

Effectiveness of an Application-Based Health Promotion Program on Prenatal Yoga for Pregnant Women

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ABSTRACT

Background: Sleep disturbances are reported by approximately 78% of pregnant women in the United States, a figure significantly higher than in the pre-pregnancy period. Fatigue is a common complaint among expectant mothers, particularly during the third trimester. On average, pregnant women wake up between 3 to 11 times each night, with less than 2% experiencing uninterrupted sleep. In Indonesia, the prevalence of sleep disorders among pregnant women reaches about 64%. Furthermore, 65% of pregnant women with sleep apnea tend to deliver via cesarean section, and around 42% develop preeclampsia. This study aimed to evaluate the effectiveness of health promotion through prenatal yoga delivered via a web-based application for pregnant women. **Method:** A quasi-experimental method was used, employing a one-group pre-test and post-test design. The study took place in the working area of Amurang Health Center, South Minahasa Regency, from April to September 2023, involving 35 pregnant women in their third trimester. The participants were selected using accidental sampling. Data were collected through direct observation using a knowledge questionnaire (3 items) and the Pittsburgh Sleep Quality Index (PSQI) questionnaire (7 components). Data were analyzed using univariate and bivariate methods, with the Wilcoxon Signed Rank Test applied for statistical testing. **Results:** The findings indicated a significant improvement in sleep quality among third-trimester pregnant women after participating in the prenatal yoga sessions via the web application ($P\text{-value} < 0.001 < 0.05$). **Conclusion:** The promotion of prenatal yoga through a web-based platform is effective in enhancing sleep quality in third-trimester pregnant women. It is recommended that pregnant women continue practicing prenatal yoga at home twice every two weeks using the application.



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INTRODUCTION

Nationally, Indonesia has seen a reduction in its Maternal Mortality Rate (MMR), dropping from 305 to 189 deaths per 100,000 live births. This represents a substantial improvement and is notably lower than the 2022 target of 205 deaths per 100,000 live births. The goal for 2024 is to reach 183 deaths per 100,000 live births, with a long-term target of fewer than 70 deaths per 100,000 live births by 2030. According to the 2016 Sample Registration System (SRS) by the Health Research and Development Agency (Litbangkes), the leading causes of maternal death were hypertension (33.07%), obstetric hemorrhage (27.03%), and non-obstetric complications (15.7%). Meanwhile, data from the Maternal Prenatal Death Notification (MPDN) as of

September 21, 2021, identified the top three causes as eclampsia (37.1%), bleeding (27.3%), and infection (10.4%), with the majority of maternal deaths (84%) occurring in hospitals (Rusdiarti, 2023)

Survey findings indicate that during the COVID-19 pandemic, access to health services—including maternal and child health (MCH) and family planning—experienced a decline. This reduction in access has been associated with increased health risks, such as a rise in morbidity and unintended pregnancies, which may contribute to higher maternal and child mortality rates. A major challenge is the lack of comprehensive data regarding the negative impact of the pandemic on MCH, family planning, and nutrition services across different regions. Even under normal circumstances, these areas remain significant public health challenges in Indonesia, and the pandemic has further exacerbated the situation by limiting both access to and the quality of essential services . The government has shown its commitment to reducing maternal and infant mortality by designating 120 regencies and cities as priority areas for targeted intervention in 2020. This initiative was formalized through the Decree of the Minister of Health of the Republic of Indonesia No. HK.01.07/MENKES/94/2020, which outlines the designation of special locations for efforts aimed at lowering Maternal Mortality Rates (MMR) and Infant Mortality Rates (IMR) (PKMK FK UGM, 2020)

According to research by the National Sleep Foundation, 97.3% of pregnant women in their third trimester frequently wake up at night, typically between 3 to 11 times per night. Survey data also indicate that 78% of pregnant women in the United States experience sleep disturbances, while only 1.9% report uninterrupted sleep during this stage of pregnancy. In Indonesia, the prevalence of sleep disorders among pregnant women is also notably high, at approximately 64%. Among those affected by sleep apnea, 65% are compelled to deliver via cesarean section, and around 42% develop preeclampsia (Safriani, 2021). Sleep disturbances are experienced by approximately 78% of pregnant women in the United States, a figure significantly higher compared to the pre-pregnancy period. Fatigue is commonly reported, particularly during the third trimester. Sleep plays a crucial physiological role by influencing the nervous system and various bodily functions. It helps restore normal activity and maintains the balance within the nervous system. Additionally, melatonin levels in the body play an important role in regulating sleep, supporting natural detoxification processes within the body (Wulandari, 2022).

