

# Effect of Yoga on Anxiety of Pregnant Women in Bali

## Efecto del yoga sobre la ansiedad de las mujeres embarazadas en Bali

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### SUMMARY

**Objective:** Anxiety is an obscure and pervasive concern, related to feelings of uncertainty and helplessness. Anxiety can be caused by certain circumstances. One condition that can cause anxiety is pregnancy. During pregnancy, mothers will experience changes in physical and psychological. Anxiety in pregnancy will have adversely affected the physical and psychological state of the mother and fetus. Yoga is one of the recommended exercises for reducing anxiety during pregnancy. The purpose of this study was to determine the effect of yoga on anxiety levels of third-trimester pregnant women at the Bumi Sehat Foundation Clinic.

DOI: <https://doi.org/10.47307/GMC.2023.131.s1.13>

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Recibido: 5 de febrero 2023

Aceptado: 11 de febrero 2023

**Methods:** This study is a quasi-experimental approach with a pretest-posttest control group design. The sample size in this study was 44, who were obtained based on consecutive sampling and fulfilled the inclusion and exclusion criteria. Respondents were divided by yoga group (22 people) and treatment as usual or TAU (22 people). There are 2 research variables, namely yoga as the independent variable, and the anxiety level of trimester III pregnant women as the dependent variable. The instrument used in this study is the state anxiety inventory questionnaire (S-Anxiety scale form Y- 1). Paired t-tests was used to determine differences in anxiety levels. The study was considered significant if  $p < 0.05$ .

**Result:** This research was conducted at the Bumi Sehat Foundation Clinic with the final respondents in each group (Yoga and TAU) 22 people. The result showed that there is a difference in the average anxiety in the pre-test of the yoga and TAU groups with an average of 33.00 and 32.00, respectively. In the post-test, the mean decrease was found in the yoga group by 3.91 and in the TAU group by 1.73. With the paired t-test it was stated that the decrease in anxiety was significant with a  $p$ -value  $< 0.05$  in both groups.

**Conclusion:** Yoga could be one of the alternative methods for reducing anxiety for pregnant women.

**Keywords:** Anxiety, third trimester, pregnant women, yoga, Bali.

### RESUMEN

**Objetivo:** La ansiedad es una preocupación oscura y generalizada, relacionada con sentimientos de incertidumbre e impotencia. La ansiedad puede ser

*causada por ciertas circunstancias. Una condición que puede causar ansiedad es el embarazo. Durante el embarazo, las madres experimentarán cambios físicos y psicológicos. La ansiedad en el embarazo habrá afectado negativamente el estado físico y psicológico de la madre y el feto. El yoga es uno de los ejercicios recomendados para reducir la ansiedad en el embarazo. El propósito de este estudio fue determinar el efecto del yoga en los niveles de ansiedad de las mujeres embarazadas del tercer trimestre en la Clínica de la Fundación Bumi Sehat.*

**Métodos:** *Este estudio es un enfoque cuasi experimental con un diseño de grupo de control de prueba previa y posterior a la prueba. El tamaño de la muestra en este estudio fue de 44, que se obtuvieron en base a un muestreo consecutivo y cumplieron con los criterios de inclusión y exclusión. Los encuestados se dividieron por grupo de yoga (22 personas) y tratamiento habitual o TAU (22 personas). Hay 2 variables de investigación, a saber, el yoga como variable independiente y el nivel de ansiedad de las mujeres embarazadas del tercer trimestre como variable dependiente. El instrumento utilizado en este estudio fue el cuestionario de inventario de ansiedad estado (S-Anxiety scale form Y-1). Las pruebas t pareadas se utilizaron para determinar las diferencias en los niveles de ansiedad. El estudio se consideró significativo si  $p < 0,05$ .*

**Resultado:** *Esta investigación se realizó en la Clínica de la Fundación Bumi Sehat y los encuestados finales en cada grupo (Yoga y TAU) son 22 personas. El resultado mostró que existe una diferencia en el promedio de ansiedad en el pretest de los grupos de yoga y TAU con un promedio de 33,00 y 32,00 respectivamente. En el post-test, la disminución media se encontró en el grupo de yoga en 3,91 y en el grupo TAU en 1,73. Con la prueba t pareada se afirmó que la disminución de la ansiedad fue significativa con un valor de  $p < 0,05$  en ambos grupos.*

**Conclusión:** *El yoga podría ser uno de los métodos alternativos para reducir la ansiedad de las mujeres embarazadas.*

**Palabras clave:** *Ansiedad, tercer trimestre, mujeres embarazadas, yoga, Bali.*

## INTRODUCTION

Pregnancy lasts 260-294 days from the first day of the last menstruation (1). Pregnancy is not only a happy time but also a stressful time for women both physically and mentally. Even in healthy women, pregnancy can cause various anxieties (2). Anxiety is a vague and pervasive

worry associated with feelings of uncertainty and helplessness. Anxiety includes fear of unexpected dangers that may occur in the future. Anxiety is similar to fear but with a less specific focus (3). According to data from the World Health Organization (WHO), regarding Depression and Other Common Mental Disorders: Global Health Estimates, 3.6 % of the world's total population experiences anxiety. Globally, anxiety is more common in women (4.6 %) compared to men (2.6 %). The prevalence of people with anxiety disorders in Indonesia reaches 3.3 % of the total population (4).

