

## **Efficacy of Benson Relaxation Technique on Physiological Parameters, Anxiety and Sleep Quality among Gestational Hypertensive Women**

Seham Shehata Ibrahim<sup>1</sup>, Inas Abd El-Sattar Ebeid<sup>2</sup> & Esraa Mostafa Abd El-Aty<sup>3</sup>

<sup>1</sup>. Assistant Professor of Maternity, Gynecology & Obstetrics Nursing, Faculty of Nursing, Port-Said University, Egypt.

<sup>2</sup>. Lecturer of Psychiatric Nursing and Mental Health, Faculty of Nursing, Port-Said University, Egypt.

<sup>3</sup>. Lecturer of Maternity, Gynecology and Obstetrics Nursing, Faculty of Nursing, Port-Said University, Egypt.

### **Abstract**

**Background:** Gestational hypertension is common all over the world, although it is more common in developing nations and it's an unexpected, multi-organ illness that linked to a lot of maternal and fetal illness and mortality. **Aim:** Assess the effect of Benson relaxation technique on physiological parameters, anxiety and sleep quality among gestational hypertensive women. **Design:** Quasi experimental study was used. **Setting:** All obstetrics hospitals in Port Said city. **Subjects:** Purposive sample of 160 pregnant women with gestational hypertension were randomly divided into two equal groups. **Tools of the study:** Four tools were used: Structured interviewing questionnaire, a sheet of physiological measures, hospital anxiety scale (HAS) and the Groningen sleep quality scale (GSQS). **Results:** The difference between before and after the intervention regarding vital signs in the study group was statistically significant ( $p=0.001$ ), but not statistically significant in comparison to control group. Also, mean score of Benson relaxation technique for anxiety level in study group was  $8.475 \pm 4.353$  compared to  $36.500 \pm 7.865$  in control group, with a statistically significant between them ( $P = 0.000^*$ ). Furthermore, mean score of Benson relaxation technique for sleep quality in study group was  $4.53 \pm 0.46$  compared to  $8.32 \pm 0.38$  in control group, with a statistically significant between them ( $P = 0.001^*$ ). **Conclusion:** Benson relaxation can be utilized as an useful strategy to improve in physiological parameters, sleep quality, and decrease anxiety levels in gestational hypertensive women. **Recommendation:** The Benson relaxation therapy is an effective therapeutic approach for gestational hypertensive women and should included in their nursing care plan.

**Keywords:** *Anxiety, Benson relaxation Technique, Gestational Hypertension, Physiological Parameters & Sleep Quality.*

### **Introduction**

Gestational hypertension is a stressful and distressing pathological condition described as a prolonged rise in blood pressure to 140/90 mm Hg or higher on at least two times, four hours apart, after the 20th week of pregnancy (Lowdermilk et al., 2016). It's a major public health concern in both industrialized and developing countries, contributing to a high rate of perinatal mortality. Globally, it represents 18 percent of maternal deaths and affects 4.2 percent of Egyptian women (Suhartono et al., 2022).

According to WHO (2019) the maternal death rate is 45 per 100,000 live births. In addition, the short- and long-term risks of mother-fetal problems rise. This includes a two- to four-fold increased risk of long-term high blood pressure, a doubling of the risk of cardiovascular death and significant adverse cardiovascular events, and a one-and-a-half-fold increased risk of stroke for the mother. Intrauterine growth retardation, foetal discomfort, iatrogenic preterm birth, placental detachment, oligohydramnios, and intrauterine foetal death are all dangers for the embryo (Fox et al., 2019).

Expectant women in this critical situation of having a high-risk pregnancy are at risk of developing alarmingly high levels of anxiety due to the psychosocial stress of facing a seriously life-threatening situation while also being abruptly removed from their support system and familiar surroundings. Furthermore, women with high-risk pregnancies are susceptible to emotional exhaustion, as well as sense of discomfort and worry about their own lives and the lives of their children, which can lead to elevated and distracting levels of anxiety (McCoyd et al., 2020).

One of the disturbing but normal psychological problems that can arise during a high-risk pregnancy is anxiety, which is a natural reaction to feeling unsafe or threatened. Changes in the secretion of vasoactive hormones or other neuroendocrine transmitters cause it to be produced biologically, which can lead to an increased risk of gestational hypertension. Furthermore, there are physiological changes in the mother's body weight, size, and capacities as a result of rapid trimester-specific changes, which frequently causes discomfort and

results in body and self-dissatisfaction. Increased perinatal anxiety symptoms and prenatal anxiety have been linked to this dissatisfaction (Chan et al., 2020). The pregnant woman's daily functions and activities are hampered by high and persistent sensations of anxiety and unease. Furthermore, anxiety can have a significant impact on a pregnant woman's mental health, manifesting as nervousness, restlessness, or tenseness, a sense of approaching danger, and difficulty concentrating (Green et al., 2019). According to previous research, high levels of anxiety during pregnancy are extremely harmful and raise the risk of gestational hypertension, premature birth and low birth weight, as well as strongly documented alterations in foetal brain shape (Mauren & LP, 2022). High maternal anxiety may also result in foetal loss, stunted foetal growth, and hypoxia. Infants of mothers with high maternal anxiety have been shown to have decreased foetal bonding and attachment, as well as long-term behavioural, emotional, and cognitive difficulties as toddlers and even into adolescence (Moore et al., 2017).

Another issue that can arise during pregnancy is poor sleep quality. It's characterised as trouble getting to sleep or waking up too early, or problems occurring despite enough sleep opportunities and circumstances. Daytime impairments such as exhaustion, low energy, mood disturbances, and excessive anxiety or worry may be linked to poor sleep quality (Lee et al., 2020). When compared to the non-pregnant population, the frequency of poor sleep quality is higher during pregnancy, with up to 97 percent of pregnant women reporting disturbed sleep, especially in the third trimester. Because it is produced by sympathetic activity and a disruption of the hypothalamic-pituitary-adrenal (HPA) axis, high blood pressure during pregnancy can have serious consequences for pregnant women (Coelho, 2022).

Sleep deprivation has been related to a wide range of poor outcomes, including cognitive and functional impairment. Preterm labour, anxiety, caesarean birth, extended labour, intrauterine growth retardation, postpartum depression, and preeclampsia are all increased risks. As a result, managing poor sleep quality is critical for lowering blood pressure and improving maternal and foetal health (Chan et al., 2022).

