



Effect of Benson Relaxation Technique on Blood Pressure and Anxiety among Women with Pregnancy Induced Hypertension.

Magda Ahmed Farhat¹, Mona R Ahmed², Heba Ahmed Galal Atia³, Omnya Sobhy Mohamad El-ayari⁴, Heba Atef Osman⁵

1 lecturer of Obstetric and Gynecological Nursing, Faculty of Nursing, Damanhur University, Egypt.

2 lecturer of Maternity and Newborn health Nursing, Faculty of Nursing, Assiut University, Egypt.

3lecturer of Maternity, Obstetric and Gynecological Nursing, Faculty of Nursing, Suez Canal University, Egypt

4 Lecturer, Psychiatric Nursing & Mental Health, Faculty of Nursing, Kafrelsheikh University, Egypt.

5 Lecturer of Women Health and Obstetrics Nursing ,Facult of Nursing, Minia University.

ABSTRACT

Background: Pregnancy induced hypertension is a major public health issue in both developed and developing countries, contributing to high perinatal mortality rates. **Aim:** To assess effect of Benson's relaxation technique on blood pressure and anxiety among women with Pregnancy Induced Hypertension.

Design: Quasi-experimental design was adopted in this study. **Setting:** It conducted at antenatal Unit of Women Health Hospital, Assuit University. **Sample:** Purposive sample of 50 women with pregnancy induced hypertension.

Tools: **Tool (I)** Structured interviewing questionnaire, **Tool (II)** Blood pressure recording Sheet **&Tool (III)** Hospital Anxiety Scale (HAS)

Results: There is statistically significant difference between pre & post implementation regarding blood pressure and anxiety levels with p-value .000.

Conclusion: Benson relaxation technique was an effective intervention to control blood pressure and reduce anxiety levels for women with pregnancy-induced hypertension.

Recommendations: Nursing staff should include Benson relaxation techniques in the nursing care plan for pregnant women with PIH.

Keywords: Anxiety, Blood pressure, Benson relaxation technique, Pregnancy induced hypertension.

Introduction

Pregnancy induced hypertension (PIH) is a significant contributor to both maternal and perinatal death and morbidity. It accounts for 18% of all maternal fatalities worldwide and impacts 4.2% of women in Egypt. The citation is from

Suhartono et al. (2022). The World Health Organization and the American College of Obstetrics and Gynecology classify pregnancy-induced hypertension (PIH) into three groups. The first group is gestational hypertension, which occurs after the 20th week of pregnancy or within the first 24 hours after delivery. This type of

hypertension is characterized by the absence of proteinuria and edema. Preeclampsia is a condition that typically occurs after the 20th week of pregnancy or within 2 weeks after delivery. It is characterized by high blood pressure ($\geq 140/90$ mmHg), proteinuria (excessive protein in the urine, > 300 mg/L), elevated levels of serum creatinine (> 30 mg/mmol), and edema (swelling).

Eclampsia, on the other hand, is a more severe form of preeclampsia that is accompanied by neurological symptoms such as seizures, hyperreflexia (exaggerated reflexes), headache, visual disturbances, or coma. (Arce-López et al., 2022)

Maternal problems associated with Pregnancy-Induced Hypertension (PIH) include eclampsia, shock, and bleeding. Meanwhile, the potential dangers to the fetus include stillbirth, stunted growth in the womb, lack of oxygen, and being born prematurely. The citation is from Gupta et al. in 2023. Furthermore, a prevalent emotional issue that might occur during a pregnancy with a significant risk is anxiety, which is a reaction to feeling unsafe or endangered (Chan et al., 2020).

Anxiety is characterized as a state of worry or discomfort regarding anything that has an unpredictable result, and it has the capacity to coexist with, cause, or provoke despair. Pregnant women exhibit a higher vulnerability to anxiety, with a prevalence ranging from 15% to 23%, in contrast to a range of 3% to 5% in women who are not pregnant (Sayed et al., 2022). Research has demonstrated that pregnancy anxiety adversely

affects the overall health of the growing fetus and accelerates the occurrence of postnatal depression. Potential risk factors for anxiety during pregnancy include environmental stressors or obligations in everyday life, psychological, physical, and social support, socioeconomic level, and physiological variables such as a high-risk pregnancy and the process of birthing (Konsam et al., 2023).