In a cohort study regarding the prevalence of anxiety in pregnancy and associated factors at a government maternity hospital in southern India, it was found that anxiety in pregnancy not only affects pregnant women, but also has an effect on births such as premature births, prolonged labor, cesarean delivery, and low birth weight babies (5). In this study, it was also shown that there was a relationship between gestational age and anxiety levels. The highest average level of anxiety is in the third trimester (106.89) compared to the first (100.36) and second trimester (85.50) (2).

There are various kinds of therapy used to reduce anxiety in pregnant women, one of which is yoga. The term yoga is defined as the unification of the body and mind to balance and harmonize the physical and mental functions of the body (6). Prenatal yoga has four sequences, namely centering, pranayama, warming up, and prenatal asanas (7). Asana is a synonym for yoga posture and pranayama is an equivalent to the breathing exercises that are carried out in the sessions. The word pranayama is a compound of two separate Sanskrit terms, *prana* and *yama*, and *prana* is "the fundamental basis of whatever is, was, and will be" or "life force" or "vital energy". Meanwhile, *yama* is often translated as "restraint" or "control". Pranayama then, is typically defined as a set of practices designed to control prana within the human body by means of various breathing techniques, meditative visualizations, and physical locks (or kumbhaka).

Anxiety can be assessed with several instruments. One commonly used rating scale is a State Anxiety Inventory questionnaire (S-Anxiety Scale Form Y-1). This questionnaire demonstrated excellent internal consistency

across samples and demonstrated adequate test and retest reliability (8).

Prenatal yoga can be carried out in hospitals, health centers, or private foundations. The Bumi Sehat Foundation Clinic is a non-profit in Gianyar Regency that regularly performs prenatal yoga and has a large number of participants from all walks of life. Based on the background, this study aimed to assess the effect of yoga on the anxiety level of third-trimester pregnant women at the Bumi Sehat Foundation Clinic.

## METHODS

The research design used was an analytic method with a quasi-experimental and a pretest-posttest control group design. This study was used to determine the comparison between the anxiety levels of third-trimester pregnant women before doing yoga and after doing yoga at the *Bumi Sehat* Foundation Clinic. Respondents in this study were pregnant women in the third trimester at the *Bumi Sehat* Foundation Clinic. The treatment group was pregnant women in the third trimester who did yoga at the *Bumi Sehat* Foundation Clinic, while the control group was pregnant women who did a pregnancy check-up (ANC) or treatment as usual (TAU) at the Bumi Sehat Foundation Clinic. The entire sample was selected based on inclusion criteria including singleton pregnancy, gestational age 29-38 weeks, and not having pregnancy disease or abnormalities. Mothers who refused to be respondents were excluded from the study.

Respondent selection in this study was done by using the consecutive sampling method. The sample size formula used in this study was a numerical comparative research formula in pairs of repeated measurements twice. The minimum average difference in decreasing anxiety which is considered significant is 5.5 and the combined standard deviation is 8.75 (9). By estimating the possibility of dropping out, the number of respondents for each treatment was 22 respondents. A questionnaire was used for data collection in this study which was divided into three parts. The first part is an explanation sheet

for the research respondent. The second part is the respondent's consent form which contains the respondent's identity such as name (3-letter initials), gestational age, and the respondent's telephone number. The third part is for collecting socio-demographic data of respondents which contains several questions, namely questions about age, last level of education, occupation, and parity. Followed by the State Anxiety Inventory questionnaire (S-Anxiety Scale Form Y-1) which is used to measure anxiety in pregnant women.

The S-Anxiety Scale questionnaire (STAI From Y-1) consists of 20 statements that evaluate how the respondent is currently feeling. The factors that are assessed by this questionnaire are feelings of fear, tension, nervousness, and worry. Each STAI item is given a Likert score of 1-4 which will be totaled with a minimum number of 20 and a maximum of 80. The questionnaire used is the S-Anxiety Scale questionnaire (STAI From Y-1) in Indonesian and has often been used in various previous studies. The validity and reliability test of the STAI questionnaire showed a Cronbach alpha value of  $> 0.6$ , which means that this questionnaire is good for use (10).