In general, pharmacological and non-pharmacological treatments are utilized to treat anxiety and poor sleep quality. However, due to concerns about side effects, most pharmaceutical approaches are rarely utilized during pregnancy (Steegers et al., 2020). Relaxation techniques are a kind of complementary alternative therapy (CAT) that is well-known for its ability to reduce anxiety. It has demonstrated to have significant impacts on both the mother and the fetus

during pregnancy, since it aids the expectant mother in coping with worry and promoting long-term health in the antenatal period by slowing down the body and quieting the mind (Rhoades et al., 2018).

Also, the impact of relaxation techniques on hypertension has been studied in a number of previous studies. All relaxation treatments were found to be beneficial in lowering blood pressure, according to the findings. Dr. Herbert Benson identified a physiological response that is the polar opposite of fight or flight. It causes a reduction in metabolism, a decrease in heart rate, a lowering in blood pressure, a decrease in breathing rate, and slower brain waves. Relaxation therapy is a simple technique that a pregnant woman can learn to do for 10 to 20 minutes each day to help decrease blood pressure and stress (Dias et al., 2022).

Nurses can use non-pharmacological approaches to improve physiological indicators and sleep quality while also lowering anxiety levels in women with gestational hypertension. Based on research into the effectiveness of breathing exercises and relaxation therapy, the researcher believes there is a strong need to investigate the effect of Benson's relaxation therapy on lowering blood pressure, anxiety, and improving sleep quality in women with gestational hypertension.

### Significance of the study

According to Suhartono et al. (2022), gestational hypertension is responsible for around 18 percent of maternal deaths worldwide, or 62,000 to 77,000 deaths per year. While in Egypt, it complicates 4.2 percent of pregnancies. The majority of maternal deaths can be avoided since health-care strategies for preventing or managing complications are well-known (WHO, 2019). When Benson relaxation is used as part of a hospital's gestational hypertension program, less pharmacological medication is required, with the added benefit of fewer side effects (Tahmasbi & Hasani, 2016). Although the Benson relaxation technique has been shown to reduce stress, anxiety, worry, sleeplessness, and improve physiological parameters in obstetric and emergency cases, there is currently a shortage of evidence to support its usefulness in reducing anxiety and improving physiological parameters and sleep quality. As a result, the purpose of this study was fulfill to determine how Benson relaxation technique effected physiological parameters, anxiety, and sleep quality among women with gestational hypertension, in order to give strong research findings for adopting it as an evidence-based nursing technique for this women.

**Aim of Study:**

The aim of the current study was to; assess the effect of Benson relaxation technique on physiological parameters, anxiety and sleep quality among gestational hypertensive women.

The aim was fulfilled through the following:

- Assess the effect of Benson relaxation therapy on physiological parameters among women with gestational hypertension.
- Assess the effect of Benson relaxation therapy on anxiety levels among women with gestational hypertension.
- Assess the effect of Benson relaxation therapy on quality of sleep among women with gestational hypertension.

**Research hypothesis:**

- Women with gestational hypertension who receive Benson relaxation therapy exhibit normal physiological parameters than those who don't receive it.
- Women with gestational hypertension who receive Benson relaxation therapy exhibit less anxiety levels than those who don't receive it.
- Women with gestational hypertension who receive Benson relaxation therapy exhibit improved quality of sleep than those who don't receive it.

**Subjects and Method****Research design:**

This study used a quasi-experimental design to achieve the stated purpose.

**Study setting:**

The current study was conducted in all obstetrics hospitals (Obstetrics specialised hospital and Alhayaa hospital) in Port Said City that follow the comprehensive health insurance.

**Study sample:**

Purposive sample of 160 women with gestational hypertension who visited the previously indicated study setting and were randomly assigned to either the study group (n=80) or the control group (n=80), the study group received (Benson relaxation therapy) and the control group received (routine care). The following are the requirements for inclusion:

- Women in their next 20 weeks of pregnancy.
- Women have been diagnosed with gestational hypertension.
- Free from other medical problems.

**Sample size calculation:**

By using the following equation (Dobson, 1984), the sample size was determined:

$$Sample\ size\ (n) = \frac{Z^2}{\Delta^2} P (100 - P)$$

p : The prevalence of women with gestational hypertension = 5 (Magee & von Dadelszen, 2021).

$Z_{\alpha/2}$ : a percentile of standard normal distribution determined by 95% confidence level = 1.96

$\Delta$  : The width of the confidence interval = 5.

$$Sample\ size\ (n) = \frac{1.96^2}{5^2} 5 \times (100 - 5) = 73\ Women$$

A total of 73 women were included in the study. Because of the expected non-participation percentage (10 percent), the final sample size for each group was 80 females. The overall sample size was intended to be 160 women in order to detect a difference in physiological parameters, anxiety levels and sleep quality between two groups of pregnant women with gestational hypertension.

**Tools of data collection:****Three tools were used to collect the data:****Tool (I): Structured interviewing questionnaire:**

The researchers created this questionnaire after conducting a literature study. It is divided into three sections as follows:

**Part (I): The socio-demographic data:** It contained information on the woman's age, education, occupation, residency, family income, and crowding index.

**Part (II): obstetric history:** This contained information on the number of paras, gravida, abortions, stillbirths, mode of conception, type of previous delivery, and any past health issues that prevented pregnancy, as well as any previous health issues that occurred during pregnancy, labour, and postpartum.

**Part (III): History of present pregnancy:** This includes information on weeks of pregnancy, antenatal visits, and problems encountered during the current pregnancy.

**Tool (II): Physiological Parameters Sheet:** It was created by the researcher in order to evaluate vital signs.

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

This scale was adapted from (Pais-Ribeiro, et al., 2018) to assess women with gestational hypertension's anxiety levels. It's a fourteen-item scale with two subscales that can be used to detect clinically significant anxiety (HADS- A). It consists of seven anxiety-related questions labelled "A." For each item, women's are asked to select one response from four options. The total score of twenty one is separated into four ranges, ranging from zero to three.