Relaxation-based interventions are a form of supplementary alternative therapy employed to diminish the activation of the sympathetic nervous system, which is responsible for the "fight or flight" response, and enhance the response of the parasympathetic nervous system, which is responsible for the "rest and digest" response. The main objectives of this approach are to decrease arousal and induce a state of calmness, often achieved through techniques such as regulating breathing, alternating muscle tension and relaxation, or focusing the mind on positive ideas. The citation is from Ginsberg et al. (2023).

The Benson relaxation method (BRM) is a non-pharmacological behavioral technique used for anxiety management. BRM is a highly accessible relaxation technique that may be easily learned and effectively applied to a particular patient. The subsequent are the sequential procedures included in a standard BRM session: Assume a comfortable posture, close the eyes, completely relax all the muscles, beginning with the lower limbs and progressing to the face, inhale through the nostrils while being mindful of one's own breath, and repeat this routine for a duration of 20 minutes. After a period of time, the individual settles down

and remains still, first with their eyes closed and subsequently with their eyes open. (Gaber et al., 2022).

Significance of the study

The most common cause of maternal morbidity is pregnancy-induced hypertension (PIH). According to a previous study, PIH affects 5.1% of pregnancies. Furthermore, hypertensive disorders of pregnancy account for approximately 15% of all maternal deaths worldwide nearly 30,000 deaths per year (Song et al., 2023).

Pregnancy-induced hypertension is responsible for around 18% of global maternal fatalities, leading to an estimated annual death toll of 62,000 to 77,000. It results in complications in 4.2 percent of pregnancies in Egypt. Utilizing established healthcare strategies to prevent or manage problems can effectively mitigate the overwhelming majority of maternal death cases. The utilization of Benson relaxation in a hospital's pregnancy induced hypertension program results in a reduced need for pharmacological medicines, while also minimizing the occurrence of adverse effects. The citation (Suhartono et al., 2022)

The aim of this study was to examine how the Benson relaxation technique affected anxiety and blood pressure in women suffering from pregnancy-induced hypertension, to produce firm research finding for using it as an empirically supported nursing strategy in these women.

Aim of the study was to assess effect of Benson's relaxation technique on blood pressure

and anxiety among women with Pregnancy Induced Hypertension through the following objectives:

1-Assessing anxiety levels in women with PIH

2-Implementing Benson's relaxation technique

3-Evaluating effect of Benson's relaxation technique on blood pressure and anxiety levels.

Research hypotheses:

H0: Benson's relaxation technique will not have any effect on blood pressure and anxiety levels among women with PIH

H1: Women with PIH will have lower post-test mean systolic and diastolic blood pressure scores than pre -test mean scores following Benson relaxation technique

H2: Women with PIH will have lower post-test mean anxiety scores than pre -test mean scores following Benson relaxation technique

Subjects and Method

Research design:

A quasi-experimental design with pre and post-test was adopted to accomplish the stated aim.

Operational definitions

Pregnancy-Induced Hypertension (PIH): is operationally defined in this study as elevated blood pressure levels (> 140/90 mmHg) occurring after the 20th week of pregnancy.

Benson's Relaxation Therapy: is delineated in this study as Dr. Benson's recommended systematic and consistent breathing practices, steps, and techniques aimed at substantially reducing blood pressure. This involves easing the tension in the muscles surrounding constricted blood vessels through a regimen of 20-minute sessions, administered three times a day over a period of three days.

Study setting:

The research was conducted at the Antenatal Unit of Women's Health Hospital, specializing in high-risk pregnancies. The Women's Health Hospital provides the services to the whole Upper Egypt region. It is a six-story building with five floors designated for governmental entry and one floor designated for private entry.

Study Sample:

Purposive sampling was employed, involving a selection of 50 women diagnosed with Pregnancy-Induced Hypertension (PIH) and hospitalized.

Sample size calculation

The sample size was calculated using (Epi-info statistical package, version 7.2, designed by the CDC (Centre for Disease Control and Prevention) with 80 percent power, a value of 2.5 is chosen at the acceptable limit of precision (D) at 95 percent confidence level (C1), with expected prevalence 10%, worst acceptable 25%.

