Effect of Benson`s Relaxation Therapy on Physiological Parameters, Sleep Quality and Anxiety Level among Antenatal Mothers with High Risk Pregnancy

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Abstract

Background: High-risk pregnancy refers to a situation in which the pregnancy is complicated by various factors. These factors can lead to increased psychological stress for the pregnant woman as well as experiencing depression and anxiety. Among the various relaxation methods, Benson's relaxation used for reducing anxiety by influencing both mental and physical conditions, It is considered to be one of the simplest to administer and learn. **Aim**: To evaluate the impact of Benson's relaxation therapy on anxiety levels in antenatal mothers with high-risk pregnancies. **Design**: The present study employed a quasi-experimental research design. **Setting**: The study was performed at the obstetric and gynecologic department in Damanhour National Medical Institute. **Subjects:** A sample of 80 pregnant women with high-risk pregnancies was conveniently selected**. Tools**: Data collection utilized four tools. **Tool one:** Structured interview schedule for socio-demographic and reproductive history**. Tool Two:** The Groningen Sleep Quality Scale (GSQS). **Tool Three:** Perinatal Anxiety Screening Scale (PASS) **Results**: The finding of this study reveals a highly statistically significant distinction among the studied groups concerning the maintenance of physiological parameters (respiratory rate, blood pressure, and pulse rate) inside normal ranges ($P \leq 0.05$).. Furthermore, the study group demonstrated a significant enhancement in sleep quality, with the percentage of subjects experiencing good quality of sleep increasing from 12.5% to 80% post-intervention, while the control group maintained a high mean quality of sleep even after the fifth day of intervention. Additionally, all participants in the study group no longer had severe anxiety symptoms, in contrast to 77.5% of the control group. Moreover, there was a notable rise in the percentage of study group participants with asymptomatic anxiety, rising from 15% before the intervention to 75% after. This difference was highly statistically significant among both groups ($p \leq 0.05$). **Conclusion:** The outcomes of this study performed that Benson relaxation therapy (BRT) positively an impact on stress reduction and enhance sleep quality in high-risk pregnant women. Furthermore, BRT has shown significant effectiveness in regulating physiological indicators, like respiratory rate, blood pressure, and pulse rate to optimal levels. **Recommendations:** Benson relaxation method is an affordable, highly efficient, and user-friendly therapy for women experiencing high-risk pregnancies. Therefore, it is recommended that the nursing team incorporate these techniques into the care plan for this particular group of expectant mothers.

Keywords: Anxiety, Benson's Relaxation Therapy, High risk pregnancy

Introduction

Being pregnant is a delightful phase in a woman's existence, filled with daily excitement and eagerness to cradle her newborn at the end of the ninth month. However, not all pregnancies progress smoothly. Occasionally, they can be complicated by health issues or other medical conditions classified as "high risk". (**El-Sayed, et al., 2017)**.

A pregnancy can be categorized as 'high risk' due to an increased likelihood of fetal abnormalities, potential health issues for the mother or fetus, and a significant risk of maternal or fetal mortality. **(Smorti, et al., 2023)**

A high-risk pregnancy is a condition where a woman is at an increased risk of facing complications throughout her pregnancy. About 15% of pregnant women experience severe complications during their pregnancy, as reported by the World Health Organization **(WHO, 2023).** Factors which can elevate the risk of a high-risk pregnancy encompass

conditions like gestational diabetes, preeclampsia, being older than 35, having had surgery on the uterus or cervix, or having long-term health issues. These conditions can result in significant problems such as restricted fetal growth, premature birth defects, and preeclampsia (**Beauquier-Maccotta et al., 2022).** Hence, studying high-risk pregnancies is crucial for recognizing risk factors, creating suitable treatments, and enhancing the management of pregnancy care **(McNestry et al., 2023).**

The recognition of a high-risk pregnancy can bring about additional stress, feelings of depression, anxiety, and uncertainty for an expectant mother. High-risk pregnant women may encounter particular challenges like restricted activity, hospital stays, bed rest, medical tests, treatments, doubts, and a sense of loss of control. **(Shagufta, et al 2022)**

