Impact of Mindfulness -Based Stress Reduction Program on Prenatal Anxiety, Depression and Sleep Quality Among Primigravida Women

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Abstract

Background: Prenatal anxiety and depression are common mental health concerns that can significantly affect sleep quality among primigravida women. Addressing these issues is crucial for enhancing maternal well-being and healthy pregnancy outcomes. **Aim of study:** evaluating the impact of a mindfulness-based stress reduction program on prenatal anxiety, depression, and sleep quality among primigravida women. **Research design:** A quasi-experimental study design was applied. The study was conducted at the General Medical Center in New Damietta. A purposive sample of 50 primigravida women were included. **Data collection tools:** A self-administered questionnaire was utilized for data collection, which consisted of four parts which were; Personal Characteristics Data Sheet, Edinburgh Postnatal Depression Scale, Pregnancy-Related Anxiety Questionnaire–Revised, and the Pittsburgh Sleep Quality Index. **Results:** The study revealed that 28% of the pregnant women had severe anxiety at pre-intervention phase, compared to all of them improved from severe anxiety post-intervention, 90% of participants had moderate depression in pre-intervention, compared to 34% of them had moderate depression in post- intervention, and 82% of participants had poor sleep quality in pre-intervention, compared to 34% of them had poor sleep quality post- intervention. **Conclusion:** Mindfulness-based stress reduction program significantly alleviated anxiety, depression, and improved sleep quality during pregnancy. **Recommendation:** Integrate mindfulness-based interventions into routine prenatal care to enhance maternal mental health and overall well-being. Future research: investigate the long-term effects of mindfulness-based interventions on both maternal and neonatal outcomes, including postpartum mental health and infant development.

Keywords: Anxiety, Depression, Mindfulness, Primigravida, Sleep quality.

Introduction:

Pregnancy and the childbirth are significant periods in woman's life, characterized by stress, anxiety, and depression. These emotions can negatively influence both pregnant woman and the fetus (**Yang et al. 2021; Mefrouche et al., 2023**). According to previous scholars, mental health conditions including anxiety and depression are more common in the first and third trimesters of pregnancy, which increases the risk of miscarriages, maternal suicides, and early birth among primigravid women (**Van Niel & Payne, 2020**). In addition to having an adverse effect on the fetus, these problems may cause behavioral abnormalities, neurodevelopmental deficits, and psychological challenges for the newborn in the future (**Grande et al., 2021**).

Pregnant women who suffer from anxiety may experience stress, mood swings, melancholy, loneliness, and irritability. Primigravida women experience higher anxiety levels due to a lack of knowledge about minor discomfort, worries about childbirth, quality of care during labor, and support from relatives and friends. This is especially common in primigravida women, who may feel more depressed, lonely, impatient, and narrow in their interests in the final weeks of pregnancy (**Gouda Nasr et al., 2019 and Răchită et al., 2022**).

Similarly, prenatal depression is a prevalent problem that occurs throughout pregnancy and results in persistent sorrow, worry, exhaustion, and trouble sleeping. It may result in diminished interest in activities and disengagement from friends and family. Despite receiving less attention than postpartum depression, the study of antenatal depression is becoming more prominent in recent years (**Radoš et al., 2024**).

Numerous variables that may be detected early in pregnancy can have an impact on antenatal depression. Three primary risk variables were identified by the literature review:

psychological, obstetric, and sociodemographic factors. limited economic income and education are sociodemographic variables; unintended pregnancies are obstetric factors; and psychological risk factors include anxiety, stress, limited social support, and a history of psychiatric illnesses (**Míguez & Vázquez, 2021**).

Additionally, Hormonal, mental, emotional, and physical variables during pregnancy can induce sleep problems and disturb sleep patterns. Ninety-seven percent of expectant mothers say they have trouble sleeping. Late pregnancy might cause nocturnal awakenings, early awakenings, increased sleep issues, and trouble falling asleep. Sleep disruptions can lead to adverse pregnancy outcomes, including hypertension, gestational diabetes, and cesarean delivery. (**Anbesaw et al., 2021, Takelle et al., 2022 & Merrill, 2022**).

A type of human consciousness known as mindfulness is defined as paying attention and concentration on the here and now without passing judgment. It might be difficult at first but is associated with better psychological states. Because unconscious thoughts, actions, and behaviors often deviate from ideals, mindfulness practice can assist improve the ability to stay in the present. People might be more tolerant of their ideas and feelings by becoming more aware of their inner worlds, which may lessen the symptoms of anxiety and sadness (**Kabat-Zinn, 2023**).