Inclusion criteria:

- Women with Pregnancy-induced hypertension
- No other medical issues.
- No psychiatric disorders
- Hospitalized for at least three consecutive days

Tools of data collection:

Three tools were used to collect the data:

Tool (I): Structured interviewing questionnaire:

It divided into two parts as follows:

1st Part: included personal data such as the woman's age, education, occupation, residency.

2nd Part: included Obstetric history as number of paras, gravida, abortion, stillbirths, living children & weeks of gestations.

Tool (II): Blood pressure recording Sheet: It was made by the researcher to evaluate blood pressure.

Tool (III): Hospital Anxiety Scale (HAS):

This scale was inspired by (**Zigmond & Snaith, 1983**) and adopted by researcher to assess anxiety level of women with pregnancy induced hypertension. It was a 14-item scale with two subscales, one to measure anxiety and one to measure depression. The researcher used only the anxiety subscale that consisted of seven items. Where women were asked to choose one of four responses for each item graded from 0 to 3. The total score of 21 was divided into four categories.

- Normal level (0 to 7)

- Mild level (8 to 10)
- Moderate level (11 to 15)
- Severity level (16 to 21).

Ethical consideration: The Assuit University Faculty of Nursing's Research Ethics Committee approved the study with code No. (1120240688). The participants were informed that their participation was entirely voluntary. The study's aim was explained to all participants by the researcher. They were assured that all obtained data would be kept confidential and used solely for the study. Prior to enrollment, the women gave verbal informed consent.

Pilot study:

A pilot sample of 10% of the participants (5 women) was taken to assess the questionnaire's clarity, integrity, and to calculate the duration required for collecting the data. There was no modification, and the pilot sample was included in the overall sample.

Fieldwork:

Procedures

The study took place over four months from September 2023 to December 2023 and was divided into four phases: planning and preparation, assessment, implementation, and evaluation.

1- Planning &Preparation phase

During this phase, the researcher conducted a comprehensive review of both domestic and global literature, along with many studies pertaining to

the subject of the study, utilizing various sources such as publications, online resources, academic journals, and magazines. This also facilitated the development of research instruments. A film and instructional resources were developed to disseminate information about PIH (Pregnancy-Induced Hypertension) and the specific procedures included in the Benson relaxation technique. In order to ensure the effective implementation of the Benson relaxation technique, the researcher sought instruction and training from a mental relaxation therapist on how to properly execute the technique.

2-Assessment phase

In this phase, each woman was interviewed face to face for 30 minutes to assess basic data using the developed interviewing questionnaire; as personal data, obstetric history and pre-test Blood pressure recording Sheet & Hospital Anxiety Scale (HAS) were also assessed face to face to obtain pretest blood pressure and anxiety level.

3-Implementation phase

While each woman was watching a video, the researcher demonstrated Benson relaxation technique for each woman individually. The woman then asked to apply it again. The Benson relaxation technique was implemented using the steps outlined below.

- 1-Sit in a comfortable position.
- 2-Select a focus word (for example, "one").
- 3-Close eyes.

4- Gradually relax all of muscles, beginning with toes and feet and progressing to the entire body

5-Take naturally and slowly breaths through nose to inhale from three to five seconds, pause from three to five seconds, repeat the targeted words or phrases silently as she exhales from three to five seconds.

The preceding steps were repeated for 10-20 minutes. Benson relaxation was performed twice daily, three hours apart, for three days in a row.

4-Evaluation phase

To assess effect of Benson relaxation technique on blood pressure and anxiety, Blood pressure & anxiety levels were evaluated after completing the sessions of the three days using the same tools.

Results

Table (1): Displays the studied women's personal data. It reveals that nearly half (48%) of the women were between the ages of 30 and 35. The mean age was 29.5 ± 5.8 . In terms of residence, more than two-thirds (80%) of the studied women live in rural areas. When it comes to education, nearly half (40%) of the women have a secondary education. Furthermore, more than two-thirds (72%) of women are unemployed.

Table (2): Reveals the obstetric history and clarifies that (50%) of the studied women had gravida between 3 -4 and (60%) of the studied women had para between 3-4 and 3to 4 living children.

Figure (1): Shows that history of pregnancy induced hypertension and polyhydramnios were the most common risk factors for pregnancy induced hypertension in the studied women (50%), (32%) respectively.