To address this challenge, mobile health (m-health) can be utilized as an innovative form of electronic health, serving as a tool for recording and reporting within health programs. The effectiveness of information and communication technology depends on the value it offers to its users—not only as a source of entertainment, but also as a means to enhance knowledge and deliver important information. Mobile Health Technology, or m-health, refers to the use of mobile devices to support health-related objectives, particularly for pregnant women. Access to proper antenatal care is crucial during pregnancy. Health promotion through education can be effectively delivered via smartphones, providing pregnant women with guidance on managing warning signs, practicing prenatal yoga, and performing back massages during the third trimester—all from the comfort of their homes (Nurazizah, Hastuti A *et al.*, 2023)

According to a study by Mafruha A (2017) on the impact of mobile phone messaging on maternal and child health behaviors in Bangladesh, low-cost mobile messaging can significantly influence positive health practices, such as delaying the first bath of newborns, particularly in low-resource settings. Mobile text messaging services have shown potential in expanding the reach of recommended antenatal care

(ANC) practices. Furthermore, health messages delivered via smartphones can positively impact maternal and child health behaviors by promoting better awareness and adherence to health recommendations (Selvia.A, 2019).

As we move into the 21st century, the world is witnessing rapid advancements in information technology, often referred to as the digital era or digital transformation. In this era, staying current with technological progress requires access to up-to-date smartphones or digital devices (Bayuningsih and Ilahi, 2023). The advancement of technology has made work easier and more practical for humans. The rapid development of current technology drives industry players to create various innovations in tech products, one of which is the smartphone. Smartphones are communication devices with numerous features that perform almost the same functions as computers. They are no longer limited to making calls or sending text messages; smartphones can now be used to access information from multiple sources, communicate through social media, listen to music, play games, and store a variety of data (Daniel *et al.*, 2022)

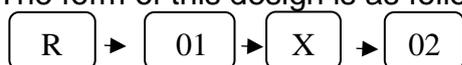
The usage of smartphones in Indonesia is expected to keep growing. In 2015, only 28.6% of the population owned these devices. Over time, as smartphones became more affordable, their usage increased. By 2018, more than half of the population, or 56.2%, were using smartphones. This figure rose to 63.3% the following year. By 2025, it is projected that at least 89.2% of Indonesia's population will own smartphones. Since 2019, smartphone usage in the country has grown by 25.9% (Pusparisa, 2020).

According to interviews with 10 pregnant women, only one had ever encountered yoga for pregnancy. Currently, the primary use of smartphones is for viewing, reading, and watching videos. The widespread use of smartphones among pregnant women for searching for information presents a significant opportunity to spread health-related knowledge, which could help reduce maternal health disparities. The aim of this study was to assess the effectiveness of promoting prenatal yoga to pregnant women through website applications.

METHODS

This study employed a quasi-experimental design using a one-group pre-test and post-test approach. It was conducted in the Amurang Health Center area, South Minahasa Regency, from April to September 2023, with a sample of 35 third-trimester pregnant women who received Prenatal Yoga Health Promotion via a web application and were evaluated two weeks later. Statistical analysis was performed using SPSS with the Wilcoxon signed rank test. The sampling method used was accidental sampling. The data analysis in this study included both univariate and bivariate analyses. Data collection was done through direct observation, a knowledge questionnaire, and a sleep quality assessment using the Pittsburgh Sleep Quality Index (PSQI).

The form of this design is as follows:



The variables in this study include the independent variable, which is Prenatal Yoga Health Promotion for Pregnant Women and Prenatal Massage, and the dependent variable, which is Sleep Quality.

The study underwent an ethical review process at the Health Research Ethics Commission of the Health Polytechnic of the Ministry of Health in Manado and received ethical approval under no. KEPK.01/07/101//2022.