By increasing inner focus and enhancing self-regulation through mindfulness meditation, body awareness, yoga, and other practices, mindfulness-based stress reduction is a successful strategy for reducing psychological stress. It has remarkable advantages over pharmacological therapies during pregnancy in terms of lowering

anxiety, depression, and bolstering beliefs. It is generally recognized that mindfulness therapies are an effective way to treat and prevent mental health issues during pregnancy. With remarkable success, mindfulness therapy has been utilized increasingly since its inception to treat a range of mental health issues, such as anxiety and depression **(Green et al., 2020; Nourian et al., 2021 & Mefrouche et al., 2023).**

Significance of the study:

Hormonal changes and other circumstances during pregnancy has a major effect on the mental health of pregnant mothers, especially primigravida. Mental health issues that are more likely to arise at this time may impact a child's development. worldwide, mental disorders, mostly depression, affect 13% of babies and 10% of pregnant mothers. In underdeveloped nations, the rate is significantly higher, at 15.6% throughout pregnancy and 19.8% following delivery **(Hemlata & Shikha, 2022).**

Prenatal mindfulness training are effective and realistic means of lowering stress, anxiety, and depression and enhancing sleep quality throughout the perinatal period **(Pan et al., 2023).** Therefore, the current study aimed to evaluate the impact of the Mindfulness-Based Stress Reduction (MBSR) Program on the anxiety, depression, and sleep quality of primigravida women during pregnancy.

Aim of the Study:

The study aimed to evaluate the impact of a mindfulness-based stress reduction Program on prenatal anxiety, depression, and sleep quality among primigravida women.

This was achieved through:

1- Assessing the level of anxiety, depression, and sleep quality among primigravida women.

2- Designing, implementing, and evaluating a mindfulness-based

stress reduction Program on prenatal anxiety, depression, and sleep quality among primigravida women.

Research hypotheses:

H1: Primigravida women who participate in the MBSR program will exhibit a substantial decrease in prenatal anxiety and depression levels following the intervention when compared to baseline measurements.

H2: Primigravida women who receive the MBSR intervention will report significantly improved sleep quality post-intervention compared to their sleep quality before the program.

Subjects and Methods:

Research Design:

To achieve the study's goal, a quasi-experimental pre-test post-test one-group design was used.

Research Setting:

This study was conducted at the General Medical Center in New Damietta, which serves more than 42,853 citizens. The center offers a wide range of healthcare services, including emergency care, outpatient services, and specialized medical consultations. It comprises approximately 10 outpatient clinics, such as the Antenatal Care Clinic, Pediatrics Clinic, Internal Medicine Clinic, Dermatology Clinic, Mental Health Clinic, Neurology Clinic, and the Gynecology and Obstetrics Clinic.

In addition to clinical services, the center provides dental care, family planning and counseling, immunizations, health education, environmental health services, and care for youth and adolescents. It is also equipped with physiotherapy and radiology units, making it a comprehensive primary healthcare facility that addresses the diverse medical needs of the local population.

Study Sample:

The study sample consisted of all available primigravida women over a period of six months, the duration of the study, totaling 50 participants. The inclusion was based on the following criteria:

- Ages ranged from 18-40 years
- Accept to participate in the study

Exclusion Criteria:

- Women with a history of diagnosed psychiatric disorders or currently on psychiatric medication.

- Absence of high-risk pregnancies or any medical conditions that may interfere with participation in the Mindfulness-Based Stress Reduction program, such as severe hypertension, preeclampsia, and uncontrolled gestational diabetes**.**

Data collection Tools:

Data for the current study was gathered using a self-administered questionnaire that had four sections;

Part (I): Personal Characteristics Data Sheet:

The researchers created this structured interview questionnaire in the Arabic language, which included personal information like age, educational level, occupation, gestational age, family support, stress associated with pregnancy, number of hours of sleep per day, level of physical activity, and previous medical history.

Part (II): Pregnancy-Related Anxiety Questionnaire–Revised

This scale was developed by **Huizink et al. (2004).** It is a popular tool for evaluating and identifying pregnancy specific anxiety in nulliparous women. It exhibits predictive validity for outcomes related to pregnancy and childhood, as well as strong psychometric characteristics.

Scoring System

This tool consists from Ten questions that divided into three subscales: fear of giving birth (items 1, 2, and 6); worries of

bearing a physically or mentally handicapped child (items 4 ,8, 9, and 10); and concern about own appearance (items 3, 5, and 7). Each item has a 4-point likert scale of 0 = never, 1 = hardly ever, 2 = sometimes, and 3 = yes quite often, with a cumulative score of 30 points. Based on quartile categorization, it was separated into three levels: mild, moderate, and severe levels according to the following:

1. Mild anxiety is indicated by a score between the 25% and less than the 50%.

2. Moderate anxiety is indicated by a score in the 50% to less than the 75%.

3. Severe anxiety is indicated by a score of 75% or above.

Part (III): Edinburgh Postnatal Depression Scale:

This scale was developed by (**Cox et al., 1987**) and adopted by (**Chorwe-Sungani & Chipps, 2017**). This 10-item self-report test was created to check for emotional discomfort in pregnant and postpartum women. For low resource settings, its accuracy, sensitivity, and specificity make it the ideal option. To prevent overlap with typical pregnancy-related changes, the scale excludes physical symptoms and concentrates on the cognitive and emotional elements of depression.