- Normal range from (0 to 7)
- Mild range from (8 to 10)
- Moderate range from (11 to 15)
- Severe range from (16 to 21)

**Tool IV: The Groningen Sleep Quality Scale (GSQS):**

This scale was adapted from Meesters et al. (1993), and it was used to determine the respondents' overall sleep quality patterns. It consists of 15 questions that examine a person's sleeping habits. This scale's scoring system is as shown in: the first question does not contribute to the overall score. If the answer is "True," one point is awarded for questions 2, 3, 4, 5, 6, 7, 9, 11, 13, 14, 15. If you respond "False" to questions 8, 10, and 12, you will receive one point. The measure has a range of scores from 0 to 14, with a higher score indicating a lower subjective sleep quality. Normal refreshing sleep is represented by a total score of (0-2). The range of (3-9) was deemed slightly disturbed sleep in this study, whereas the range of (10-14) was considered poor sleep quality.

**Tools validity:** Nine experts in the domains of obstetrics and gynaecological nursing and psychiatric health nursing checked the instruments for content validity. After making the indicated adjustments, the completed form was ready to use.

**Reliability:** An Alpha Cronbach reliability analysis was performed on the study instrument. The Cronbach's Alpha coefficient test revealed acceptable internal consistency of instruments, with  $r = 0.75$  for the Beck anxiety inventory and  $r = 0.88$  for the Groningen sleep quality scale.

**Ethical consideration:** The study was authorised by the Research Ethics Committee of Port Said University's Faculty of Nursing. All women in the study sample were informed that participation in the study is optional. The researcher stated the study's goal to all women in the study sample. They were told that all research data would be kept secret and would only be used for the study's purposes. The subjects' privacy was always protected. Before being enrolled, the women signed informed written consents.

**Administrative design:** After the faculty of nursing sent an official letter to the relevant authorities of the preceding mentioned setting to get their authorization for data collection, an official permission was granted.

**Pilot study:** A pilot study of 10% of the sample (16 woman) were undertaken to determine the questionnaire's validity and reliability, after which it was modified and tested for research feasibility, clarity, and objectivity, as well as to estimate the time required for data collection. The pilot study not included in the total sample.

**Fieldwork:****Procedures**

The women were introduced to the researchers, and the study's purpose was described to them. Before collecting data, they gave their informed written

consent. The fieldwork took eight months to complete. The study was carried out in four stages: assessment, implementation, follow-up, and evaluation of the results. From the beginning of January 2021 until the end of August 2021, these were carried out. The researchers visited the in-patient unit in the previously indicated setting three times a week (Saturday, Monday, and Wednesday) from 7 a.m. to 2 p.m. Benson relaxation therapy was given to the study group.

**Preparation for the intervention**

The preparatory phase's purpose was to have the data collection instruments in order. The researcher reviewed local and international literature, different studies, and theoretical knowledge in many aspects of the research issue using books, papers, the internet, periodicals, and magazines to gain a deeper understanding of the study subject. This contributed in the development of the research instruments as well. The researchers got an acceptance letter from the study setting in order to conduct the current study, and they also met with women to discuss the study's goals in order to gain cooperation.

To assure the success of the Benson relaxation therapy, the researcher received proper instruction and training on how to apply the Benson relaxation technique from a professional in mental relaxation therapy.

**Implementation of the intervention**

Using a standardized interviewing questionnaire, each woman in the control and study groups was interviewed face to face individually for 45 minutes to collect basic data of the first, second, third & fourth tools. Each woman was randomly assigned to one of two groups: the control group, which consisted of 80 women, was given standard nursing care in accordance with hospital policy. Also, 80 women were included in the study group, and they were given relaxation techniques by Benson.

The following steps were used to implement Benson relaxation therapy for the study group on two sessions, one hour for each session. The first session include: content preparation which included a presentation (demonstration) about Benson relaxation technique (definition, purpose, types of relaxation therapy, and how it was used), environment preparation which included the women sitting calmly in a comfortable position in a quiet place, and implementation in which the researcher used the Benson relaxation technique twice a day, three hours apart, for women with gestational hypertension.

The second session, the researcher conducted one-on-one interviews with each woman in the study group to demonstrate the Benson relaxation technique while the women watched. The woman was then asked to apply it again. The steps was performed as follows:

step one the woman was asked to choose a focus word (for example, "one"), step two the woman was advised to close her eyes, step three the woman was instructed to relax all of her muscles progressively, starting with her toes and feet and moving up to her entire body, step four the woman was instructed to take naturally and slowly breaths to inhale from three to five seconds, pause from three to five seconds, repeat the targeted words or phrases or focus on breathing rhythm silently as she exhales from three to five second. Continue the previous steps for 10-20 minutes.

#### Follow up and evaluation

Using the second, third, and fourth tools, the researcher continuously followed up and evaluated

Benson relaxation techniques and women outcome for both the control and study groups following intervention.

#### Data Analysis:

Statistical Package for Social Science for Windows version 20.0 was used for all statistical analyses (SPSS, Chicago, IL). Continuous data had a normal distribution and were reported as mean standard deviation (SD). Numbers and percentages are used to express categorical data. For numerical variables, the comparisons were made using the Student's t-test, and for qualitative variables, the Chi-square test was utilized. The level for statistical significance was established at  $p \leq 0.05$ .

## Results

**Table (1): Distribution of the control and the study groups of women according to their general characteristics.**

| Personal characteristics          | Study group (n=80) |      | Control group (n=80) |      | Significance                     |
|-----------------------------------|--------------------|------|----------------------|------|----------------------------------|
|                                   | No.                | %    | No.                  | %    |                                  |
| <b>Age (years)</b>                |                    |      |                      |      | t=2.167<br>P=0.037*              |
| Less than 20                      | 4                  | 5.0  | 8                    | 10.0 |                                  |
| 20-                               | 56                 | 70.0 | 24                   | 30.0 |                                  |
| 30-<40                            | 20                 | 25.0 | 48                   | 60.0 |                                  |
| Range                             | 17-38              |      | 19-38                |      |                                  |
| Mean±SD                           | 26.2±5.9           |      | 30.6±6.9             |      |                                  |
| <b>Educational level</b>          |                    |      |                      |      | <sup>MC</sup> P=0.784            |
| Read and write                    | 4                  | 5.0  | 4                    | 5.0  |                                  |
| Primary                           | 8                  | 10.0 | 16                   | 20.0 |                                  |
| Preparatory                       | 12                 | 15.0 | 8                    | 10.0 |                                  |
| Diploma                           | 40                 | 50.0 | 40                   | 50.0 |                                  |
| University                        | 16                 | 20.0 | 12                   | 15.0 |                                  |
| <b>Employment</b>                 |                    |      |                      |      | X <sup>2</sup> =0.175<br>P=0.676 |
| House wife                        | 44                 | 55.0 | 48                   | 60.0 |                                  |
| Employed                          | 36                 | 45.0 | 32                   | 40.0 |                                  |
| <b>Family monthly income (LE)</b> |                    |      |                      |      | t=0.64<br>P=0.526                |
| Less than 1000                    | 8                  | 10.0 | 8                    | 10.0 |                                  |
| 1000-                             | 40                 | 50.0 | 32                   | 40.0 |                                  |
| 2000-<3000                        | 32                 | 40.0 | 40                   | 50.0 |                                  |
| Range                             | 500-2500           |      | 750-2500             |      |                                  |
| Mean±SD                           | 1647.8±537.6       |      | 1755.9±513.5         |      |                                  |
| <b>Crowding index</b>             |                    |      |                      |      | Z=0.0<br>P=1.0                   |
| Range                             | 1.0-2.0            |      | 0.7-2.0              |      |                                  |
| Mean±SD                           | 1.3±0.4            |      | 1.3±0.4              |      |                                  |