RESULT

Table 1. The characteristics of the respondents

Characteristic	n	%
Age		
<20 Years	3	8.57
20 – 35 Years	30	85.71
>35 Years	2	5.71
Education		
Elementary/ Middle	15	42.8
Highschool	18	51.4
Higher education	2	5.7
Employment		
Work	18	51.4
Do not work	17	48.5
Gravida		
Primigravida	10	28.6
Multigravida	25	71.4

According to the research results presented in Table 1, most of the respondents were between the ages of 20-35 years, totaling 30 respondents (85.7%). There were 3 respondents (8.6%) under the age of 20, and 2 respondents (5.7%) were over 35 years old.

In terms of educational background, the majority of participants had completed high school, with 18 respondents (51.4%). Twelve respondents (34.3%) had attended junior high school, 3 respondents had attended elementary school, and 2 respondents had completed higher education (5.7%).

Regarding employment status, most of the respondents were housewives, with 18 (51.4%) being working mothers and 17 (48.5%) being non-working mothers. As for gravida, 25 respondents (71.4%) were multiparous (having had multiple pregnancies), while 10 respondents (28.6%) were primigravida (having their first pregnancy).

Table 2 Respondents' Frequency Distribution

Variables	n	%
Implementation of Prenatal Yoga		
Ever	0	0
Never	35	100
Difficulty Sleeping		
Yes	35	100
No	0	0

Based on table 2, most respondents have never applied Prenatal Yoga during pregnancy 35 (100%) and all pregnant women have difficulty sleeping 35 (100%)

Table 3. Distribution of respondents by sleep quality among pregnant women in the third trimester

Sleep Quality	Pre	%	Post	%
Good	7	20	30	87.7
Bad	28	80	5	14.4

The quality of sleep of pregnant women before Prenatal Yoga Health Promotion, in Pregnant Women through Web Application is less 28 (80%) and after being given Prenatal Yoga Health Promotion, in Pregnant Women through Web Application most respondents can be more relaxed so that the quality of sleep of pregnant women is better 30 (87.7%)

Table 4. The distribution of respondents based on their knowledge of prenatal yoga.

Knowledge	Before		After	
	n	%	n	%
Good	19	54.3	22	62.8
Less	16	45.7	13	37.2

Based on table 4. Most respondents already know about the meaning of Prenatal massage 19 (54.3%) and after being given Prenatal Yoga Health Promotion, in Pregnant Women through the Web Application there was an increase in knowledge about the meaning of Prenatal Yoga 22 (62.8%)

Table 5. The frequency distribution of respondents' knowledge regarding the benefits of prenatal yoga.

Benefit	Pre		Post	
	n	%	n	%
Yes	10	28.6	19	54.3
No	25	71.4	16	45.7

Based on Table 5. Most respondents do not know the benefits of Prenatal Yoga for pregnant women in the third trimester, one of the benefits is to improve the quality of sleep for pregnant women 25 (71.4%) and after being given Prenatal Yoga Health Promotion, in Pregnant Women through the Web Application most 19 (54.3%) already know the benefits of Prenatal Yoga for pregnant women.

Table 6. The frequency distribution of the impact of prenatal yoga exercises among respondents

Impact	Pre		Post	
	n	%	n	%
Yes	16	45.7	28	80.0
No	19	54.3	7	20.0

In Table 6, most respondents did not know about the impact of Prenatal Yoga for pregnant women 19 (54.3%) and after being given Prenatal Yoga Health Promotion, for Pregnant Women through the Web Application, most respondents already knew the impact of Prenatal Yoga 28 (80%).

Table 7. The Shapiro-Wilk normality test of prenatal yoga in relation to sleep quality in pregnant women during the third trimester

Variables	Shapiro Wilk		Details
	Statistics	P Value	
Sleep Quality before Prenatal Yoga	0.435	0.000	Abnormal
Sleep Quality after Prenatal Yoga	0.524	0.000	Abnormal

According to Table 7, the normality test in this study was conducted using the Shapiro-Wilk Test, as the data sample was less than 50. The results of the normality test on the sleep quality of pregnant women before and after Prenatal Yoga show that the calculated p-value from the Shapiro-Wilk test is 0.000, which is less than 0.05, indicating that the data is not normally distributed. Therefore, a non-parametric test, specifically the Wilcoxon test, was used.

