b. Articles published in Indonesian and English	b. Articles that only discuss the quality of sleep in pregnant women
c. Articles published in the last 5 years (2018-2023) & can be accessed for free full-text d. This article discusses the relationship between sleep quality and blood pressure changes that lead to preeclampsia	c. Articles that only discuss changes in blood pressure in pregnant women

Table 2. Results of Literature Review Relationship between sleep quality and Preeclampsia

Writer	Research Title	Objective	Method	subject	Results
(Rahayu et al., 2020)	The Relationship between Sleep Quality and Changes in Blood Pressure for Pregnant Women at Midwife Nuril's Maternity Hospital	determine the relationship of sleep quality to changes in blood pressure of pregnant women at the Midwife Nuril Maternity Hospital.	The research design used was quantitative with a cross-sectional approach	The population in this study was 42 respondents. The sampling technique used was purposive sampling. The inclusion criteria were third-trimester pregnant women aged 20-35 years	The quality of pregnant sleep at the Midwife Nuril Maternity Hospital has a median of 6, the std. deviation is 1.17, the lowest score is 4 the highest is 9. The systolic blood pressure of pregnant women at the Midwife Nuril Maternity Hospital has a median of 115, the std. deviation is 10.07, the lowest systolic blood pressure is 110 the highest is 141. Meanwhile, the diastolic blood pressure of pregnant women at the Midwife Nuril Maternity Hospital has a median of 85, an std. deviation of 4.65, and the lowest diastolic blood pressure is 75, the highest is 90. There is a relationship between the quality of sleep in pregnant women and systolic blood pressure and diastolic pressure at the Midwife Maternity Hospital Nuril with p-values of 0.002 and 0.024.
(Rahayu et al., 2022)	Sleep Quality and Blood Pressure in Pregnant Women	Aims to analyze sleep quality with changes in blood pressure in pregnant women	Type research used in research in I is quantitative with approach cross-sectional	A total of 89 pregnant women were willing and met the inclusion criteria	The majority of pregnant women's sleep quality is bad with a total of 75 people (84.3%) and the minority of sleep quality is well with a total of 14 people (15.7%) minority that normal category as many as 26 people (29.2%). Pregnant women have pressure abnormal blood counts 63

					people (70.8%). While the minority 26 in the normal category people (29.2%) This matter prove that sleep quality really relate to blood pressure in pregnant women
(Georgiu, et al., 2019 )	Association of Pregestational Maternal Sleeping Disorders and Preeclampsia: A Retrospective Cohort Study and Review of the Literature	aims to evaluate sleep presence disorders before pregnancy as a risk factor for preeclampsia.	Retrospective Cohort Study and Review of literature	Group A consisted of forty-nine (49) primigravidas with ongoing normal pregnancies who agreed to participate study and Group B consisted of twenty-two women (22) with preeclampsia.	The results of this study point to a possibility individual influence of sleep disturbances on the occurrence of preeclampsia.
(Sumarni, 2020)	Relationship Between Sleep Quality and Blood Pressure in Third Trimester Pregnant Women in the Work Area of the Wado Sumedang Health Center	Aims to determine the relationship between sleep quality and blood pressure in pregnant women	This type of research is a true experiment.	65 respondents were third-trimester pregnant women	From 65 respondents, it was found that 4 respondents (14.8%) had good sleep quality with normal blood pressure, and as many as 4 respondents (10.5%) had poor sleep quality with normal blood pressure. As many as 23 respondents (85.2%) had good sleep quality with abnormal blood pressure, and 34 respondents (89.5%) had poor sleep quality with abnormal blood pressure. The chi-square results obtained Pvalue = 0.018 which is smaller than the value $\alpha = 0.05$ so $H_0$ is rejected and $H_a$ is accepted, which means that statistically there is a significant relationship between sleep quality and systolic blood pressure. good sleep has a chance of 1.478 times.
(Hidayati & Yulianti, 2023)	The Relationship between Sleep Quality and Blood Pressure in Pregnant Women at Rsi Sakinah Sooko, Mojokerto Regency	The research objective was to determine the relationship between sleep quality and blood pressure in pregnant women at	The research design used in this study uses a non-experimental research type with a correlation descriptive method	The population in this study were all pregnant women in the second and third trimesters,	Of the 107 respondents who have good sleep quality Normal blood pressure is 30 respondents (88.2%) and have good sleep quality with blood pressure as high as 4 respondents (11.8%).