Scoring System

Each item is scored on a 4-point Likert scale ranging from 0 to 3. For positively worded items, responses are scored as follows: 0 = as much as I always could, 1 = not quite so much now, 2 = definitely not so much now, and 3 = not at all. For negatively worded items, scoring is reversed: 0 = no, not at all, 1 = not very often, 2 = yes, quite often, and 3 = yes, most of the time. Items 3 and 5 through 10 are reverse scored. The total score is the sum of the 10 items, with a maximum of 30. A score of 10 or higher suggests possible depression and indicates the need for further medical evaluation, while a score above 13 is often considered the cutoff for likely clinical depression.

The total score of maternal depression was classified as follows:

- Mild depression (less than 50%)
- Moderate depression (50% - 75%).
- Severe depression (above 75%).

Part (IV): The Pittsburgh Sleep Quality Index (PSQI)

It is a standardized self-report tool developed by **Buysse et al. in 1989** to evaluate the amount and regularity of sleep throughout the previous month. There are 10 subparts and nine questions on the scale. Subjective sleep quality, sleep length, sleep disruptions, sleep latency, daytime dysfunction brought on by drowsiness, habitual sleep efficiency, use of sleep aids, and total sleep quality are the seven areas into which the questions are divided.

Scoring System

Responses were graded from zero to three. A score of "0" indicates no difficulty, while "1" indicates mild difficulty, "2" indicates moderate difficulty, and "3" indicates severe difficulty. One global score, with a range of 0–21 points—0 denoting no difficulty and 21 denoting severe problems in all areas—was then obtained by adding the seven component scores. The overall mother sleep quality score was categorized as follows: Good sleep (less than 50%) and poor sleep (more than 50%).

Validity and Reliability of the Study Instruments:

For the purpose of the current study, the scales were translated into Arabic using the translation-back-translation process to guarantee cross-linguistic equality. Translation was finished in two major phases, including forward and backwards. The study used a translation-back-translation process to translate scales into Arabic for cross-linguistic equality by three multilingual experts translating the original scale and three blind backward translations from Arabic to English. The translated versions were compared to

the original scale to verify accuracy and match the original.

To ascertain the reliability of the translated instruments, it confirmed using a test–retest approach, yielding a Pearson coefficient of 0.87, 0.81, 0.90 for scales of Edinburgh Postnatal Depression Scale**,** Pregnancy-Related Anxiety Questionnaire–Revised and Pittsburgh Sleep Quality Index respectively which signifying worthy reliability.

Pilot study

Prior to starting the actual data collection, a pilot research was conducted on 10% of all the study sample who were chosen randomly. A pilot study had been carried out to assess time necessary to complete the instruments, test their lucidity, applicability, significance, and feasibility. Furthermore, finding any hurdles that can impede the data collection process. Women who shared in a pilot study were accepted from the entire research sample to

guarantee the consistency of the results.

Ethical considerations:

The Health Research and Ethics Committee of Damietta University's Faculty of Nursing granted ethical permission (DuRec no 28 on July 28, 2024). To acquire their agreement and to explain the study's goal, the researchers visited with the nursing and medical directors of the chosen location. Following their explanation of the study's purpose, the pregnant ladies gave their written consent to take part. The pregnant women were advised by the researchers that participation in the study was entirely optional and that they might leave at any moment, for any reason.

Fieldwork:

Data was collected over six months, from the beginning of October 2024 to the end of March 2025. The intent of the study and how to fill the study instruments were clarified to subjects by the researcher. Subsequently, a written informed consent of each woman who come across the

eligibility criteria was obtained. The self-administered instruments were distributed by the researchers to the subjects in the waiting room and filled by them in the attendance of the researcher to address any inquiry. A total of 50 primigravida women were recruited and divided into 5 groups, each consisting of 10 participants. The program was implemented at the antenatal clinic at Medical Center in New Damietta over a period of six months.

Each group received the Mindfulness-Based Stress Reduction (MBSR) intervention through 10 sessions, delivered twice per week. Each session lasted approximately 60 minutes, comprising 30 minutes of theoretical instruction (covering mindfulness principles, prenatal stress education, and group discussion) and 30 minutes of practical training (including mindfulness meditation, breathing exercises, and body scanning). The full program duration for each group was about 5 weeks.

Generally, one group was trained per day; however, in some weeks, two groups were scheduled alternately to complete the program within the study period. Sessions were held on Sundays, Tuesdays, and Thursdays, typically starting at 10:00 AM and ending around 1:00 PM, depending on the group's needs and logistics.

During the pre-intervention phase, participants were met individually to complete the baseline assessment tools in a quiet and private environment to ensure accuracy and comfort before the start of the MBSR sessions. The time required for filling the instruments extended from 15 to 20 minutes.

Mindfulness-based stress reduction program:

The mindfulness program was developed by the researcher after literatures review. The program had general and specific objectives for

each session. It was designed to evaluate the effect of a mindfulness-based stress reduction program on pregnant women's anxiety, depression and sleep quality. It consisted of three main phases.

I: Preparatory phase:

It was predicated on assessment data gathered through learning, knowledge, and practices, book reviews, and interview surveys. The program consisted of theoretical and practical parts in which had a set of specific objectives.