Table 8. The Wilcoxon Signed Ranks Test was conducted to compare the results before and after the implementation of Prenatal Yoga

Variables	(n)	Mean	Difference	P-value
Sleep Quality before Prenatal Yoga	35	1.23	0.66	0.000
Sleep Quality after Prenatal Yoga	35	1.89		

Table 8 illustrates that the average sleep quality score of pregnant women before participating in Prenatal Yoga was 1.23, which increased to 1.89 after the intervention. This indicates a notable improvement in sleep quality, with a difference of 0.66. The results of the Wilcoxon non-parametric test revealed a p-value of 0.000, which is less than 0.050. These findings confirm that Prenatal Yoga is effective in enhancing the sleep quality of third-trimester pregnant women.

Table 9. The results of the Wilcoxon Signed Rank Test indicate the effectiveness of Prenatal Yoga on improving the sleep quality of pregnant women in the third trimester.

Variables	Z	P Value
Prenatal Yoga Health Promotion, for Pregnant Women through Web Applications	- 2,731	0.006

Table 9 presents the results of the bivariate analysis using the Wilcoxon test, where the Z value was -2.731 and the p-value was 0.000 ($\alpha = <0.05$). This indicates that the alternative hypothesis (H_a) is accepted, and the null hypothesis (H_0) is rejected. Consequently, it suggests that sleep quality improves among third-trimester pregnant women after participating in Prenatal Yoga.

Table 10. The analysis of respondent knowledge before and after receiving Prenatal Yoga health promotion through website applications for pregnant women showed a comparison of their understanding before and after the intervention

Variables	Mean	SD	P.Value
Knowledge			
Before	0.029	0.126	0.822
After			
Benefit			
Before	0.371	0.547	<0.001
After			
Impact			
Before	0.343	0.482	<0.001
After			

According to Table 10, the significance value (2-tailed) for knowledge is 0.822 ($p > 0.05$), indicating that there was no change in the results between the pre-test (before) and the post-test (after) following Health Promotion through the yoga exercise

application. Descriptive statistics show that the pre-test value was higher, with a p-value of 0.822, suggesting no difference in the knowledge of pregnant women before and after receiving health promotion via the prenatal yoga website application. In contrast, Table 8 also shows that the significance value (2-tailed) for the benefits is 0.000 ($p < 0.05$), meaning there were significant changes between the pre-test and post-test results. Descriptive statistics for both the pre-test and post-test confirm that the post-test value was higher, indicating an impact on pregnant women's interest in Health Promotion through the yoga application. For the impact of Health Promotion, the significance value (2-tailed) is also 0.000 ($p < 0.05$), indicating significant changes between the pre-test and post-test. Descriptive statistics show that the post-test score was higher, suggesting that yoga is a beneficial and safe exercise for both mother and fetus. Prenatal yoga, as a form of non-pharmacological therapy, can help alleviate pregnancy-related discomfort.

In the third trimester, yoga serves as an effective way to reduce back pain and support a safe and comfortable childbirth. It also functions as an educational tool and a means of discussion, providing pregnant women with the resources to independently manage the back pain they experience (Moneca Diah Listiyaningsih *et al.*, 2023)

DISCUSSION

Based on a study conducted on 35 respondents, a PSQI questionnaire with 7 parameters was used to assess sleep quality, while a knowledge questionnaire with 3 questions was used to measure respondents' understanding of Prenatal Yoga, including its definition, benefits, and impact on pregnant women. Before receiving Prenatal Yoga Health Promotion through the Web Application, the sleep quality of pregnant women was rated below 28 (80%). After participating in the Prenatal Yoga Health Promotion via the Web Application, most respondents reported feeling more relaxed and comfortable, leading to an improvement in their sleep quality, with 30 respondents (87.7%) showing better sleep. This finding aligns with Saleha's research (2023), which indicated that the improvement in sleep quality from poor to good was attributed to the positive energy generated by Prenatal Yoga movements, helping to unify the body and mind, making the body more relaxed, refreshed, and calm (Saleha RI, Muawanah S, Purnomo MZ, 2024).