All are live in urban areas.

<sup>MC</sup>P: Monte Carlo test

t: t-test

X<sup>2</sup>: Chi-Square test

Z: Mann Whitney test

\*significant at  $P \leq 0.05$

Table (2): Distribution of the control and the study groups of women according to their obstetric history.

| Obstetric history                             | Study group (n=80) |      | Control group (n=80) |      | Test    | P value |
|---|--------------------|------|----------------------|------|---------|---------|
|   | No                 | %    | No                   | %    |         |         |
| <b>Gravida:</b>                               |                    |      |                      |      |         |         |
| 1   | 40                 | 50.0 | 40                   | 50.0 | Z=1.213 | 0.225   |
| 2-3   | 40                 | 50.0 | 24                   | 30.0 |         |         |
| 4   | 0                  | 0.0  | 16                   | 20.0 |         |         |
| Range   | 1-3                |      | 1-4                  |      |         |         |
| Mean±SD                                       | 1.6±0.7            |      | 2.2±1.3              |      |         |         |
| <b>Para:</b>                                  |                    |      |                      |      |         |         |
| Prime   | 40                 | 50.0 | 40                   | 50.0 | Z=1.169 | 0.242   |
| 1-2   | 40                 | 50.0 | 24                   | 30.0 |         |         |
| 3   | 0                  | 0.0  | 16                   | 20.0 |         |         |
| Mean±SD                                       | 0.6±0.7            |      | 1.1±1.2              |      |         |         |
| <b>Number of abortions</b>                    |                    |      |                      |      |         |         |
| Yes   | 10                 | 12.5 | 6                    | 7.5  | Z=1.410 | 0.456   |
| No  | 70                 | 87.5 | 74                   | 92.5 |         |         |
| <b>Duration of current pregnancy (weeks):</b> | 36.5±1.3           |      | 32.9±3.6             |      | t=3.94  | 0.001*  |
| Mean±SD                                       |                    |      |                      |      |         |         |

t: t-test

Z: Mann Whitney test

\*significant at P≤0.05

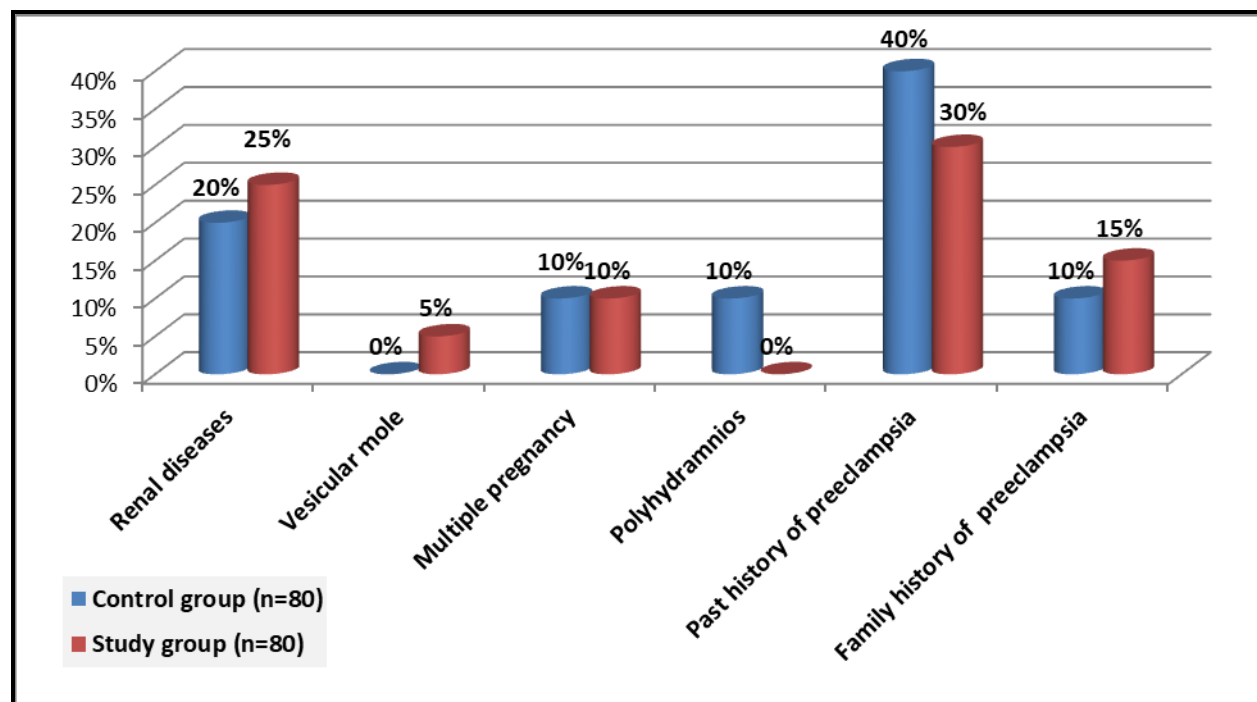


Figure (1): Distribution of the control and the study groups of women according to their risk factors for hypertension during pregnancy