II: Implementation phase:

The teaching sessions were conducted in the training hall. It was quiet, ventilated, good furnished, and had adequate lighting for implementing the program. The program content and its objectives were developed by the researcher in the form of 10 sessions (introductory session, 2 sessions for theoretical part, 6 sessions for practical part and the final session was summery for the contents of the program). Each

session took about 30-60 minutes according to the subjects' understanding and span of attention. Each session started by greeting the participants, assessing their motivation for learning, getting feedback about what was given through the previous session, and present the objectives of the new topic. At the end of every session, participants' questions were discussed to correct any misunderstanding that would have happened. After finishing the program sessions, the researcher thanked the subjects for their participation and asked for any unclear points.

Session 1: Introductory session included identifying the Pregnant women, explained the purpose, rules of the program, the instrument they would be using to gather the necessary data, sequence and the time frame of the programmer' s sessions. The researcher used an Arabic language

that was suitable for women to grasp during the session.

Session 2 (Theoretical): Contained definition of mindfulness, anxiety, depression and sleep quality, benefits of mindfulness-based stress reduction.

Session 3 (Theoretical): Contained types of MBSR, description of mindful thinking, learn about the physiological and psychological bases of stress reactivity. It was implemented through lectures, posters, educational films, and scenarios

Session 4 (Practical): Practicing mindful body scan by scanning each area of the body, from head to toe, we can develop a heightened sense of body awareness and learn to respond to its needs with compassion and care.

Session 5 (Practical): Practicing mindful hatha yoga which combines movement, breath, and mindfulness. By focusing on the body's alignment, breathing patterns, and the sensations we experience during each pose, we can cultivate a deep sense of presence.

Session 6 (Practical): Practicing walking meditation by walking slowly and deliberately, paying attention to the sensations of the body and the environment, can help cultivate a sense of calm, focus, and connection with the present moment.

Session 7 (Practical): Practicing breath awareness meditation focuses on paying attention to the breath as it naturally unfolds. This practice teaches us to observe the breath with nonjudgmental awareness, enhancing our ability to stay grounded and centered amidst life's challenges.

Session 8 (Practical): Practicing mindful eating by developing a healthier relationship with food, avoiding emotional or mindless eating, and making more conscious choices about what and how much we consume. We can develop a healthier relationship with food,

avoid emotional or mindless eating, and make more conscious choices about what and how much we consume.

Session 9 (**Practical):** Practicing loving-kindness meditation is a practice that involves directing thoughts and feelings of love, kindness, and compassion towards us, our loved ones, and eventually all beings. This technique helps cultivate positive emotions and reduces negative thoughts and judgments. By focusing on sending unconditional love and good wishes to us and others, we develop a sense of connection and empathy.

Session 10 (**Ending Session):** Reviewing the skills taught during the sessions and measuring the program's impact.

III: Evaluation phase: (post-test)

Using the same format of pre-test tools that were used to assess the impact of the mindfulness-based stress reduction program on pregnant women's anxiety, depression, and sleep quality during the antenatal period, an evaluation was conducted during this phase, one month after the program's implementation.

IV. Statistical Design

IBM SPSS software package version 20.0 was used to feed data into the computer and analyze it (Armonk, NY: IBM Corp). Numbers and percentages were used to describe qualitative data. The mean and standard deviation were used to convey quantitative data.

Table 1 showed that 44% of the studied pregnant women were between 24 and 30 years old, 50% of them had a university education. Regarding pregnancy period, 42 % of pregnant women were more than 35 weeks of pregnancy, 82.0% of them had enough family income, 86.0% of pregnant women had employee and 68.0% of them had family support. The table also showed that 46.0% of pregnant women were suffered from high stress associated with pregnancy

Concerning time of sleep per day, 38% of them were sleep from 4-6 hours. 54% of participants were performed moderate physical activity and 70% of them had previous medical history.

Figure 1 revealed that 28% of the pregnant women had suffered from severe anxiety prior to the implementation of the program, compared to all of them improved from sever anxiety post-implementation. This figure covered the first research hypothesis.

Table 2 revealed that 90% of the pregnant women had suffered from moderate depression prior to the implementation of the program, compared to 34% of them having moderate depression post-implementation. This figure covered the first research hypothesis.

Figure 2 revealed that 82% of the pregnant women had poor sleep quality before the implementation of the program, compared to 34% of

them having poor sleep quality post-implementation. This figure covered the second research hypothesis.

Table 3 demonstrated that Pregnant women's anxiety scores and the Pittsburgh Sleep Quality Index showed a strong positive correlation in both the pre-test and post-test (p=<0.001* and 0.016*, respectively). The Pittsburgh Sleep Quality Index and the depression score of pregnant women were significantly positively correlated in both the pre-test and post-test (p=0.026* and 0.010*, respectively). Additionally, the table showed that pregnant women's anxiety and depression ratings in the pre-test and post-test had a negative correlation (p=0.233 and 0.114, respectively).

Table 4 revealed a highly statistically significant association between pregnant women's age, pregnancy period per week, family income, stress associated with pregnancy, and their anxiety pretest P = (0.015, 0.049, 0.006, 0.003) respectively.