Table (3): Demonstrates a highly statistically significant differences between pre and post implementation mean scores of systolic and diastolic blood pressure among women ($p=0.000^{**}$) with a significant decrease of the total mean score of systolic blood pressure level from pre-test (158.2 ± 9.6) to (144.5 ± 1.4) in post-test and diastolic blood pressure level from pretest (106.9 ± 9.7) to (90.9 ± 1.8) in post-test among the studied women.

Figure (2): Demonstrates a highly statistically significant difference in women's level of blood pressure in pre- and post-test, with a p-value of 0.000. Whereas (76%) of the women had Stage II ($>160/110-180/150$) in the pre-test, more than three quarters (90%) of the women had stage I ($>140/90-150/100$) in the post-test.

Table (4): Shows a highly statistically significant difference in women's anxiety level in the pre- and post-test, with a p-value of 0.000. where the majority of the women have moderate and severe level of anxiety (40%) (54%) respectively in pre-implementation while in post-implementation nearly two thirds (60%) of the women have normal level of anxiety.

Figure (3): Shows a highly statistically significant difference in women's anxiety level in pre- and post-test p-value 0.000.

Table (1) Percentage distribution of personal data of the studied women (N=50).

Personal data	N (50)	%
Age group / years		
Less than 25 yrs.	20	40
30 -35yrs.	24	48
More than 30 yrs.	6	12
Age mean and SD	29.5±5.8	
women' education:		
Illiterate	5	10
read and write	13	26
Basic education	12	24
Secondary education	20	40
Residency:		
urban	10	20
Rural	40	80
Women' working status:		
Employed	14	28
Unemployed	36	72

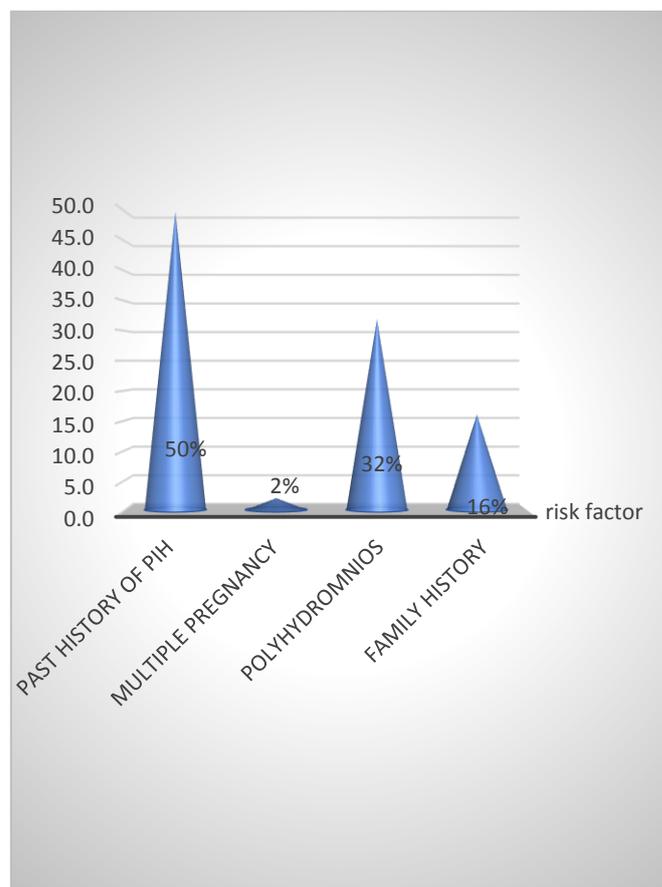


Figure 1: Percentage distribution of the studied women according to their risk factors for pregnancy induced hypertension (N=50).

Table (2) Distribution of the studied women according to their obstetrical history N=50

Variables	Studied women (N=50)	
	No	%
Gravidity: Mean ± SD	4.6±1.195	
• Less than three	1	2
• 3-4	25	50
• 5 and more than 5	24	48
Parity: Mean ± SD	3.5±1.28	
• Less than three	10	20
• 3-4	30	60
• 5 and more than 5	10	20
Number of living children: Mean ± SD	3.5±1.28	
• Less than three	10	20
• 3-4	30	60
• 5 and more than 5	10	20
Number of abortions:		
• None	43	86
• One time	7	14

Table (3): The mean and standard deviation of systolic and diastolic blood pressure in pre- and post- test among the studied women (N=50).