**Table (3): Distribution of the control and the study groups of women according to their vital signs before and after the intervention.**

| Ante-natal clinical profile<br>(Vital signs) | Study group<br>(n = 80) |      |       |      | Control group<br>(n = 80) |      |       |      | χ <sup>2</sup> (p1)              | χ <sup>2</sup> (p2)  |
|--|-------------------------|------|-------|------|---------------------------|------|-------|------|----------------------------------|----------------------|
|  | Before                  |      | After |      | Before                    |      | After |      |                                  |                      |
|  | No.                     | %    | No.   | %    | No.                       | %    | No.   | %    |                                  |                      |
| <b>Temperature (°C)</b>                      |                         |      |       |      |                           |      |       |      |                                  |                      |
| 36.5-37                                      | 56                      | 70.0 | 12    | 15.0 | 60                        | 75.0 | 44    | 55.0 | 0.251<br>(0.617)                 | 14.066*<br>(<0.001*) |
| 37.1-37.4                                    | 24                      | 30.0 | 68    | 85.0 | 20                        | 25.0 | 36    | 45.0 |                                  |                      |
| <b>McN<sub>p0</sub></b>                      | <0.001*                 |      |       |      | 0.077                     |      |       |      |                                  |                      |
| <b>Blood pressure (MMHG)</b>                 |                         |      |       |      |                           |      |       |      |                                  |                      |
| >140/90-150/100                              | 6                       | 7.5  | 58    | 72.5 | 2                         | 2.5  | 8     | 10.0 | 1.154<br>( <sup>MC</sup> p=0.61) | 35.768*<br>(<0.001*) |
| >160/110-180/150                             | 50                      | 62.5 | 22    | 27.5 | 50                        | 62.5 | 48    | 60.0 |                                  |                      |
| >190/160-250/180                             | 24                      | 30.0 | 0     | 0.0  | 28                        | 35.0 | 24    | 30.0 |                                  |                      |
| <b>MH<sub>p0</sub></b>                       | <0.001*                 |      |       |      | 0.096                     |      |       |      |                                  |                      |
| <b>Pulse (Beat/minute)</b>                   |                         |      |       |      |                           |      |       |      |                                  |                      |
| 85-90  | 6                       | 7.5  | 58    | 72.5 | 4                         | 5.0  | 8     | 10.0 | 0.469<br>( <sup>MC</sup> p=0.87) | 35.384*<br>(<0.001*) |
| 95-110                                       | 52                      | 65.0 | 22    | 27.5 | 50                        | 62.5 | 50    | 62.5 |                                  |                      |
| <115   | 22                      | 27.5 | 0     | 0.0  | 26                        | 32.5 | 22    | 27.5 |                                  |                      |
| <b>MH<sub>p0</sub></b>                       | <0.001*                 |      |       |      | 0.102                     |      |       |      |                                  |                      |
| <b>Respiration (Cycle/minute)</b>            |                         |      |       |      |                           |      |       |      |                                  |                      |
| 16-22  | 20                      | 25.0 | 62    | 77.5 | 6                         | 7.5  | 8     | 10.0 | 5.513<br>(0.064)                 | 39.086*<br>(<0.001*) |
| 23-25  | 50                      | 62.5 | 18    | 22.5 | 54                        | 67.5 | 52    | 65.0 |                                  |                      |
| <26  | 10                      | 12.5 | 0     | 0.0  | 20                        | 25.0 | 20    | 25.0 |                                  |                      |
| <b>MH<sub>p0</sub></b>                       | <0.001*                 |      |       |      | 0.317                     |      |       |      |                                  |                      |

χ<sup>2</sup>: Chi square test

MC: Monte Carlo

McN: McNemar test

MH: Marginal Homogeneity Test

\*significant at P≤0.05

**Table (4): Distribution of the control and the study groups of women according to their level of anxiety before and after the intervention.**

| Hospital Anxiety Scale (HAS)        | Study group (N=80)  |      |                    |       | Control group (N=80) |       |                    |       | FET/χ <sup>2</sup> (P) |                      |
|-------------------------------------|---------------------|------|--------------------|-------|----------------------|-------|--------------------|-------|------------------------|----------------------|
|                                     | Before intervention |      | After intervention |       | Before intervention  |       | After intervention |       | Before                 | After                |
|                                     | No                  | %    | No                 | %     | No                   | %     | No                 | %     |                        |                      |
| <b>Normal (zero-seven)</b>          | 52                  | 65%  | 69                 | 86.2% | 42                   | 52.2% | 46                 | 57.6% | 13.562*<br>(0.003*)    | 21.124*<br>(<0.001*) |
| <b>Mild (eight- ten)</b>            | 24                  | 30%  | 11                 | 13.8% | 18                   | 22.8% | 22                 | 27.6% |                        |                      |
| <b>Moderate eleven-fifteen</b>      | 4                   | 5.0% | 0                  | 0.0%  | 14                   | 17.5% | 10                 | 12.3% |                        |                      |
| <b>Severe ( sixteen-twenty one)</b> | 0                   | 0.0% | 0                  | 0.0%  | 6                    | 7.5%  | 2                  | 2.5%  |                        |                      |
| <b>FET/χ<sup>2</sup> (P)</b>        | 34.872* (<0.001*)   |      |                    |       | 19.144* (0.001*)     |       |                    |       |                        |                      |

χ<sup>2</sup> (P): Chi-Square Test & P for χ<sup>2</sup>Test FET (P): Fisher Exact Test & P for FET-Test \*: Significant at P ≤0.01

**Table (5): Distribution of the control and the study groups of women according to their total Quality of Sleep score before and after the intervention.**

| Total Score of Quality of Sleep    | Study group (N=80)  |        |                    |       | Control group (N=80) |     |                    |        | T FET/ $\chi^2$ (P) |                        |
|------------------------------------|---------------------|--------|--------------------|-------|----------------------|-----|--------------------|--------|---------------------|------------------------|
|                                    | Before intervention |        | After intervention |       | Before intervention  |     | After intervention |        | Before              | After                  |
|                                    | No                  | %      | No                 | %     | No                   | %   | No                 | %      |                     |                        |
| • Good quality of sleep (0-5)      | 1                   | 1.25%  | 71                 | 88.8% | 0                    | 0%  | 3                  | 3.75%  | 0.346<br>(0.841)    | 39.936<br>(0.000)<br>* |
| • Fair quality of sleep (6-8)      | 9                   | 11.25% | 8                  | 10%   | 16                   | 20% | 20                 | 25%    |                     |                        |
| • Poor quality of sleep (9-14)     | 70                  | 87.5%  | 1                  | 1.2%  | 64                   | 80% | 57                 | 71.25% |                     |                        |
| <b>FET/<math>\chi^2</math> (P)</b> | 49.829 (0.000) *    |        |                    |       | 6.581 (0.167)        |     |                    |        |                     |                        |