There is a statistically significant association between pregnant women's stress associated with pregnancy and their anxiety posttest P = (0.031). Furthermore, there is statistically significant association between pregnant women' Pregnancy period per week and their depression posttest P = (0.001) Also, the table demonstrated that a highly statistically significant association between pregnant women' Pregnancy period per week and their sleep quality pretest P = (0.008) respectively

Table 5 revealed multivariate linear regression between pregnant women's age, stress associated with pregnancy, and improvement of their anxiety (P = 0.024*, 0.007*), respectively.

Table (1): Distribution of the studied women according to personal data (n = 50)

| personal data	No.	%
Age		
18<24	14	28.0
24 <30	22	44.0
30 ≤40	14	28.0
Education level		
Basic education	5	10.0
Secondary education	20	40.0
University education	25	50.0
Pregnancy period per week		
<12 Week	8	16.0
12 – 24 Week	5	10.0
25 – 35 Week	16	32.0
>35 Week	21	42.0
Family income		
Not enough	5	10.0
Enough	41	82.0
Enough and save	4	8.0
Occupational status		
Employee	43	86.0
Not employee	7	14.0
Family support		
There is family support	34	68.0
There is no family support	16	32.0
Stress associated with pregnancy		
Low	5	10.0
Moderate	22	44.0
High	23	46.0
Number of hours of sleep per day		
<4 Hours	6	12.0
4 – 6 Hours	19	38.0
6 – 8 Hours	13	26.0
>8 Hours	12	24.0
Level of physical activity		
Light physical activity	10	20.0
Moderate physical activity	27	54.0
Intense physical activity	13	26.0
Previous medical history		
No	15	30.0
Yes	35	70.0
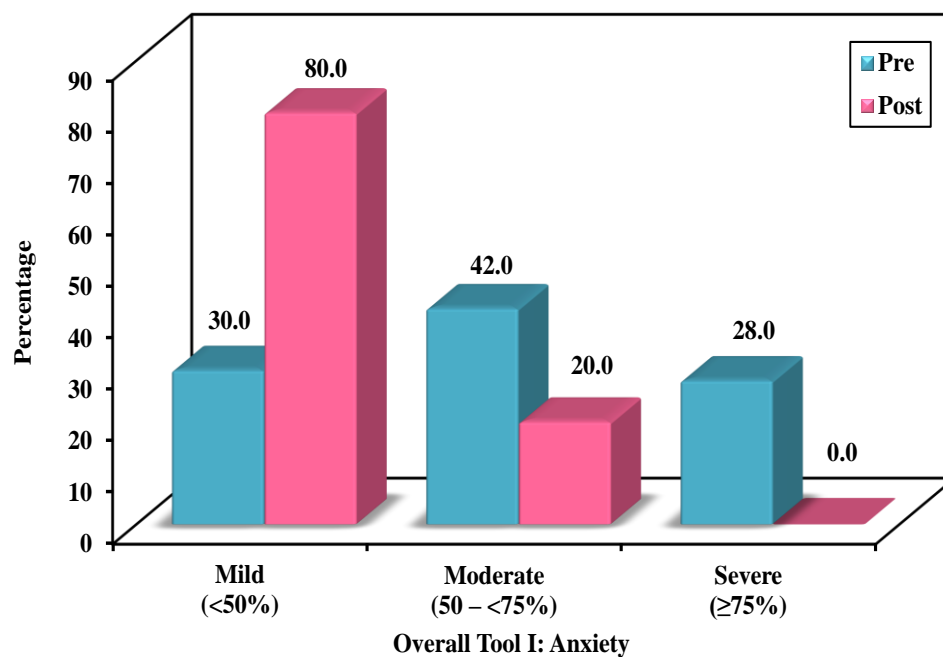
Figure 1: Comparison of the studied women between pre and post according to overall Anxiety (n = 50)

Table (2): Comparison of the studied women between pre and post according to overall Depression (n = 50)

Tool II: Depression	Pre		Post		Test of Sig.	P
	No.	%	No.	%		
Mild (<50%)	5	10.0	33	66.0	McN= 26.036[*]	<0.001[*]
Moderate (50 – <75%)	45	90.0	17	34.0		
Total Score (0 – 30) Min. – Max. Mean ± SD.	13.0 – 22.0 17.26 ± 2.22		11.0 – 21.0 15.06 ± 2.88		t= 6.165[*]	<0.001[*]

SD: **Standard deviation**   **t: Paired t-test**
p: p value for comparing between two studied periods
*: Statistically significant at p ≤ 0.05