Sleep quality consists of 7 parameters, namely subjective sleep quality, sleep latency, length of sleep at night, sleep efficiency, disturbances during sleep at night, use of sleeping pills and disruption of daytime activities according to Busyue *et al.*, 1989 in (Hami, Tasalim and Putra, 2021) Before starting Prenatal Yoga, almost all components showed a decline, with the highest average observed in parameter 5, which measures disturbances during sleep at night. After participating in Prenatal Yoga, improvements in sleep quality were observed with sessions held twice a week. This was supported by the seven sleep quality parameters, each showing smaller values after the intervention. The researchers found that the quality of sleep in pregnant women during the third trimester improved because they felt more relaxed, comfortable, calm, and at peace following the Prenatal Yoga sessions. However, in parameter 5, some disturbances, such as waking up to go to the bathroom, still occurred during the night

Knowledge about discomforts during pregnancy in the third trimester, including their causes and treatments, as well as knowledge of Prenatal Yoga, helps bridge the gap between study results and theoretical understanding. Most pregnant women have acquired information about Prenatal Yoga. This information forms the foundation of their knowledge, with health workers being the primary source of information during

pregnancy check-ups. Health workers, being viewed as experts, are trusted by the public to provide reliable health information (Rahayu.D.T., 2023). Several factors influence knowledge. The first is education; pregnant women with higher education tend to have better knowledge. The second factor is employment; pregnant women focused on their work may neglect their health. The third is age; older pregnant women are more likely to have better knowledge due to their life experience. The fourth factor is gender; generally, pregnant women are more proactive in seeking information about their pregnancy health than men. The fifth is the environment, including friends and healthcare providers who help spread knowledge about antenatal yoga. The sixth factor is socio-culture, which shapes norms and provides social support for pregnant women to engage in antenatal yoga (Sugesti et al., 2023).

Based on the explanation above, there is no discrepancy between the research and the theory, as the information received by pregnant women enhances their knowledge about Prenatal Yoga. Knowledge is the outcome of awareness, which occurs after individuals perceive a particular subject or concept (Gustina.I., 2020). According to the results of this study, prior to receiving Prenatal Yoga Health Promotion through the Web Application, most pregnant women in the third trimester were familiar with the concept of Prenatal Massage (54.3%). After receiving the Prenatal Yoga Health Promotion, there was an increase in their understanding of Prenatal Yoga, with 62.8% now aware of its meaning. However, the majority of respondents initially did not understand the benefits and impacts of Prenatal Yoga for pregnant women in the third trimester. Before the promotion, 71.4% of respondents were unaware that Prenatal Yoga could improve sleep quality for pregnant women. After the intervention, 54.3% of the respondents understood the benefits of Prenatal Yoga. This study suggests that by utilizing the Prenatal Yoga web application, pregnant women can perform the exercises at home twice a week for two weeks.

The website includes Prenatal Yoga movements, definitions, benefits, and impacts. Factors such as age, education level, and parity can influence the occurrence of unwanted pregnancies in couples of childbearing age. The ideal age for pregnancy is between 20-35 years, as this is when a woman's reproductive organs are fully developed (Purborini and Rumaropen, 2023). The ideal age for healthy reproduction is between 20 and 35 years. The risks associated with pregnancy increase for women under 20 and over 35 years old. Young pregnant women face several risks, including miscarriage, premature birth, low birth weight, congenital abnormalities, increased susceptibility to infections, anemia, pregnancy complications (gestosis), and even death. The age of the pregnant woman also affects the type of delivery at RSUD Dr. H. Abdul Moeloek in Lampung Province. Pregnant women in the high-risk age groups (under 20 and over 35 years) are twice as likely to experience abdominal deliveries compared to those in the non-risk age group (20 to 35 years) (Rani and Sari, 2020)

Currently, social changes within women's groups are gradually evolving, driven by the belief in gender equality. Housewives no longer wish to be labeled as jobless and are now more empowered to leave the home and contribute to earning a living. Research shows that working women play a significant role in supporting the family's economic needs, with their contribution to the family income accounting for 40-60% of the total household income (Tenda, Tumengkol, S. M., & Kawung, 2020). The research findings indicated that the majority of the respondents were working pregnant women, with their employment status categorized as either working or not working. Housewife pregnant women tend to have a high level of daily activities, which means they may not receive sufficient information about prenatal yoga. In contrast, working pregnant women generally have a higher social standing and, therefore, greater access to

information. Physical activity in the third trimester helps alleviate discomfort and anxiety in pregnant women, with prenatal yoga contributing to both physical and mental well-being. The low participation in prenatal yoga is primarily due to the level of knowledge among pregnant women. This can be attributed to the inadequate education provided by health workers and the scarcity of health facilities offering prenatal yoga programs (Sulistyaningsih Prabawati, Rica Purwandari and Lusa Rochmawati, 2022).