$\chi^2$  (P): Chi-Square Test & P for  $\chi^2$  Test FET (P): Fisher Exact Test & P for FET-Test \*: Significant at  $P \leq 0.01$

**Table (6): Effectiveness of Benson's Relaxation Technique on vital signs among the studied groups.**

| Groups                         | Systolic blood pressure | Diastolic blood pressure | Pulse             | Respiration       |
|--------------------------------|-------------------------|--------------------------|-------------------|-------------------|
| <b>Study group</b>             |                         |                          |                   |                   |
| <b>Mean <math>\pm</math>SD</b> | 139.8 $\pm$ 4.3         | 85.75 $\pm$ 7.9          | 86.40 $\pm$ 6.088 | 20.67 $\pm$ 1.207 |
| <b>T test (P)</b>              | 0.298 (0.001*)          | 0.172 (0.001*)           | 1.971 (0.001*)    | 2.704 (0.001*)    |
| <b>Control group</b>           |                         |                          |                   |                   |
| <b>Mean <math>\pm</math>SD</b> | 145.7 $\pm$ 5.04        | 87.38 $\pm$ 8.4          | 93.05 $\pm$ 10.99 | 22.83 $\pm$ 2.899 |
| <b>T test (P)</b>              | 0.635 (0.096)           | 2.085 (0.076)            | 2.05 (0.102)      | 4.42 (0.317)      |

\*Significant at  $p < 0.001$

**Table (7): Effectiveness of Benson's Relaxation Technique on reduction of level of anxiety among studied groups (N=80).**

| Groups               | Mean $\pm$ SD      | T test (P)       |
|----------------------|--------------------|------------------|
| <b>Study Group</b>   | 8.475 $\pm$ 4.353  | 17.844 (0.000) * |
| <b>Control group</b> | 36.500 $\pm$ 7.865 |                  |

\*Significant at  $p < 0.05$

**Table (8): Effectiveness of Benson's Relaxation Technique on quality of sleep among studied groups.**

| Groups               | Mean $\pm$ SD   | T test (P)          |
|----------------------|-----------------|---------------------|
| <b>Study Group</b>   | 4.53 $\pm$ 0.46 | t=3.746* (p<0.001*) |
| <b>Control group</b> | 8.32 $\pm$ 0.38 |                     |

\*Significant at  $p < 0.001$

**Table (1):** Distribution of the control and the study groups of women according to their general characteristics are shown in. Concerning age, the control group had the biggest percentage (60.0%) of study individuals ranging from 30 to more than 40 years old. While nearly four-fifths of the participants in the study were under the age of 30. However, there was a statistically significant difference ( $P = 0.037$ ) between the two groups.

Regarding educational attainment, nearly half of the women in both groups had earned a diploma. And more than half of the mothers in the study were housewives, with a family income of 2000 EP or more in the control group, compared to 50.0 % in the

study group with less than 2000EP. In terms of the number of family members, the control group had the highest percentage of study mothers (60.0 percent) with less than four, compared to 90 percent of the study group. There were no statistically significant differences between the two groups in terms level of education, job status, monthly family income, or the number of family members.

As regard of crowding index. Mean $\pm$ SD in the study group was 1.3 $\pm$ 0.4 compared to 1.3 $\pm$ 0.4 in the control group. In terms of general characteristics, there was no statistically significant difference between the two groups.



**Table (2):** Shows the distribution of women in the control and the study groups based on their obstetric history. Number of pregnancies in both the control and research groups were similar, with around half of the mothers being primigravida. The number of deliveries was associated with nullipara in 50% of the women. As a result, there was no statistically significant difference in the number of pregnancies and deliveries between the two groups.

In terms of abortion, 87.5 percent of the study group compared to 92.5 percent of the control group, had never had an abortion. And, the duration of the current pregnancy, the control group's mean score was  $32.9 \pm 3.6$ , compared to  $36.5 \pm 1.3$  for the study group. However, there were statistically significant differences in the mean score of current pregnancy duration between the two groups.

**Figure (1):** Displayed the distribution of women in the control and the study groups based on their hypertension risk factors during pregnancy. In terms of preeclampsia, 40.0 percent of women in the control group and 30.0 percent of women in the study group, had a history of preeclampsia. In addition, 20% and 25% of the control and study groups respectively, had a history of renal illness.

**Table (3):** Shows the distribution of women in the control and the study groups regarding vital signs before and after the intervention. It describes that 85 percent of the study subjects had  $37.1$  to  $37.4$  ° C in relation to temperature immediately after intervention, compared to only 45 percent of the control group. In regards blood pressure, 72.5 percent of the study subjects had 140/90 to 150/100 blood pressure immediately after intervention, compared to only 10% of the control group.

Concerning pulse immediately after intervention was 72.5 percent of the study participants had 85 to 90 beats per minute, compared to only 10% of the control group. Also, 77.5 percent of the study subjects had 16 to 22 c/m respiration immediately after intervention, compared to only 10% of the control group. Also, the difference between the study group and the control group after the intervention was statistically significant ( $p=0.001$ ), although the difference between the control group and the study group before the intervention was not significant. Moreover, before and after the intervention, there was a statistically significant difference in the study group ( $P=0.001$ ). In contrast, in control group there was not statistically significant.

**Table (4):** Shows the distribution of women in the control and the study groups based on their anxiety levels before and after the intervention. Before the intervention, the highest percentage of the study and control groups (65 percent and 52.2 percent, respectively) experienced normal anxiety level, with a

statistically significant difference between them ( $P=0.003^*$ ). After the intervention, Benson relaxation techniques resulted in significant major improvement between the study group (86.2%) and the control group (57.6%), with a statistically significant difference between them ( $P=0.001^*$ ). Also, before and after the intervention, there was a statistically significant difference in the study and control group ( $P=0.001$ ).

**Table (5):** Shows the distribution of women in the control and the study groups based on their total quality of sleep score before and after the intervention. Before the intervention, the highest percentage of the study and control groups (87.5 percent and 80 percent, respectively) had poor quality of life, with no statistically significant difference between them ( $P=0.346$ ). After the intervention, around 88.8 percent of the study group experienced good quality of sleep compared to 3.75 percent of the control group. And 1.25 percent of study group had poor quality of sleep compared to 71.25 percent of control group, the association between both groups was statistically highly significant where  $P=0.000$ . Moreover, before and after the intervention, there was a statistically significant difference in the study group's sleep quality score system ( $P=0.000$ ). In contrast, the control group there was not statistically significant ( $P=0.167$ ).