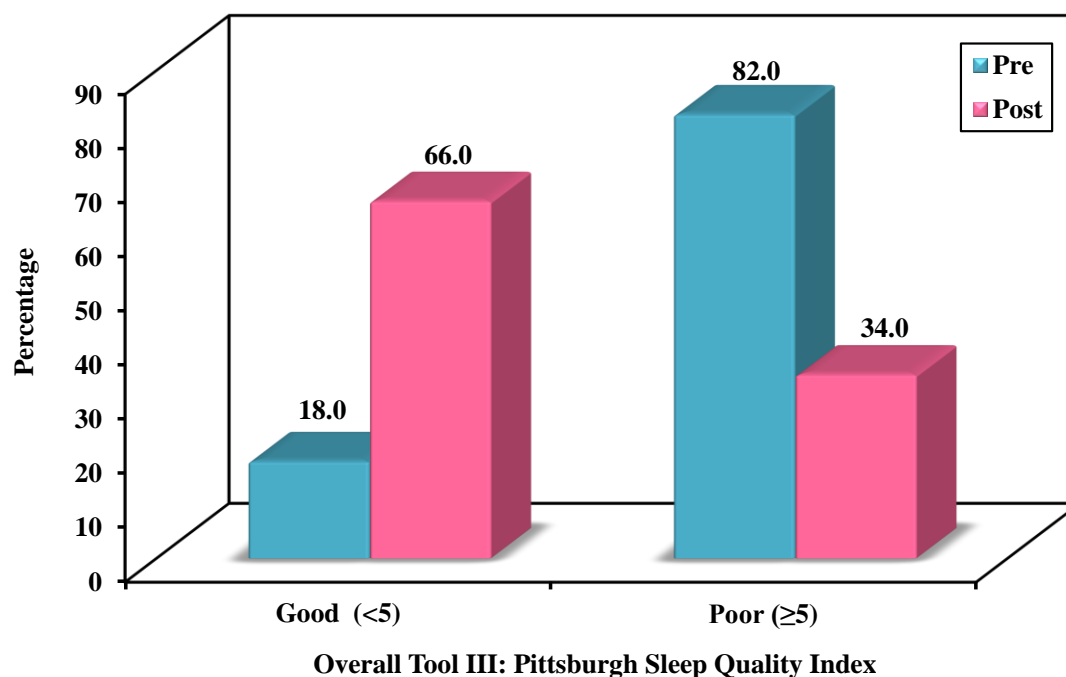Overall Tool III: Pittsburgh Sleep Quality Index

Figure (2): Comparison of the studied women between pre and post according to Overall Sleep Quality (n = 50)

Table (3): Correlation between overall Anxiety, Depression and Sleep Quality (n = 50)

Variable Scales		Pre	Post
Anxiety vs. Depression	r	-0.172	-0.226
	p	0.233	0.114
Anxiety vs. Pittsburgh sleep quality index	r	0.492	0.339
	p	<0.001[*]	0.016[*]
Depression vs. Pittsburgh sleep quality index	r	0.315[*]	-0.363
	p	0.026[*]	0.010[*]

Table (4): Relation between total score for Anxiety, Depression and Pittsburgh sleep quality index with personal data (n = 50)

	Anxiety		Depression		Pittsburgh sleep quality index	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**
	Mean ± SD.	**Mean ± SD.**	**Mean ± SD.**	**Mean ± SD.**	**Mean ± SD.**	**Mean ± SD.**
Age						
18<24	18.29 ± 6.26	12.64 ± 3.69	17.57 ± 1.65	14.71 ± 2.97	8.0 ± 3.51	5.10 ± 2.69
24 <30	14.36 ± 7.09	9.86 ± 4.78	17.41 ± 2.48	15.77 ± 3.05	7.51 ± 2.60	4.48 ± 2.55
30 ≤40	21.43 ± 7.36	12.14 ± 2.71	16.71 ± 2.33	14.29 ± 2.40	8.78 ± 3.28	5.34 ± 2.25
(p)	**(0.015*)**	**(0.092)**	**(0.553)**	**(0.284)**	**(0.485)**	**(0.570)**
Education level						
Basic education	18.60 ± 5.94	13.20 ± 4.32	14.80 ± 2.39	17.20 ± 2.68	8.30 ± 1.53	5.82 ± 3.25
Secondary education	15.30 ± 6.77	10.15 ± 3.83	14.60 ± 2.93	17.00 ± 2.34	7.54 ± 2.73	4.52 ± 2.07
University education	18.92 ± 8.02	11.80 ± 4.23	15.48 ± 2.97	17.48 ± 2.10	8.32 ± 3.52	5.01 ± 2.68
(p)	**(0.255)**	**(0.229)**	**(0.777)**	**(0.592)**	**(0.690)**	**(0.559)**
Pregnancy period per week						
<12 Week	23.25 ± 6.36	14.50 ± 2.62	16.0 ± 1.60	15.13 ± 1.89	9.18 ± 3.32	5.19 ± 3.36
12 – 24 Week	14.60 ± 11.06	9.80 ± 6.06	16.40 ± 2.19	13.40 ± 2.61	6.47 ± 2.66	6.48 ± 2.68
25 – 35 Week	14.88 ± 4.84	10.44 ± 2.25	17.0 ± 1.93	13.38 ± 2.06	6.29 ± 2.49	4.78 ± 1.92
>35 Week	17.86 ± 7.63	11.05 ± 4.78	18.14 ± 2.39	16.71 ± 2.95	9.23 ± 2.79	4.50 ± 2.49
(p)	**(0.049*)**	**(0.096)**	**(0.071)**	**(0.001*)**	**(0.008*)**	**(0.450)**
Family income						
Not enough	26.60 ± 5.08	15.40 ± 2.88	16.20 ± 1.64	14.20 ± 2.28	9.36 ± 2.67	5.60 ± 3.52
Enough	16.05 ± 6.93	10.80 ± 4.16	17.22 ± 2.27	15.17 ± 3.04	7.83 ± 2.98	4.74 ± 2.43
Enough and save	20.25 ± 7.18	11.0 ± 2.16	19.0 ± 1.41	15.0 ± 2.0	8.14 ± 4.48	5.65 ± 1.93
(p)	**(0.006*)**	**(0.059)**	**(0.166)**	**(0.783)**	**(0.574)**	**(0.634)**
Stress associated with pregnancy						
Low	15.80 ± 7.79	11.40 ± 4.39	16.80 ± 2.28	14.60 ± 2.19	5.21 ± 3.24	4.48 ± 2.81
Moderate	13.95 ± 6.51	9.64 ± 4.30	17.23 ± 2.33	15.32 ± 3.58	7.81 ± 2.95	4.25 ± 1.89
High	21.13 ± 6.68	12.83 ± 3.39	17.39 ± 2.19	14.91 ± 2.29	8.80 ± 2.83	5.61 ± 2.82
(p)	**(0.003*)**	**(0.031*)**	**(0.866)**	**(0.839)**	**(0.051)**	**(0.172)**