Throughout pregnancy, women undergo various internal changes that can lead to discomfort, affecting their psychological and emotional well-being. One effective way to alleviate discomfort and enhance comfort during pregnancy is through exercise, as it is essential for pregnant women to maintain a healthy and fit body (Hayati N, 2021). One form of exercise that is both beneficial and safe for the health of both the mother and fetus is yoga. Prenatal yoga is a type of non-pharmacological therapy that can help alleviate pregnancy-related discomfort. It is particularly effective in relaxing the muscles around the spine, reducing discomfort. As a non-conventional therapy, prenatal yoga falls under treatments aimed at improving public health, which includes efforts to enhance, prevent, and cure illnesses, as well as restore health. These treatments are based on structured education, ensuring high quality, safety, and effectiveness, all grounded in biomedical science, though not yet fully accepted in conventional medicine (Geawanty, R. A., Rohaya, & Novita, 2021). Yoga exercises have become increasingly popular for improving the health of pregnant women. Due to the potential side effects of medications on the fetus, pregnant women should avoid taking any drugs without guidance from an obstetrician (Rong, L., Dai, L. J., & Ouyang, 2020)

Pregnant women in the second and early third trimesters often experience discomfort due to the physiological and psychological changes that occur during pregnancy. Therefore, it is important to find ways to alleviate the discomfort they feel. Prenatal yoga is a gentle exercise that can help relax the body and is suitable for pregnant women in their second and third trimesters. The gentle yoga movements help to stretch joints and calm the mind. Mothers can practice yoga at home or attend specialized yoga classes for pregnant women. Each yoga movement offers specific benefits for both the mother and the fetus. However, there is still a lack of proper and effective awareness about Prenatal Yoga in the community for pregnant women (Rossita, Sari and Putri, 2023).

Pregnancy yoga is an exercise that enhances physical fitness while also contributing to psychological and emotional well-being. It has several positive effects on pregnant women, including reducing stress, alleviating anxiety, relieving pregnancy-related pain and discomfort, as well as helping to ease labor pain (Suarni, Hutahaean and Sofiyanti H, 2023). The implementation of Yoga for Pregnant Women across the first, second, and third trimesters, through counseling, pre-experimental design, demonstrations, and evaluations, aims to enhance pregnant women's knowledge. This will empower them to practice yoga independently at home, with the goal of maintaining their health, preparing for childbirth in a healthy manner, and alleviating the discomforts commonly experienced during pregnancy (Asiyah, Susanti and Aprilani, 2022).

Prenatal Yoga is a form of yoga specifically developed for pregnant women, with movements and intensity levels adapted to suit their physical and emotional needs, as well as those of the developing fetus. It serves to prepare expectant mothers holistically—physically, mentally, and spiritually—for the birthing process. Despite its many benefits, Prenatal Yoga remains less well-known than other pregnancy exercise programs. This limited popularity is largely due to insufficient awareness among

pregnant women, minimal promotion by healthcare professionals, and a lack of accessible Prenatal Yoga facilities in health service settings (Aryani, 2023).

The results of this study emphasize the various physical and emotional changes that occur during pregnancy, which often lead to stress and anxiety—especially in first-time mothers (primigravida). While these emotional responses are common, persistent or unmanaged stress can have adverse effects on both the mother and the developing fetus. Anxiety during pregnancy is frequently linked to hormonal fluctuations and concerns about the upcoming childbirth process. If not addressed appropriately, it may interfere with fetal well-being. Engaging in physical activity has proven effective in reducing anxiety and its associated symptoms during pregnancy. Researchers have found that prenatal yoga, in particular, helps lower cortisol (a stress hormone) levels and boosts endorphin production, promoting feelings of relaxation and emotional balance. This form of exercise can be practiced independently at home, and targeted health promotion strategies should be implemented to encourage pregnant women to use prenatal yoga as a method to manage anxiety (Apriani et al., 2021). In addition to its calming benefits, prenatal yoga can enhance flexibility, strengthen muscles, and improve overall quality of life. However, based on the analysis of pre-test (before) and post-test (after) data following health promotion through the yoga application, no significant change was observed. Descriptive statistics indicated that pre-test scores were higher, and the post-test yielded a p-value of 0.822. These findings suggest that there was no statistically significant difference in the knowledge levels of pregnant women before and after receiving health promotion through the prenatal yoga website application.