A high-risk pregnancy can lead to various emotional reactions and potential impacts on the fetus. These impacts might involve premature delivery, low birth weight, hindered cognitive growth, heightened levels of cortisol, skin problems in early life, and a higher chance of respiratory disorders. **(Galbally, et al., 2023)**

Additionally, anxiety induced by high-risk pregnancies elicits a range of physiological responses. These responses arise as a consequence of the internal stress triggered by the activation of the fight or flight response. Blood pressure, Heart rate, respiratory rate and metabolism are all physiological responses that can be increased among women with high-risk pregnancies **(Information Resources Management, 2019)**

The effect of prenatal anxiety on the developing fetus is believed to be linked to alterations in the uterine environment during critical periods. One significant mechanism observed in humans involves the excessive exposure of the fetus to glucocorticoids, such as cortisol, due to stress affecting placental function. Stress can influence the enzyme responsible for converting cortisol to cortisone, this results in lower levels of the enzyme within the placenta, allowing for increased cortisol passage through the placental barrier to the fetus. Moreover, serotonin, a neurotransmitter, is involved in moderating the impact of prenatal stress on the cognitive and behavioral child growth. **(Yu, P.et al ., 2022)**

During pregnancy, poor sleep quality can be a common issue. This can manifest as difficulty falling asleep, waking up too early, or experiencing disruptions despite having the opportunity to rest. Factors such as physical discomfort, anxiety, and hormonal changes can contribute to sleep problems. As pregnancy progresses, sleep quality tend to deteriorate, leading to decreased efficiency and more frequent awakenings. The underlying causes include sympathetic activation and disturbances in the hypothalamic-pituitary-adrenal (HPA) axis (**Mundorf, & Ocklenburg, . 2021).**

Inadequate sleep has been connected to various negative findings, like functional and cognitive decline. It raises the likelihood of premature birth, preeclampsia, postpartum depression, fetal growth restriction, prolonged labor, cesarean section, and anxiety. Therefore, addressing poor quality of sleep is crucial in lowering the occurrence of high-risk pregnancies and enhancing the health of baby and mother. **(Lu, Q., et al., 2021)**

Typically, anxiety and poor sleep quality can be addressed through pharmacological or non-pharmacological means. Nevertheless, pharmacological methods are often avoided during pregnancy due to potential risks. On the other hand, non-pharmacological approaches can provide relief for pregnant women at an earlier stage. These approaches encompass various techniques such as therapeutic touch, pressure point therapy, acupuncture, relaxation techniques, group treatment, cognitive behavior treatment, yoga, and deep breathing exercises. **(Paulino, .et al., 2022)**

Relaxation methods are effective strategies for managing stress and enhancing overall well-being in expectant high-risk pregnancies by calming the mind and body. Benson's relaxation therapy, developed by physician Herbert Benson in the 1970s, focuses on promoting relaxation responses that reduce sympathetic arousal. This technique encourages individuals to practice daily in order to boost relaxation, improve mood, lower blood pressure, and reduce stressors in life. (**Teixeira et al., 2022)**

Benson relaxation, recognized as a relaxation response, has demonstrated efficacy in enhancing the functioning of the dysregulated hypothalamic–pituitary–adrenal axis across various chronic illness populations. Consequently, this technique can result in both immediate and sustained reductions in blood pressure, heart rate, and respiration rate. Thus, it facilitates the restoration and healing of both the body and mind by alleviating the physiological and psychological impacts of chronic stress. **(Information Resources Management, 2019)**

Benson relaxation, when implemented as a nursing intervention, has been shown to effectively lower depression levels among high-risk pregnancies women in hospital settings (Idiana, 2023). Additionally, it has been found to boost the levels of women's immune A (IgA) between postpartum individuals. Moreover, it helps in reducing depression, nervousness, and blood pressure. Furthermore, it results in enhanced maternal-fetal attachment and decreased anxiety levels in primigravida women. **(Cameron, et al., 2022).**