Table (5): Multivariate linear regression analysis for the parameters affecting improvement for anxiety, depression and sleep quality

	#Multivariate Anxiety		#Multivariate Depression		#Multivariate Pittsburgh sleep quality index	
	P	B (LL – UL 95%C.I)	p	B (LL – UL 95%C.I)	p	B (LL – UL 95%C.I)
Age	0.024[*]	2.149 (0.291 – 4.006)	0.596	-0.263 (-1.257 – 0.730)	0.593	0.361 (-0.992 – 1.715)
Pregnancy period per week	0.341	-0.622 (-1.923 – 0.680)	0.885	-0.050 (-.747 – 0.646)	0.217	0.589 (-0.359 – 1.537)
Family income	0.346	-1.554 (-4.841 – 1.733)	0.256	1.006 (-0.754 – 2.765)	0.499	-0.811 (-3.207 – 1.584)
Stress associated with pregnancy	0.007[*]	3.028 (0.891 – 5.164)	0.580	0.317 (-0.827 – 1.460)	0.536	0.482 (-1.075 – 2.039)

DISCUSSION

Maternal psychological problems are influenced by various factors, but effective treatments are often inaccessible due to time, cost, and insufficient trained therapists. Mindfulness therapy has been introduced to alleviate anxiety, depression, interpersonal communication, personality disorders, and impulse control, showing remarkable efficacy in treating these disorders (**Koffel et al., 2018, Ardi et al., 2021; Roberts et al., 2021).**

The methodical meditation practice known as mindfulness-based stress reduction (MBSR) employs mindfulness practices to control emotions, deal with stress, and advance mental and physical well-

being. Through self-control and inner focus, it successfully reduces psychological stress and has benefits over pharmaceutical treatments (**Simshäuser et al., 2020 and Nourian et al., 2021**). This study aims to investigate impact of a mindfulness-based stress reduction program on prenatal anxiety, depression and sleep quality among primigravida women

1. Levels of Anxiety and Depression

In the light of the current study's findings, the high levels of anxiety and depression that participants reported prior to the intervention (28% with severe anxiety and 90% with moderate depression). These findings are in line with a study **of Dennis et al., (2017**) that discovered the pooled rate of perinatal trait anxiety (ranging from 29.1% to 32.5%) and the rate of perinatal anxiety symptoms (ranging from 18.2% to 24.6%). According to a study by **Xu et al., (2020)**, the incidence of prenatal depression ranges between 20% and 40%. Rates of depression during pregnancy have been reported to reach 7.4% in the first trimester, 12% to 12.8% in the second and third trimesters, and even higher during the first year after delivery.

Furthermore, the results of the current study demonstrated that the intervention considerably decreased anxiety and sadness, and that severe anxiety before the intervention improved after the intervention. This is in line with research by **Zarenejad et al. (2020),** which found that MBSR can help pregnant women feel less anxious. In order to move toward their desired goals, accept their mistakes and decisions without passing judgment, and deal with them quickly by identifying stressful stages and events, people who use MBSR get to know themselves better by identifying their strengths and weaknesses. They also learn coping strategies, commitment, and acceptance **(Nasrollahi et al., 2022).** According to a comprehensive study,

mindfulness helps lessen anxiety and stress associated with pregnancy **(Vázquez-Lara et al., 2025).**

The results of this study demonstrated that MBSR might lessen depression following a first-trimester pregnancy termination. On the other hand, studies based on happiness were able to lower sadness in women who experienced repeated miscarriages. The cognitive and emotional states of patients are improved by a happiness training program. By adjusting to shifting conditions, it enables patients to respond to obstacles with optimism and take on a more positive outlook on life events **(Elsharkawy et al., 2021)**. In order to increase acceptance and contentment in their lives, people with aware minds reflect on the past, examine past occurrences to break negative patterns, adopt new perspectives, and accept circumstances as they are **(Dawood et al., 2025)**.