This research was carried out after being declared ethically feasible by the Health Ethics and Research Commission at Warmadewa University. Data analysis was carried out after evaluating the correctness and completeness of the data. Data normality was tested with the Kolmogorov-Smirnov test. The first analysis performed was descriptive analysis or univariate analysis to see the characteristics of the research respondents. Categorical data such as age, education level, occupation, and parity will be expressed in the form of frequency and percentage distributions. Continuous data such as anxiety was displayed in the form of mean and standard deviation if normally distributed or median if not normally distributed. Bivariate analysis was used to determine the effect of prenatal yoga on the anxiety level of third-trimester mothers with a  $p < 0.05$  which was said to be statistically significant. Paired t-test was used to assess the difference in the average anxiety before and after yoga if the data is normally distributed. If the data is not normally distributed, the Wilcoxon test was then used.

## RESULTS

This research was conducted at the *Bumi Sehat* Foundation Clinic with the initial number of participants in the Yoga group of 25 people, but 3 people were excluded for reasons as follows: 2 respondents did not fill out the post-test questionnaire and 1 respondent did not fill in data completely so that the final respondents in each group (yoga group and TAU group) totaled 22 people.

Table 1 shows that the average age of the respondents in the yoga group was 26.27 and in the TAU group was 27.55. All respondents were in the third trimester with an average gestational age of 33.27 in the yoga group and 34.27 in the

TAU group. Education level is divided into high (having more than junior high school education) and low (no education or less than junior high school education). The employment status in the yoga group is as follows: 5 respondents are not working and 17 respondents are working. In the TAU group, 12 respondents are not working and 10 others are working. In terms of parity in the yoga group, 15 respondents had less than 2 live births and 7 respondents had more than or equal to 2 live births. In the TAU group, 10 respondents had less than 2 live births and 12 respondents had live births greater than or equal to 2. All characteristics of the respondents studied had a  $p\text{-value} > 0.05$  indicating that there was no significant difference between the yoga and TAU group respondents.

Table 1. Respondents Characteristic

Variable	Yoga (n=22)	TAU (n=22)	<i>P</i> -value
Mean (SD) Age	26.27 (4.99)	27.55 (5.07)	0.41
Mean (SD) Pregnancy age	33.27 (3.25)	34.27 (3.13)	0.31
Education			1.00
High	20 (90.9 %)	21 (95.5 %)	
Low	2 (9.1 %)	1 (4.5 %)	
Working status			1.00
No	5 (22.7 %)	12 (54.5 %)	
Yes	17(72.3 %)	10 (45.5 %)	
Parity			0.13
<2	15 (68.2 %)	10 (45.5 %)	
≥2	7 (31.8 %)	12 (54.4 %)	

Source: Primary data, 2020

Table 2 indicates the anxiety level of third-trimester pregnant women in the yoga and TAU (treatment as usual) groups. The STAI form Y questionnaire used by the researcher to assess the anxiety of the respondents did not have provisions regarding the distribution of anxiety levels. Some studies use a score  $\geq 40$  to indicate severe anxiety in adults. Researchers referred to a study that divided anxiety levels into mild

anxiety (score 20-37), moderate anxiety (score 38-44), and severe anxiety (score 45-80) (11). Based on Table 3, it can be explained that most of the respondents had mild anxiety, namely 63.6 % in the yoga group and 77.3 % in the TAU group. A small proportion of respondents had moderate anxiety, namely 36.4 % in the yoga group and 22.7 % in the TAU group. None of the respondents had severe anxiety.

Table 2. Anxiety Baseline of Respondents

Anxiety Level	Yoga (n=22)	TAU (n=22)
Mild	14 (63.6%)	17 (77.3%)
Moderate	8 (36.4%)	5 (22.7%)
Severe	0	0

Source: Primary data, 2020

Table 3 shows that there is a difference in the average anxiety in the pre-test of the yoga and TAU groups with an average of 33.00 and 32.00, respectively. In the post-test, the mean decrease

was found in the yoga group by 3.91 and in the TAU group by 1.73. With the paired t-test it was stated that the decrease in anxiety was significant with a p-value <0.05 in both groups.

Table 3. Anxiety level before and after treatment in yoga and TAU group

Group	Pretest Mean ± SD	Posttest Mean ± SD	Paired t-test		p
			Δ mean	95 % CI	
Yoga	33.00 ± 7.26	29.09 ± 6.93	3.91	1.737-6.081	0.001*
TAU	32.00 ± 6.78	30.27 ± 7.05	1.73	0.435-3.019	0.011*

Source: Primary Data, 2020

## DISCUSSION

This study found a decrease in the average anxiety in the yoga and TAU group respondents. In both groups of respondents, there was a significant decrease in the average anxiety, but the average reduction in anxiety in the yoga group was greater than in the TAU group with an average number of reductions in anxiety, 3.91 and 1.73, respectively. This is in line with research conducted by Newham et al., which showed that there was a decrease in the average anxiety in one yoga session in the yoga and TAU group respondents ( $p < 0.001$ ) (12). This was also reinforced by Davis et al., who showed that there was an average decrease in anxiety levels in the yoga group by 2.91 and in the TAU group by 2.07 (13).