**table (6):** Effectiveness of Benson's Relaxation Technique on vital signs among the studied groups are presented in. It's evident that mean standard deviation score in the study group regards systolic blood pressure, diastolic blood pressure, pulse and respiration was lower than the mean standard deviation score in the control group. There was statistically significant difference in study group ( $P=0.001$ ) compared to no statistically significant difference in control group.

**Table (7):** Shows the effectiveness of Benson's relaxation technique on reduction of level of anxiety among studied groups. It revealed that mean standard deviation score in the study group was  $8.475 \pm 4.353$ , while the mean score in the control group was  $36.500 \pm 7.865$ . The t value was 17.844, which is significant at the  $P=0.000$  level, indicating that Benson's relaxation technique was helpful in reducing anxiety levels in the study group.

**Table (8):** Indicates effectiveness of Benson's relaxation technique on quality of sleep among studied groups. It evident that mean standard deviation scores in the study and control groups were  $4.53 \pm 0.46$  and  $8.32 \pm 0.38$ , respectively. Also, the data shows that the t value was  $3.746^*$ , which is significant at the  $p<0.001$  level, indicating that Benson's relaxation therapy was helpful in enhancing sleep quality in the study group.

## Discussion

High blood pressure during pregnancy can be harmful to both the mother and the baby, and is linked to an increased risk of preeclampsia as well as psychological issues such as anxiety and poor sleep quality. Benson Relaxation techniques can lower the sympathetic nervous system's activity, allowing the arteries to open and increase oxygen and blood flow to the body's tissues. It can also aid in the reduction of blood pressure, the reduction of anxiety, and the improvement of sleep quality (Babu et al., 2019). So, the present study was conducted to assess the effect of Benson relaxation techniques on physiological parameters, anxiety level and the sleep quality among gestational hypertensive women.

The current study's findings demonstrated that there was no statistically significant change in physiological parameters between the two groups before intervention (temperature, pulse, respiration and blood pressure). However, there was a large statistically significant difference between the two groups following intervention, with the study group performing much better than the control group. In the same line according to Lindquist et al., (2018) literature, Benson relaxation is a non-pharmacological method of counteracting the detrimental effects of gestational hypertension by inhibiting sympathetic nerves and stimulating parasympathetic nerves by limiting the mind's feedback pathway, hence preventing the biological response. As a result, the relaxation response (RR) lowers blood pressure, heart rate, and metabolic rate. Also, according to Abd Elgwad et al., (2021) who reported that, Benson relaxation can be applied to enhance physiological parameters and reduce stress levels in pre-eclamptic women. Furthermore, due to decreased inflammation and blood vessel constriction, blood pressure is controlled throughout the relaxation technique, and blood vessels widen. This is due to nitric oxide, a chemical produced by the body that helps relax and widen blood vessels, hence lowering blood pressure (Darkwa et al., 2018) In this study, there was a statistically significant effect of Benson's relaxation technique when applied among women with gestational hypertension on reducing the level of anxiety in the study group at p value (0.001\*), and there was a remarkable improvement in the level of anxiety, which could be due to the improvements that Benson relaxation techniques induce on physiological parameters. This may give the study participants a sense of control over their bodies and, as a result, their minds, resulting in less anxiety and a greater sense of comfort. In the same line, Ibrahim et al. (2019) found that patients who received Benson relaxation techniques show a greater reduction in anxiety level

than those who did not.

In addition, Mohammadi & Parandin (2019) conducted research in Iran and they discovered that combining the Benson relaxation technique (BRT) with a brief psycho-educational intervention (BPI) can help pregnant women reduce negative psychological symptoms and multidimensional pain. It is suggested that this intervention be explored as part of a healthcare programme for pregnant women. Also, Tahmasbi & Hasani (2016) found that using the Benson relaxation technique reduced anxiety in the intervention group considerably.

Furthermore, Salmanzadeh et al., (2018) found that Benson relaxation reduced anxiety prior to delivery in nulliparous women. This could be explained by studies showing that muscle relaxation reduces oxygen consumption, increases CO<sub>2</sub> disposal, and lowers heartbeat and blood pressure, which reduces anxiety and mental stress in pregnant women. Such similarity in the results of the above studies can be attributed to what is elicited in the literature about the effect of relaxation on anxiety reduction via the release of natural opiates called endorphins by the body. Endorphins can be released by a variety of stimuli, including laughter and feeling good (Hoffmann & Smits, 2017).

Concerning the influence of the Benson relaxation technique on sleeping quality, the current findings revealed that it was very significant and successful in improving sleeping quality in the study group compared to the control group. And the current study found that following the intervention, almost great majority of the study group had good sleep quality, compared to very small percentage of the control group, with a statistically significant difference (P=0.000). This study indicates that the Benson relaxation technique may have a beneficial influence on the sleeping quality of women with gestational hypertension. This finding could be explained by the fact that the Benson relaxation technique relaxes the body, keeps blood pressure in a normal range, improves circulation, and improves muscular relaxation. These findings confirmed with those Phansikar & Mullen (2022), who discovered that these exercises aid in the shift to the parasympathetic nervous system, ensuring bodily and mental calm.

This conclusion is also consistent with Habibollahpour et al., (2019) findings, which demonstrated significant improvements in the study group's sleep quality after using Benson's relaxation technique on a women. Also, this is in congruent with Bryan & Bride (2017) more recently found that Benson relaxation techniques improves mental and physical function, combats fatigue, reduces anxiety, and improves sleep. Moreover, Benson relaxation techniques, according to Umam et al., (2020), are a

new and easy way to reduce sleep disturbance in pregnancy.

### Conclusion

Based on the findings of this study, it is possible to conclude that Benson relaxation can be used as an effective intervention to enhance physiological parameters, sleep quality, and reduce anxiety levels for women with gestational hypertension. The Benson relaxation technique is simple, has no recorded negative effects, and is widely accepted, thus it should be available to women with gestational hypertension whenever possible.