2. Sleep Quality and Pregnancy

Pregnancy-related sleep problems are quite common and serious. 46% of pregnant women report having poor sleep quality (Pittsburgh Sleep Quality Index scores > 5) according to meta-analytic research **(Felder et al., 2024).** One of the current study's key findings is the notable increase in Pittsburgh Sleep Quality Index (PSQI) ratings, which went from 82% of women reporting poor sleep quality before the intervention to only 34% after. Because inadequate sleep is linked to a higher risk of preterm delivery, cesarean section, maternal depression, pre-eclampsia, gestational diabetes, and poor outcomes for the baby **(Felder, Baer et al., 2022; Lu et al., 2021).**

Learning mindfulness as a coping mechanism and mental relaxation technique to enhance sleep quality is of interest to expectant mothers **(Felder, Mirchandaney, et al., 2022)**. Delivering behavioral sleep techniques from a mindfulness

perspective was linked to improvements in the intensity of insomnia symptoms and cognitive arousal among 12 pregnant women, according to data from a pilot non-randomized experiment (**Kalmbach et al., 2023**). Therefore, new research highlights the potential of mindfulness-based strategies to enhance sleep in this population.

3. Correlations between Anxiety, Depression, and Sleep Quality

The significant correlations found between anxiety, depression, and sleep quality pre- and post-intervention are consistent with existing research. It is well-established that poor sleep quality is often both a cause and a consequence of mental health problems such as anxiety and depression. This supported by the fact that low sleep quality and short sleep duration during pregnancy and the postpartum period are known risk factors for depressive and anxiety symptoms

and vice versa (**Bangsgaard et al., 2025**).

The positive correlation between anxiety and sleep quality pre- and post-test, as well as between depression and sleep, is well-documented in the literature. For instance, **Peltonen et al. (2022)** discovered that both tiredness and sleeplessness were quite prevalent in their sample, which included late gestational week pregnancies. They discovered some particular associations between mood symptoms and sleep problems, as well as between neonatal outcomes and delivery. These results also imply that pregnant women's sleep quality may be enhanced by addressing mental health symptoms like anxiety and sadness.

However, the study's finding of a negative correlation between anxiety and depression (i.e., as anxiety increases, depression decreases, and vice versa) challenges some common understanding of the relationship between these two

conditions. It is important to note that anxiety and depression often co-occur in pregnancy, and the relationship between the two is complex. Some studies argue that the negative correlation observed in this study may reflect individual coping mechanisms, as some women may exhibit more anxiety, while others may present primarily with depression (**Felder & baer et al., 2022**).

4. Relations between Anxiety, Depression, Sleep Quality and personal data

The present study found that pregnant women's age, pregnancy period per week, family income, family support, and pregnancy-related stress were significantly associated with anxiety in the pretest. Additionally, stress remained significantly associated with anxiety in the posttest. According to research by **Bedaso et al. (2021),** pregnant women who had a lot of family support expressed less anxiety and depression. Pregnancy-related anxiety can be lessened when family members are there to provide physical, emotional, and financial assistance. Furthermore, a research by **Zhang et al. (2023)** discovered that pregnant women who felt more supported by their social networks slept better and experienced less symptoms of insomnia. According to a study by **Mislu et al. (2024)**, by the third trimester, more than 75% of expectant mothers report having trouble sleeping because to things like increased anxiety, frequent urination, and physical pain.

Additionally, the current findings indicate that pregnant women's age and stress associated with pregnancy are significant predictors of anxiety improvement, with p-values of 0.024 and 0.007, respectively. These results align a study by **Dunkel Schetter et al. (2020)** found that younger pregnant women often experience higher anxiety due to factors such as limited coping mechanisms and financial instability. However, with

appropriate support and resources, these women can experience significant improvements in anxiety levels as pregnancy progresses. Conversely, older pregnant women may have concerns related to pregnancy complications, which can affect anxiety trajectories differently.

Prenatal stress is a well-established factor influencing maternal anxiety. A systematic review and meta-analysis conducted by **Abera et al. (2022)**, highlighted that relaxation interventions during pregnancy effectively reduce maternal stress and anxiety, leading to improved mental health outcomes. This suggests that addressing pregnancy-related stress through targeted interventions can significantly enhance anxiety improvement among expectant mothers.

Conclusion

According to the current study, it successfully established the efficiency of MBSR in reducing anxiety and depression while improving sleep quality during pregnancy. Participants who engaged in the program reported lower stress levels, enhanced emotional well-being, and improved overall sleep patterns, highlighting the effectiveness of mindfulness practices in managing prenatal psychological distress.

Recommendations

Based on these results, the following recommendations are proposed:

1. **Integration of MBSR in Prenatal Care:** Healthcare providers should incorporate mindfulness-based interventions into routine prenatal care to support maternal mental health and well-being.

2. **Awareness and Training**: Pregnant women and healthcare professionals should be educated on the benefits of MBSR through workshops and training programs.

3. **Further Research:** Future studies should explore the long-term effects of MBSR on maternal and neonatal health, including postpartum outcomes.

4. **Personalized Mindfulness Programs**: Tailoring mindfulness interventions based on individual needs and preferences could enhance their effectiveness and accessibility.

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