Variable	pre	post	P-value
	Mean ±SD	Mean ±SD	
Systolic Bp	158.2±9.6	144.5 ±1.4	.000 **
Diastolic Bp	106.9±9.7	90.9±1.8	.000**

(**) highly statistically significant difference

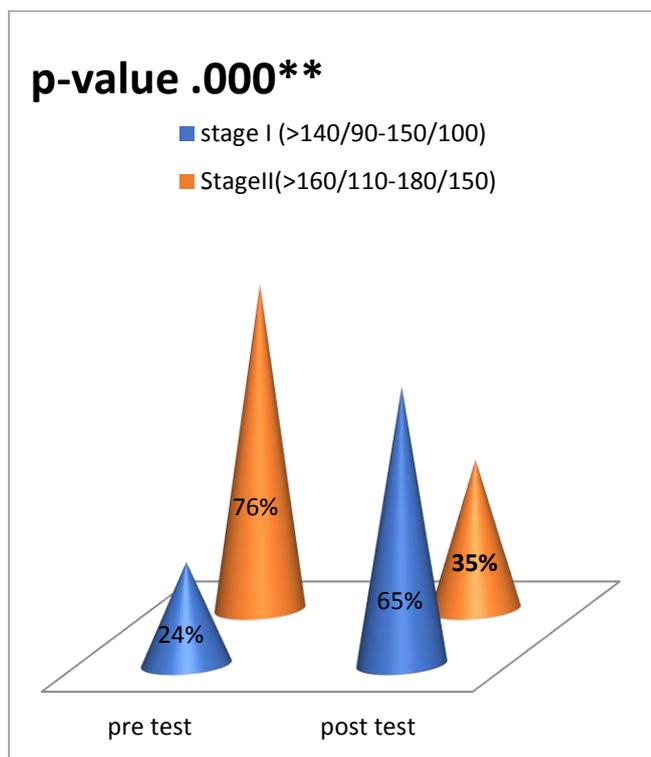


Figure (2): Percentage distribution of women's level of blood pressure in pre-test and post-test (N=50).

Table (4): Percentage distribution of women's level of anxiety in pre-test and post-test (N=50).

Variable	pre		post		P-value
	No	%	No	%	
Normal (0-7)	0	0	30	60	.000 **
Mild (8-10)	3	6	10	20	
Moderate (11-15)	20	40	8	16	
Severe (16-21)	27	54	2	4	

(**) highly statistically significant difference

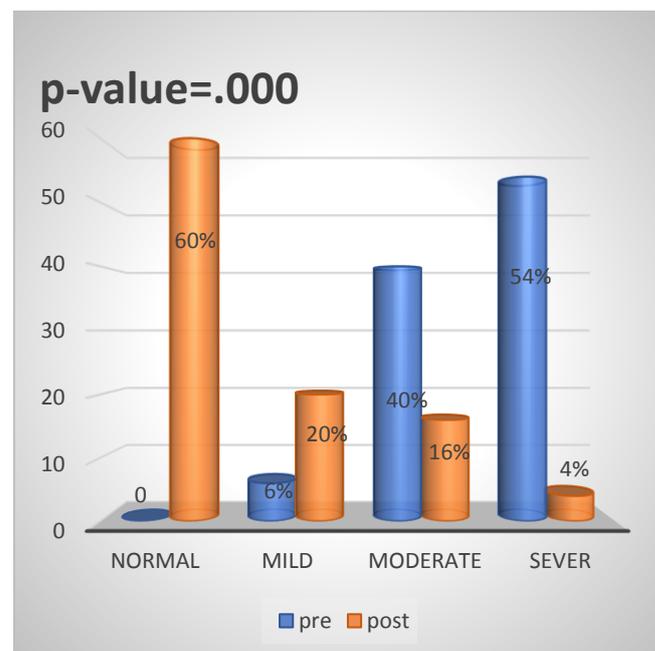


Figure 3: Percentage distribution of women's total anxiety level in pre-test and post-test (N=50).

