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## Effect of mindfulness-based stress reduction on stress levels among first-trimester pregnant women in Neglasari Public Health Center working area

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### Abstract

**Background:** Pregnancy is a significant period that brings many changes, both physically and emotionally, as well as psychosocially. This condition often leads to excessive stress in pregnant women. If not addressed, it can impact the health of both the mother and the fetus. One method considered effective for managing stress is Mindfulness-Based Stress Reduction (MBSR).

**Purpose:** To determine the effect of MBSR intervention on stress levels in pregnant women.

**Method:** A Quasi-Experiment with a One-Group Pre- and Post-Test design. The sampling technique used total sampling with 26 respondents. The instrument used to measure stress levels was the DASS questionnaire.

**Results:** Data analysis showed that the average stress level before MBSR intervention was 19.77, which decreased to 16.15 after the intervention, with a standard deviation of 0.710 for pre-test and 1.953 for post-test. Statistical test results showed a P-Value of 0.000 ( $<0.05$ ), indicating a significant difference in stress levels before and after the intervention.

**Conclusion:** The MBSR intervention significantly affects the reduction of stress levels in pregnant women, as evidenced by the decrease in the average stress scores before and after the intervention.

**Keywords:** MBSR; Mindfulness; Stress; Pregnant Women.

### INTRODUCTION

Pregnancy is a journey filled with hope and joy but also accompanied by significant emotional challenges. Women during pregnancy often experience numerous physical and psychological changes that increase the risk of psychological disorders (Salsabila, 2025). Some pregnant women experience physical changes such as body enlargement, the emergence of acne on the face, or skin peeling (Mardiah, Sumarni, & Isnawati, 2023). These hormonal changes also cause psychological changes in pregnant women, leading to emotional shifts such as increased sensitivity, lethargy, a desire for more attention, jealousy, and stress. Fundamentally, stress in pregnant women during the first trimester is a physical, mental, and emotional reaction to the significant changes that occur at the

beginning of pregnancy (Mosavi, Faraji, & Zebardast, 2018). According to the World Health Organization (WHO) in 2022, nearly one in five women suffers from mental disorders during pregnancy or up to one year after giving birth. About 10% of pregnant women experience mental disorders, especially depression and stress. In developing countries, the incidence is recorded to be higher, reaching 15.6% during pregnancy. Recent findings from the 2023 Indonesian Health Survey (IHS) indicate a significant increase, with the prevalence of emotional mental disorders among the population aged 15 years and older reaching 10.2% (Wulandari & Susanti, 2019). The incidence of stress among pregnant women in the first trimester in Indonesia is relatively high, with a prevalence range of 33.9% to 43.26%. Banten is

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recorded as the third-highest province for mental health issues in Indonesia, with an emotional rate of 2.7% (Heydarpour, Feli, Yazdanbakhsh, & Heydarpour, 2020).

The stress felt by pregnant women can impact both the fetus and the mother. Excessive stress can lead to serious pregnancy risks such as pre-eclampsia, miscarriage, and other serious pregnancy-related issues. For the fetus, stress can reduce oxygen supply and increase the risk of Low Birth Weight (LBW) babies (Phan, Renshaw, Caramanico, Greeson, MacKenzie, Atkinson-Diaz, & Nuske, 2021). Indirectly, stress can affect the baby's development by negatively impacting the mother-baby interaction and also hinder the neurobiological development of the fetus (Bukhori, Yanti, & Rahmawati, 2023). Based on this data, it is clear that psychological pressure or stress in pregnant women is a serious health issue but can be addressed with proper interventions. Several interventions from various studies can be employed to reduce stress levels in pregnant women. One non-pharmacological intervention that can be used is Mindfulness Therapy (Wu, Sun, Chen, Wu, Ding, Liang, & Ming, 2021).

Mindfulness is an individual's ability to be aware and pay attention to every detail of the occurrence happening at that moment (Runjati & Mardiyono, 2023). Mindfulness, which refers to full awareness of the experiences being felt, has been proven effective in reducing stress (Wang, Zhang, Sun, Zhang, Luo, Liang, & Wang, 2023). In the context of pregnancy, Mindfulness can be utilized to assist pregnant women in managing their stress in a more manageable and healthy manner (Pujiati & Ananta, 2025). One strength of Mindfulness is its flexibility. Mindfulness for pregnant women in the first trimester is a practice of full awareness where mothers learn to be fully present in the moment, accepting all physical and emotional changes with an open attitude, certainly without judging oneself. Through the practice of mindfulness, Mindfulness-Based Stress Reduction (MBSR) works by suppressing the activity of the sympathetic nervous system and activating the parasympathetic nervous system (Rinera & Retnowati, 2020). This directly leads to a decrease in cortisol hormone secretion while simultaneously stimulating the release of welfare hormones such as endorphins and oxytocin (the love hormone) (Yazdanimehr, Omid, Sadat, & Akbari, 2016). Neurologically, mindfulness is also known to reduce the reactivity of the amygdala the

brain's fear center and strengthen the prefrontal cortex's control in regulating emotions. With these hormonal and neurological changes, stress levels in pregnant women can significantly decrease, creating a more stable and healthy intrauterine environment for fetal growth (Kristyaningrum, 2022).