Based on pretest and posttest descriptive statistics, it was proven that the interest point in the final test was high. Interest, a tendency to behave, which is oriented towards certain objects, activities or experiences, and the intensity is different between one individual and another. Interest is the awareness of pregnant women to take part in prenatal yoga. Without this awareness, there will be no interest in exercising. In this study, many pregnant women had sufficient interest (72.7%) with the same number of sufficient levels of knowledge. This is in accordance with the theory of knowledge, the result of a person's knowledge of objects through their senses. Knowledge plays an important role in determining attitudes and actions. From the knowledge that the mother has, the mother will think and intend (tendency to act) to take part in prenatal yoga, the mother's sufficient knowledge about prenatal yoga is a supporting factor in interest in taking part in prenatal yoga, this is because most pregnant women pay close attention to what is expected by health workers that prenatal is very beneficial for pregnant women.

The implementation of health promotion using a yoga-based application, followed by a post-test assessment, demonstrated notable positive outcomes. Descriptive analysis of pre-test and post-test data revealed an increase in post-test scores, indicating a marked improvement in the participants' outcome. This supports the conclusion that yoga is one of the most beneficial and safe forms of exercise for both maternal and fetal health. Prenatal yoga, a non-pharmacological therapeutic approach, is specifically designed to relieve discomforts experienced during pregnancy. It is a modified form of Hatha yoga tailored to the unique physical and emotional needs of expectant mothers. Prenatal yoga is effective in easing pregnancy-related discomforts and promoting a smoother childbirth process. Moreover, yoga has been well received by younger pregnant women and has proven benefits such as reducing stress, increasing confidence in managing labor, and preparing for the baby's delivery. The integration of pregnancy classes is essential for pregnant women at any stage of

gestation. These classes typically include a range of activities, including pregnancy exercise sessions. Pregnancy exercise involves structured physical movements aimed at enhancing the health and well-being of pregnant women. These movements focus on strengthening and maintaining the flexibility of the abdominal wall, pelvic floor muscles, and ligaments, which are crucial for labor and delivery. The goal of health promotion through pregnancy exercise is not only to enhance pregnant women's understanding of the importance of physical activity during pregnancy but also to equip them with practical skills for staying active and healthy throughout gestation (Padeng EP, Senudin PK, Janggu PJ, 2021)

Engaging in yoga throughout pregnancy serves as an effective self-care strategy to alleviate discomfort. Yoga is beneficial in reducing anxiety, as it incorporates techniques focused on muscle control, breathing, relaxation, and mental calmness. Pregnant women who consistently participate in prenatal yoga sessions often experience relief from common third-trimester issues such as body aches, back pain, and muscle cramps (Widhayanti, 2019) . It is necessary to develop prenatal yoga optimally and in accordance with its principles through promotion by providing antenatal services to all pregnant women who make routine pregnancy check-ups that motivate pregnant women to follow it (Meilinda and Ayani, 2020).

CONCLUSIONS

Prenatal yoga offers substantial benefits for enhancing both the physical and psychological well-being of pregnant women, making it a valuable non-pharmacological intervention recommended during pregnancy. As such, incorporating prenatal yoga into pregnancy education programs is strongly encouraged to support maternal health.

The advantages of prenatal yoga are especially evident in improving knowledge about pregnancy and enhancing sleep quality. From a knowledge perspective, prenatal yoga contributes to better understanding of pregnancy, childbirth preparation, reduced anxiety, and increased health awareness. Regarding sleep quality, prenatal yoga helps reduce stress and anxiety, alleviates physical discomfort, enhances blood circulation, and supports more regular sleep patterns.

Promoting prenatal yoga through web-based applications is expected to empower pregnant women to practice independently at home. Therefore, researchers recommend that healthcare professionals actively utilize prenatal yoga health promotion websites and collaborate with educational institutions or healthcare services to motivate pregnant women to consistently engage in prenatal yoga exercises. Additionally, it is hoped that pregnant women will seek information from mass media and digital platforms such as the internet. With improved knowledge, they will be more likely to adopt and maintain prenatal yoga as a part of their pregnancy routine.

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