Benson relaxation is a method utilized to manage anxiety in women with high-risk pregnancies. This approach is centered on the belief that muscle relaxation and deep breathing can effectively alleviate anxiety and enhance psychological well-being **(Abera, et al., 2024).** During practicing Benson relaxation, expecting mothers are instructed to practice controlled and deep breathing, which entails taking slow breaths through the nose, filling the abdomen with air, and then slowly exhaling through the mouth. The primary objective of this breathing technique is to focus away from anxious thoughts and concentrate on deep and regular breathing **(Idiana., (2023).**

Furthermore, muscle relaxation plays a vital role in Benson relaxation. Expectant mothers are instructed to progressively release tension in different muscle groups, beginning with the face, neck, and shoulders, then progressing to the arms, and continuing down to the legs. This process helps pregnant women achieve a state of relaxation and tranquility in their minds and bodies. Benson relaxation can be applied in different settings such as at home, work, or in a serene atmosphere. It is recommended for pregnant women to set aside dedicated time each day to practice this method. They can enhance their practice by using guided audio or calming music to aid in their Benson relaxation exercises**. (Zenouzi ., 2021)**

Midwives are essential in providing support for the physical and emotional well-being of women experiencing high-risk pregnancies and addressing their comfort needs. They work closely with healthcare teams, implement stress-reducing interventions, assess the effectiveness of these interventions, and serve as counselors and educators by teaching women how to manage challenges and providing training on Benson relaxation techniques. **(Homer .,et al., 2019)**

Significance of the study

The pregnant woman at high-risk experiences various psychological reactions including anxiety, low self-esteem, and stress. Studies indicate that pregnant women report high levels of anxiety ranging from 6.0% to 16.7%, while they report mild to moderate anxiety levels ranging from 13.6% to 91.86%. Maternal anxiety during pregnancy has been associated with negative birth outcomes **(Zhang,et al., 2024)**. Anxiety during pregnancy can lead to complications such as postpartum depression, mood disorders, chronic hypertension, and an increased likelihood of unplanned cesarean delivery. Therefore, early detection of prenatal anxiety is crucial for pregnant women, as it can help in implementing appropriate therapeutic interventions to prevent further complications and adverse outcomes. **(Peltonen.,et al.,2023)**.

Although the Benson relaxation method can enhance relaxation to reduce anxiety, stress, tension, concern, and sleeplessness in obstetric and emergency situations, there is currently insufficient data to demonstrate its efficacy in reducing anxiety and enhancing sleep quality **(Idiana., 2023).** In order to provide solid research findings regarding the use of Benson relaxation therapy as an evidence-based nursing strategy for this group, the current study was carried out to ascertain the impact of the therapy on physiological parameters, quality of sleep, and anxiety levels in antenatal mothers with high-risk pregnancies.

Aims of the study

The study's objective is to**:**

Determine the effect of Benson`s relaxation therapy on sleep quality, physiological parameters, and anxiety level among antenatal mothers in high-risk pregnancies.

Research hypotheses:

- Hypothesis 0: antenatal mothers with high-risk pregnancies who obtain Benson's relaxation treatment demonstrate the same anxiety levels, sleep quality, and physiological parameters as those who do not.
- Hypothesis I: antenatal mothers with high-risk pregnancies who obtain Benson relaxation therapy experience better sleep quality than those who do not receive the therapy.
- Hypothesis II: antenatal mothers with high-risk pregnancies who undergo Benson relaxation therapy demonstrate more stable physiological parameters compared to those who do not undergo the therapy.
- Hypothesis III: antenatal mothers with high-risk pregnancies who undergo Benson relaxation therapy show lower anxiety levels compared to those who do not receive the therapy.

Subjects and Method

Subjects:

Research design:

A quasi-experimental design was employed in the current study. This design determines the causal effects of independent variables on one or more dependent variable despite a lack of randomization.

Settings:

The study was performed at the antenatal ward of obstetric and gynecological department of Damanhour National Medical Institute. This hospital was associated with the Ministry of Health in El-Beheira Governorate, Egypt. It included 2 rooms for admission of high-risk pregnancy where the researchers interviewed the recruited women to implement the Benson relaxation therapy. It was particularly chosen because it is a major hospital that serves Damanhour City and the surrounding areas. Also, the turnover was satisfactory for the study. It conducted approximately (5170) pregnant women annually according to its local statistics for the year 2023 (Obstetrics and Gynecological Department, Damanhour National Medical Institute, 2023).