## RESEARCH METHOD

This research employs a quantitative method with a quasi-experimental approach and a one-group pretest-posttest design. The sample consisted of 26 first-trimester pregnant women selected using total sampling. A questionnaire sheet was used as a data collection instrument. The inclusion criteria were first-trimester pregnant women identified as experiencing moderate stress (based on initial screening results), who voluntarily participated as respondents, were cooperative, and were proficient in reading and writing. This study was conducted in the Working Area of Neglasari Health Center, Tangerang City. The study was carried out sequentially from February to March 2026. To measure stress levels, this research utilized the *Depression Anxiety Stress Scale* (DASS) questionnaire developed by Lovibond and Lovibond (1995). This instrument consists of 14 items using a 4-point Likert scale, which has been validated with a calculated  $r$  of 0.01 and a table  $r$  of 0.05, and its reliability (Cronbach's Alpha = 0.735) is based on previous adaptations.

The *Mindfulness-Based Stress Reduction* (MBSR) intervention was implemented directly by the researcher according to the Standard Operating Procedures (SOP) for two consecutive weeks, with each session lasting 15-20 minutes. The therapeutic stages included an introduction phase (identifying and becoming aware of stress conditions and the responses that arise), a practice phase (*mindful breathing and body scan*), and a self-application phase (applying mindfulness techniques to daily stressors more consciously and *non-judgmentally*). Univariate analysis was conducted to determine the frequency distribution of respondent characteristics and research variables. Bivariate analysis to evaluate pre- and post-intervention effects was carried out using the non-parametric Wilcoxon Signed-Rank Test, as the data were not normally distributed (Shapiro-Wilk  $p < 0.05$ ). This study strictly adhered to the principles of health research ethics.

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## RESEARCH RESULTS

Table 1. Distribution of Respondent (N=26)

| Variable                                  | Results              |
|-------------------------------------------|----------------------|
| <b>Age (n/%) (Mean±SD) (Range) (Year)</b> | (28.3 ± 2.7) (20-40) |
| 20-35                                     | 24/92.3              |
| ≥35                                       | 2/7.7                |
| <b>Education (n/%)</b>                    |                      |
| Elementary School                         | 8/30.8               |
| Senior High School                        | 18/69.2              |
| <b>Pregnancy Order (n/%)</b>              |                      |
| First Pregnancy (Primigravida)            | 24/92.3              |
| Second Pregnancy (Secundigravida)         | 2/7.7                |
| <b>Stress Level Pretest (n/%)</b>         |                      |
| Mild                                      | 0/0.0                |
| Moderate                                  | 26/100.0             |
| <b>Stress Level Posttest (n/%)</b>        |                      |
| Mild                                      | 21/80.8              |
| Moderate                                  | 5/19.2               |

Table 1 presents the demographic characteristics and stress levels of the 26 pregnant women included in the study. The participants had a mean age of  $28.3 \pm 2.7$  years, with an age range of 20–40 years. Most respondents were 20–35 years old (24; 92.3%), while only 2 respondents (7.7%) were aged  $\geq 35$  years. Regarding educational attainment, 18 respondents (69.2%) had completed senior high school, whereas 8 respondents (30.8%) had completed elementary school. Based on pregnancy order, the majority were primigravida (24; 92.3%), while 2 respondents (7.7%) were secundigravida. Regarding stress levels, all respondents (26; 100.0%) experienced moderate stress at the pre-test assessment. Following the intervention, the majority of respondents experienced mild stress (21; 80.8%), while 5 respondents (19.2%) remained in the moderate stress category. These findings indicate a shift toward lower stress levels after the intervention.

Table 2. Results of the Wilcoxon Signed-Rank Test

| Variable               | Mean           | Standard Deviation | Mean Difference | Sig   |
|------------------------|----------------|--------------------|-----------------|-------|
| <b>Pre – Post Test</b> | 19.77<br>16.15 | .710<br><br>1.953  | 13.00           | 0.000 |

Table 2 shows pregnant women experienced a decline in stress scores (Negative Rank) after the Mindfulness intervention. There were no pregnant women who showed an increase in scores (Positive Rank = 0) or scores that remained unchanged (Tied =

0). Statistical analysis produced a P-value of 0.00. Because the P-value ( $0.00 < 0.05$ ), the null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_a$ ) is accepted, concluding that Mindfulness-Based Stress

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Reduction significantly reduces stress in pregnant women in their first trimester in the working area.