Anxiety occurs in 26.8 % of pregnant women and is more common in the final trimester of pregnancy. Anxiety in pregnancy has been associated with an increase in obstetric complications including stillbirth, low birth weight infants, postnatal specialist care for the infant and susceptibility to more adverse neuro-

developmental outcomes including behavioral, emotional and cognitive problems. The high anxiety rate in the third trimester is related to the approaching time of delivery. It can be explained that pregnancy and childbirth are felt by some pregnant women as moments of vulnerability, capable of triggering feelings of fear in women, and this can occur even in women who have experienced previous births. Mothers who have fear of childbirth have a greater risk of experiencing anxiety during pregnancy (14).

Antenatal care is a series of services provided by trained health service providers to improve the quality of pregnancy for mothers and babies. The general goal to be achieved is to make sure that the mother and baby are healthy at the end of pregnancy and childbirth by identifying and preventing risks that can harm the health of the mother and baby (15). Missa et al. showed that there is an effect of antenatal care on the anxiety level of pregnant women, where a mother who has high adherence in carrying out antenatal care shows a lower level of anxiety, compared to mothers who are disobedient in carrying out antenatal care (16).

Pregnancy can cause anxiety, especially if the mother does not know how to deal with the changes experienced during pregnancy, so accurate and adequate information is very important to reduce the anxiety felt during pregnancy. In addition to health checks, during the antenatal care session, mothers are also given information and advice for a healthy pregnancy. The topics presented can cover the physiological changes that occur during pregnancy and the warning signs that may occur. Moreover, other topics could also be covered especially regarding nutrition, preparing for childbirth, baby care, and breastfeeding so that mothers can have valid information and are expected to reduce the fear and anxiety experienced (17).

Yoga comes from the word “Yuj” which means joining or oneness. Yoga is the unification or alignment of the body and mind which is carried out in the stages of asana (posture), pranayama (breathing), and meditation (6,18). According to Ningrum et al., more than 70 % of the results showed that yoga can significantly reduce stress and symptoms of anxiety (19). Yoga can reduce stress and anxiety which are activated by the autonomic nervous system. An hour of yoga session will increase the levels of gamma-aminobutyric acid (GABA) neurotransmitter in the prefrontal cortex of the brain so that it will help reduce symptoms of depression (20).

Serotonin, is a powerful neurotransmitter which plays a major role in mood regulation. A deficiency of serotonin is associated with depression. Yoga also has a positive effect on the serotonin levels. Respondents in the yoga group showed an increase in serotonin in urine after meditation. Several studies performed on participants after they concluded their meditation sessions, observed a rise in the breakdown products of serotonin in the urine when compared with the group who did not do their yoga meditation sessions (21).

Jiang et al., stated that yoga is an effective intervention for both pregnant women and their babies (22). Study results consistently show that the yoga intervention group has lower incidences of gestational hypertension and preeclampsia, lower pain levels, and lower levels of stress, anxiety, and depression. In addition, yoga can also improve quality of life and reduce macrosomia

incidents. Several studies have consistently and significantly shown that yoga is more effective than walking or standard prenatal exercise (5,23).

Yoga is one of the solutions to assist in the process of pregnancy and childbirth. Yoga is a body, mind, and mental exercise that helps pregnant women to flex muscles, and joints and calm the mind, especially in the third trimester. Prenatal yoga includes building positive thoughts about childbirth at a deep relaxation level so that mothers can grow the courage to face childbirth (24).

## CONCLUSION

Yoga helps to reduce anxiety levels greater than usual treatment. Yoga can be included as a complement to prenatal classes either privately or in a government program to reduce anxiety and improve pregnancy outcomes for the baby and mother.

## Acknowledgments

The author is grateful to the Faculty of Medicine and Health Science, Universitas Warmadewa, Bali, Indonesia, for the support given. We also thank all respondents and *Bumi Sehat* Foundation Clinic for all contributions during this research.

## Funding

The author(s) received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

## Authors' Contributions

All contributors contributed significantly to this study and all authors agree with the content of the manuscript.

## Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research authorship, and/or publication of this article.

## Availability of Data and Materials

All data generated or analyzed during this study are included in this published article.

## Ethical Approval

This article received ethical clearance from the Ethical Committee of Faculty Medicine and Health Science, Universitas Warmadewa with letter number 093/Unwar/FKIK/EC-KEPK/II/2020

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