Discussion

Pregnancy-induced hypertension poses significant risks to both the maternal and fetal health, increasing the likelihood of developing preeclampsia and precipitating psychological complications such as worry. Benson Relaxation techniques can reduce the activity of the sympathetic nervous system, leading to the dilation of arteries and improving the supply of oxygen and blood to bodily tissues. Additionally, it can aid in the regulation of blood pressure and the management of anxiety. (Babu et al., 2019). The current study aimed to evaluate the impact of Benson's relaxation technique on blood pressure and anxiety levels in women diagnosed with Pregnancy Induced Hypertension.

Regarding to the mean scores of systolic and diastolic blood pressure levels among the studied

women at pre- and post-implementation of the Benson relaxation technique. There were highly statistically significant differences between pre and post implementation mean scores of blood pressure level among women ($p=0.000^{**}$) with a significant increase of the total mean score of systolic blood pressure level from pre-test (158.2 ± 9.6) to (144.5 ± 1.4) in post-test and diastolic blood pressure level from pretest (106.9 ± 9.7) to (90.9 ± 1.8) in post-test among the studied women.

These results align with the findings of Gupta et al. (2022), who conducted a study in Shimla. Their study aimed to assess the beneficial effects of Benson's relaxation therapy on blood pressure in pregnant women with Pregnancy Induced Hypertension (PIH). The researchers observed notable differences in blood pressure levels before and after the intervention among mothers with PIH in both the study and control groups.

Also with (Ibrahim et al.,2022) who did their study in port said city, Egypt to examine the impacts of the Benson relaxation technique on physiological variables, anxiety, and sleep quality in gestational hypertensive women, and found a statistically significant distinction ($p=.001$) in mean blood pressure level scores in the study group compared to no significant distinction in the control group. and Benson relaxation may be employed to improve physiologic variables and reduce anxiety levels in pre-eclamptic women.

Also, with (Abd Elgwad et al., 2021) who conducted their study in Alexandria, Egypt to

determine the influence of Benson's relaxation therapy on stress and vital signs in pre-eclamptic women and concluded that Benson relaxation can be employed to improve vital signs while lowering stress levels in pre-eclamptic women

This could be attributed to the fact that muscle relaxation diminishes the intake of oxygen and raises CO₂ removal, both resulting in lowering blood pressure.

Regarding the levels of anxiety among the studied women at pre- and post-implementation of the Benson relaxation technique. There were statistically significant differences between pre and post -implementation of the Benson relaxation technique regarding level of anxiety ($p=0.000^{**}$). Where the majority of the women have moderate and severe level of anxiety in pre-implementation while in post-implementation nearly two thirds of the women have normal level of anxiety.

This was consistent with (Ibrahim et al.,2022) who noted a statistically significant disparity in anxiety levels between the study and control groups with ($P =0.000^{*}$).

Also (Ibrahim et al.,2019) discovered that those who acquired Benson relaxation techniques experienced a more substantial decrease in anxiety compared to those who did not.

Also (Mohammadi & Parandin .,2019) who did their research in Iran and observed that integrating the Benson relaxation technique (BRT) with a brief psycho-educational intervention (BPI) can assist pregnant women minimize unfavorable

psychological manifestations such as anxiety and stress. This result can be linked to muscle relaxation boosting the release of natural opioids (endorphins), which alleviate anxiety and mental stress in pregnant women.

Conclusion

The Benson relaxation technique demonstrated efficacy as an intervention for women with pregnancy-induced hypertension in terms of blood pressure regulation and anxiety alleviation.

Recommendations

- Benson relaxation techniques should be incorporated in the nursing care plan for pregnant women experiencing PIH.
- Nurses should receive training in the form of workshops and seminars to educate them on the benefits of the Benson relaxation technique and how to apply it.
- To ensure that the findings are more generalizable, future studies should be done on a larger number of participants and a wider geographical region.

References

Abd Elgwad, F., Mourad, M., & Mahmoud, N. (2021). Effect of Benson's Relaxation Therapy on Stress and Physiological Parameters among Women with Preeclampsia. *Alexandria Scientific Nursing Journal*, 23(1), 63-74.