## DISCUSSION

Descriptive findings show that all pregnant women in the first trimester (100%) initially experienced moderate stress, with an average score of 19.77. The average stress level in respondents before receiving the MBSR intervention was 27.59, with a standard deviation of 8.178 (Adilla, Misrawati, & Indriati, 2023). An average prior to MBSR intervention of 16.5 with a standard deviation of 3.500. Both studies indicate that pregnant women often experience unstable emotional conditions due to hormonal changes and concerns for fetal conditions (Jumaiyah, Sofiani, Yunitri, Agung, Rayasari, Anggraini, & Sugiri, 2025). Interviews conducted with respondents revealed that most pregnant women experience stress in early pregnancy, attributed to worries about pregnancy conditions, uncertainty about fetal development, and physiological and psychological changes occurring in early pregnancy. Some expressed anxiety about their ability to manage pregnancy well, worries about potential complications, and uncertainty regarding their changing roles as mothers (Yuliana, Romdhani, & Nulhakim, 2024).

Post-intervention measurements revealed a decrease in stress levels; the majority of pregnant women (80.8%) shifted to the mild stress category, lowering the total average score to 16.15. After MBSR intervention, they felt calmer, better able to manage thoughts that triggered stress, and capable of calming themselves during psychological pressure. The breathing techniques and meditation taught routinely helped them focus more on current events and reduce negative thoughts they had experienced in the past or present. The application of MBSR through meditation and breathing exercises enhances psychological well-being, as evidenced by reduced stress, depressive symptoms, negative thinking, decreased perception of stress and anxiety, and increased positive thinking (Innab, Al-Khunaizi, Al-Otaibi, & Moafa, 2023).

Bivariate analysis confirms a direct and significant decrease between the provision of Mindfulness-Based Stress Reduction and stress reduction in the working area. The Wilcoxon Signed-Rank test produced a P-value of 0.00 at a significance level of  $\alpha = 0.05$ , meaning  $H_a$  is accepted and 100% of the

sample (26 pregnant women) experienced a positive reduction in stress vulnerability scores (Negative Rank). These results indicate that Mindfulness-Based Stress Reduction therapy is effective in reducing stress levels, as it helps respondents feel more relaxed and relieved. With the MBSR intervention, pregnant women are guided to practice mindfulness, recognize the stress they feel, and identify negative thoughts. Mindfulness-Based Stress Reduction (MBSR) is a form of psychological therapy for pregnant women that emphasizes full awareness of oneself, aimed at helping them manage and adapt to pregnancy stress (Hentu, Muchlisin, Jamil, Astuti, & Rafikayanti, 2024).

This success is greatly influenced by the commitment of pregnant women and adherence over a consecutive 2-week period. Additionally, stress reduction is supported by internal factors, such as the openness of respondents during the mindfulness intervention. Although 5 respondents (19.2%) remained in the moderate stress category after the intervention, researchers assume that this is due to internal factors such as the respondents' ability to increase (self-awareness) and to accept their experiences non-judgmentally. Overall, this research reinforces psychiatric nursing evidence that Mindfulness-Based Stress Reduction (MBSR) is highly applicable for reducing psychological stress among first-trimester pregnant women (Mamuroh, Sukmawati, & Nurhakim, 2022).

## CONCLUSION

Based on the research findings regarding the effect of *Mindfulness-Based Stress Reduction* on reducing stress levels in first-trimester pregnant women in the working area, baseline data indicate that the majority of respondents are aged 20-35 years (92.3%), most have completed high school or higher education (69.2%), and the majority are in their first pregnancy (92.3%). The distribution of stress before the intervention (pre-test) shows that 100% of respondents experienced moderate stress with an average final score of 19.77. After the *mindfulness* intervention (post-test), the stress levels significantly decreased, with 80.8% of respondents moving to the mild stress category, and the final average score decreasing to 16.15. Bivariate analysis using the Wilcoxon Signed-Rank Test yielded a significance

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value of  $P = 0.00$ . Since  $P < 0.05$ , it is concluded that *Mindfulness-Based Stress Reduction* is effective in reducing stress levels in first-trimester pregnant women in the working area.

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Effect of mindfulness-based stress reduction on stress levels among first-trimester pregnant women in Neglasari Public Health Center working area

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