### Recommendations

The following suggestions can be made based on the findings of the current study:

- The Benson relaxation technique is a low-cost, high-effective, and simple-to-use therapy for women with gestational hypertension. As a result, the nursing team should include such techniques in the nursing care plan for this group of pregnant women.
- The Benson relaxation technique for women with gestational hypertension should be included in the basic nursing education curriculum as well as continuing education.
- Periodic in-service training programs for nurses, such as workshops and conferences, should be conducted to ensure that they are aware of Benson relaxation technique, its benefits, and how to use it.

### Future research:

- a. Apply the study with a larger sample size and a broader geographic area to allow for more generality of the findings.
- b. Examining the impact of the Benson relaxation technique on postnatal stress, exhaustion, and quality of life.

### 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.
- **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.
- **Bryan V & Bride J. (2017):** Health care community synergism between patient practionars and researchers. USA: medical information science, 188-190.
- **Chan, C., Poon, S., Chua, T., Razali, N., Tan, K. H., & Chen, H. (2022):** A Prospective Study of the Relationship Between Sleep Quality and Depression in Pregnancy. *Proceedings of Singapore Healthcare*, 20101058211068591.
- **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.
- **Coelho, G. (2022):** Sleep and Gender Differences. In *Sleep Medicine and Physical Therapy* (pp. 275-283). Springer, Cham.
- **Darkwa, E, Djagbletey, R., Essuman, R., Sottie, D., Dankwah, G., & Aryee, G., (2018):** Nitric Oxide and Pre- Eclampsia: A Comparative Study in Ghana. *Open access Macedonian Journal of Medical Sciences*, 6(6), 1023-1027. doi: 10.3889/oamjms.2018.252.
- **Dias, P., Pourová, J., Vopršalová, M., Nejmanová, I., & Mladěnka, P. (2022):** 3-Hydroxyphenylacetic Acid: A Blood Pressure-Reducing Flavonoid Metabolite. *Nutrients*, 14(2), 328.
- **Dobson, G. (1984):** Scheduling independent tasks on uniform processors. *SIAM Journal on Computing*, 13(4), 705-716.
- **Fox, R., Kitt, J., Leeson, P., Aye, C., & Lewandowski, A. (2019):** Preeclampsia: Risk Factors, Diagnosis, Management, and the Cardiovascular Impact on the Offspring. *J Clin Med*, 8(10). doi: 10.3390/jcm8101625.
- **Green S., Frey B., Donegan E. & McCabe R. (2019):** Cognitive behavioral therapy for anxiety and beyond: how to manage symptoms and maximize wellbeing. *New York. Congress*, 33-7.
- **Habibollahpour, M., Ranjkesh, F., Motalebi, S. A., & Mohammadi, F. (2019):** The Impact of Benson's Relaxation Technique on the Quality of Sleep in the Elderly. *Topics in Geriatric Rehabilitation*, 35(1), 88-94.
- **Hoffmann S, & Smits J. (2017):** Cognitive Behavioral Therapy for Anxiety and Depression .USA: Elsevier, 625-34.
- **Ibrahim, A., Koyuncu, G., Koyuncu, N., Suzer, N., Cakir, O., & Karcioğlu, O. (2019):** The effect of Benson relaxation method on anxiety in the emergency care. *Medicine*, 98(21).
- **Lee, P., Liu, L., Ho, C., Ang, A., Huang, H., Teoh, O., & Cai, S. (2020):** Antenatal sleep quality associated with perinatal outcomes in women of advanced maternal age. *Sleep health*, 6(1), 60-64.
- **Lindquist, R., Tracy, M., & Snyder, M. (Eds.). (2018):** Complementary and alternative therapies in nursing. Springer Publishing Company.

- **Lowdermilk D., Perry S., Cashion K. & Alden K. (2016):** Maternity women and health care. 11th ed. China: Elsevier, 382-88.
- **Magee LA, & von Dadelszen P. (2021):** Management of Hypertension in Pregnancy. *Maternal Fetal Med*; 3(2):124–135. doi: 10.1097/FM9.000000000000095.
- **Mauren, G., & LP, P. (2022):** Perinatal Mood & Anxiety Disorders: What ALL Clinicians Need To Know.
- **McCoyd, J., Curran, L., & Munch, S. (2020):** They say, “If you don’t relax... you’re going to make something bad happen”: women’s emotion management during medically high-risk pregnancy. *Psychology of Women Quarterly*, 44(1), 117-129.
- **Meesters, Y., Jansen, J., Lambers, P., Bouhuys, A., Beersma, D., & Van den Hoofdakker, R. (1993):** Morning and evening light treatment of seasonal affective disorder: response, relapse and prediction. *Journal of affective disorders*, 28(3), 165-177.
- **Mohammadi, 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.
- **Moore, T., Arefadib, N., Deery, A., West, S., & Keyes, M. (2017):** The first thousand days: an evidence paper-summary.
- **Pais-Ribeiro, J., da Silva, A., Vilhena, E., Moreira, I., Santos, E., & Mendonça, D. (2018):** The hospital anxiety and depression scale, in patients with multiple sclerosis. *Neuropsychiatric disease and treatment*, 14, 3193.
- **Phansikar, M., & Mullen, S. (2022):** Cognitive and psychosocial effects of an acute sun salutation intervention among adults with stress. *Mental Health and Physical Activity*, 22, 100431.
- **Rhoades, R. (2018):** Aging Well: Staying Younger, Smarter, and Fit. First Edition Design Pub..
- **Salmanzadeh A., Ragoi A., Rahgozar M., Shahbelaghi F. & Khoshknab M. (2018):** The Effect of Benson's relaxation on pre-operative anxiety in Cesarean section in Nulliparus Women. *Journal of Advanced Pharmacy Education & Research*, 8(2):194-200.
- **Stegers, E., Cipolla, M., & Miller, E. (Eds.). (2020):** Neurology and Pregnancy: Neuro-obstetric Disorders. Elsevier.
- **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.
- **Tahmasbi, H., & Hasani, S. (2016):** Effect of Benson’s relaxation technique on the anxiety of patients undergoing coronary angiography: A randomized control trial. *Journal of Nursing and Midwifery Sciences*, 3(1), 8-14.
- **Umam, E., Sulistyono, A., & Yunitasari, E. (2020):** The Effect of a Combination of Autogenic and Benson Relaxation on Sleep Quality among Pregnant Women with Hypertension. *International Journal of Nursing and Health Services (IJNHS)*, 3(4), 501-506.
- **WHO. (2019):** Maternal mortality. Available at URL: <http://who/newsroom/factsheets/detail/maternal-mortality>. Retrieved on June 2020.