Arce-López, K. L., Iglesias-Leboreiro, J., Bernárdez-Zapata, I., Rendón-Macías, M. E., & Miranda Madrazo, M. R. (2022). Hematological disorders in preterm newborns born to mothers with pregnancy-induced

hypertension. *Boletín médico del Hospital Infantil de México*, 79(6), 363-368.

Babu, A., Aswathy S., & Krishnapillai, V. (2019). Prevalence and determinants of somatization and anxiety among adult women in an urban population in Kerala. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*, 44(Suppl 1), S66.

Chan, C., Lee, A., Koh, Y., Lam, S., Lee, C., Leung, K., & Tang, C. (2020). Associations of body dissatisfaction with anxiety and depression in the pregnancy and postpartum periods: A longitudinal study. *Journal of affective disorders*, 263, 582-592.

Dias, P., Pourová, J., Vopršalová, M., Nejmanová, I., & Mladěnka, P. (2022). Hydroxyphenylacetic Acid: A Blood Pressure- Reducing Flavonoid Metabolite. *Nutrients*, 14(2), 328.

Gaber Zaghoul, M., Saied Hassan, S., Saraya, A. A. E. F. A., Mousaad Nosier Abd Elmasieh, H., & Fawzy El Sayed Ali, H. (2022). Effect of Benson Relaxation Technique on Pain Intensity, Anxiety Level and Sleep Quality among Post Caesarean Women. *Egyptian Journal of Health Care*, 13(3), 1002-1013

Ginsberg, K. H., Alsweller, J., Alyami, M., & Serlachius, A. (2023). Mindfulness and Relaxation-Based Interventions to Reduce Parental Stress, Anxiety and/or Depressive Symptoms in the Neonatal Intensive Care Unit: A Systematic Review. *Journal of clinical psychology in medical settings*, 30(2), 387-402.

Gupta, R., Chauhan, K., & Ranaut, V. (2022). Effectiveness of benson's relaxation therapy on blood pressure among antenatal mothers with pregnancy induced hypertension (PIH): an interventional study. *international journal of scientific research*.

Ibrahim, A., Koyuncu, G., Koyuncu, N., Suzer, N., Cakir, O., & Karcioglu, O. (2019): The effect of Benson relaxation method on anxiety in the emergency care. *Medicine*, 98(21).

Ibrahim, S. S., Ebeid, I. A. E. S., El-Aty, A., & Mostafa, E. (2022). Efficacy of benson relaxation

technique on physiological parameters, anxiety, and sleep quality among gestational hypertensive women. *Assiut Scientific Nursing Journal*, 10(29), 14-25

Konsam M, D'Souza SRB, Praharaj SK, et al. (2023). Effectiveness of Music on Perinatal Anxiety Among Pregnant Women and Newborn Behaviors: A Systematic Review and Narrative Synthesis. *Indian Journal of Psychological Medicine*;0(0). doi:10.1177/02537176231167077

Mohammadi, M. M., & Parandin, S. (2019). Effect of the combination of Benson's relaxation technique and brief psychoeducational intervention on multidimensional pain and negative psychological symptoms of pregnant women: A randomized controlled trial. *Journal of education and health promotion*, 8, 91. https://doi.org/10.4103/jehp.jehp_286_18

Sayed, M S., R Ahmed, M., Hussein Ahmed, N., El-Wardany Aly, S., Abdelrahim Khalaf, S., & Mohamed Abd El-Aziz, A. (2022). Relation between psychological problems, fear and anxiety, with COVID-19 pandemic and the quality of life among pregnant women. *International Egyptian Journal of Nursing Sciences and Research*, 3(1), 59-77.

Song, Y. X., He, L. P., & Li, C. P. (2023). The relationship between serum calcium level and risk factor of pregnancy-induced hypertension: a meta-analysis. *Clinical and Experimental Obstetrics & Gynecology*, 50(3), 66.

Suhartono, S., Kartini, A., Budiyo, B., & Darundiati, Y. (2022): The Differences in Blood Lead Levels in Women with Gestational Hypertension or Pre-Eclampsia and Women with Normal Pregnancy (A Study in the North Coast of Java, Brebes District). *JURNAL KESEHATAN LINGKUNGAN*, 14(1), 27-36.

Zigmond AS, Snaith RP. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatr Scand*;67,361-370.