		Sakinah Hospital Sooko Mojokerto.		totaling 107 people.	While those who have quality sleep bad with low blood pressure as many as 1 respondents (1.4%), which have poor sleep quality Normal blood pressure is 16 respondents (21.9%), and those who have poor sleep quality with blood pressure as high as 56 respondents (76.7%). Sperm Correlation test results with SPSS help version 16.0 shows that $\rho$ (value) = 0.000 while $\alpha = 0.05$ then $\rho$ (value) < $\alpha$ so $H_0$ rejected which reads "There is a relationship Sleep Quality With Blood Pressure For Pregnant Women at RSI Sakinah Sooko Mojokerto Regency.
(Hasanah et al., 2022)	The Relation of Sleep Quality in Pregnant Mothers with The Incidence of Preeclampsia	This study aims to determine the relationship between sleep quality of pregnant women with the incidence of preeclampsia in Gambiran Hospital Kediri	Analytic survey with a cross-sectional study	From 32 population, 30 samples determined by Issac and Michael's formula then 15 normal pregnancies and 15 preeclamptic pregnancies selected by successive sampling technique	shows that there are 15 normal pregnant women who almost all have good sleep quality (73.3%) and the rest (26.7%) had poor sleep quality. Meanwhile, out of 15 pregnant women with preeclampsia, only some (20%) have good sleep quality and most (80%) have poor sleep quality. Chi-Square results show the value of $\chi^2_{count} = 8.56$ . According to the Chi-Square value tabulation, if $df = 1$ and $\alpha = 0.05$ then the value of $\chi^2_{table} = 3.841$ . The comparison result is $3.841 < 8.56$ shows that $H_0$ is rejected and $H_a$ is accepted. This means that there is a relationship between sleep quality in pregnant women mothers with the incidence of preeclampsia at Gambiran Hospital, Kediri.

## DISCUSSION

Based on 6 articles it shows that pregnant women have poor sleep quality, in particular, it also affects changes in blood pressure which tends to increase in pregnant women who have poor sleep quality. Factors that affect sleep quality include stress, environment, race, age, and history of health (Kathryn, 2017). Several studies say that short sleep time is associated with poor pregnancy status (Facco, 2010; Williams, 2010).

This is in line with (Zaky, 2015) that changes in blood pressure in pregnant women can be caused by changes in sleep patterns. Poor sleep quality can cause preterm birth, intra-uterine growth restriction, fetal distress, asphyxia, and meconium aspiration, and are more prone to suffer from gestational hypertension,

preeclampsia, diabetes mellitus, and longer delivery times compared to pregnant women who have good sleep quality and proven by research (Rahayu et al., 2020) which states that quality pregnant women's sleep at the Midwife Nuril Maternity Hospital had a median of 6, an std. deviation of 1.17, and the lowest score was 4, the highest was 9. The systolic blood pressure of pregnant women at the Midwife Nuril Maternity Hospital had a median of 115, an std. deviation of 10.07, the lowest systolic blood pressure was 110 the highest was 141. Meanwhile, the diastolic blood pressure of pregnant women at the Midwife Nuril Maternity Hospital has a median of 85, an std. deviation of 4.65, and the lowest diastolic blood pressure is 75, the highest is 90. There is a relationship between the quality of sleep in pregnant women and systolic blood pressure and diastolic pressure at the Midwife Maternity Hospital Nuril with p-values of 0.002 and 0.024.

And according to research (Rahayu et al., 2022) in the journal "Sleep Quality and Blood Pressure in Pregnant Women" states the majority of pregnant women's sleep quality is bad with a total of 75 people (84.3%) and a minority of sleep quality is good with a total of 14 people (15.7%) a minority in the normal category are 26 people (29.2%). Pregnant women have abnormal blood pressure with a total of 63 people (70.8%). While the minority in the normal category was 26 people (29.2%). This proves that sleep quality is closely related to blood pressure in pregnant women.

This is in line with Wendy (2010) stated that continuous sleep disturbances will result in physiological changes in the body in the form of an imbalance in the body's homeostasis. If this happens, the sympathetic nervous system will be activated by the hypothalamus as an effect of an imbalance in the body's homeostasis. So that the sympathetic nervous system is active, it will result in an increase in peripheral resistance and an increase in cardiac output which can result in increased blood pressure which causes the risk of preeclampsia. So it can be concluded that someone who has poor sleep quality will experience changes in blood pressure.

Then the results of research from (Hasanah et al., 2022) in the journal "The Relation of Sleep Quality in Pregnant Mothers with The Incidence of Preeclampsia" showed that there were 15 normal pregnant women who almost all had good sleep quality (73.3% ) and the rest (26.7%) had poor sleep quality. Meanwhile, out of 15 pregnant women with preeclampsia, only some (20%) had good sleep quality and most (80%) had poor sleep quality. This means there is a relationship between sleep quality and the incidence of preeclampsia.

Based on the results above, the authors assume that there is a relationship between the quality of sleep in pregnant women and the incidence of preeclampsia, because the quality of sleep affects changes in blood pressure which tend to increase and if it persists will result in the occurrence of preeclampsia, therefore midwives need to help clients deal with this problem with one of Non-pharmacological management that can be given to pregnant women with high blood pressure due to poor sleep quality is through physical exercise. Prenatal gentle yoga which is done regularly starting from the recommended gestational age of 20 weeks can provide a sense of comfort, reduce stress, overcome back pain, and provide better sleep quality.

## CONCLUSION

There is a relationship between sleep quality and changes in blood pressure in pregnant women as evidenced in pregnant women who have poor sleep quality results in an increase in systolic and diastolic blood pressure, so this can increase the risk of preeclampsia if not treated immediately.

## Suggestion

Midwives play a role in providing complementary care for sleep disorders in pregnant women to reduce the risk of preeclampsia.

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