Subjects:

A convenience sample of 80 postpartum women was selected from the aforementioned setting. Utilizing Epi Info 7 statistical software, the sample size was determined based on the subsequent parameters: a population size of 1,500 (over three months), a minimum sample size of 78, a final sample size of 80 to account for potential normal response, a predicted frequency of 50%, a tolerable error of 5%, and a confidence level of 95%. The study participants were selected according to the subsequent **inclusion criteria**:

- Pregnant women diagnosed with high-risk pregnancies were admitted to the antenatal ward of the Obstetric and Gynecologic Department at Damanhour National Medical Institute.
- Antenatal mothers diagnosed as high-risk pregnancies who are hospitalized for at least 5 days.

The chosen participants were randomly allocated in equal numbers to the study group (40) and the control group (40).

Tools: Three tools were employed:

Tool one: Socio-demographic and reproductive history structured interview schedule questionnaire: The researchers created this questionnaire following an assessment of the literature (**Maricic. Et al., 2021**. **Mohamoud, 2023**). It consists of three parts as detailed below: **Part I:** The socio-demographic characteristics: which encompassed data about occupational, education, age, family type, residence, and marital status. **Part II:** obstetric history: this consists of data on parity, gravidity, abortions, stillbirths, any previous health problems during pregnancy, type of last delivery, and mode of conception. **Part III**: History of current pregnancy: this encompassed data about gestational age by weeks, problems during the present pregnancy, and antenatal

visits. **Part IV: Vital signs checklist:** This part used to assess women`s vital signs by the researcher. It included blood pressure, pulse, respiration, and body temperature measurements. Vital signs assessed 2 times daily for 5 days.

Tool Two: The Groningen Sleep Quality Scale (GSQS): This scale for assessing patients' overall sleep quality, which was adopted from **Meesters et al. (1993)**, consists of 15 questions with a possible score of between 0 and 14, excluding the response to the first question. A score of 1 is given for a 'true' response to questions 2, 3, 4, 5, 6, 7, 9, 11, 13, 14, and 15, while a score of 1 is given for a 'false' response to questions 8, 10, and 12.

Total scoring system:

A scale score of 0–2 signifies normal, refreshing sleep; 3–9 signifies slightly disturbed sleep; and 10–14 represents poor quality sleep. Lower subjective sleep quality is indicated by a higher score. This scale was created for a validation study involving 80 depressed inpatients to examine sleep problems in depression. It had a mean score of 6.0 ± 4.2 and a Cronbach's alpha of 0.88, demonstrating high internal consistency.

Tool Three: **Perinatal Anxiety Screening Scale (PASS):** The 31-item PASS is a valid and accurate self-report tool used to test pregnant and postpartum women for problematic anxiety. By evaluating four dimensions, which address particular anxiety symptoms as they manifest in perinatal women, it distinguishes between women who are at low and high risk of displaying an anxiety condition. The following subscales are formed from these domains: Excessive Worry and Specific Fears, Social Anxiety, Perfectionism-Control and Trauma, and Acute Anxiety and Adjustment. (**Somerville, et al (2014).** Two hundred seventeen pregnant and postpartum women participated in a validation study where the Arabic translation of the PASS was assessed. The content validity ratio (CVR) was 0.79, while the content validity index (CVI) was 0.88. The scale's test-retest correlation coefficient was 0.94 and its Cronbach's Alpha score was 0.78. **(Jradi. H., et al .2020)**

The sum of all items on the PASS determines the total PASS score. A cut-off score of 26 is suggested to distinguish among low and high risk for the presence of an anxiety diseases. Anxiety Severity falls within the Asymptomatic range from 0 – 20, while Mild – Moderate anxiety is represented by a range of 21 – 41, and Severe symptoms range from 42 – 93.

Field work:

First phase (Preparatory phase):

- An ethical authorization from the Research Ethics Committee, of Damanhour University, Faculty of Nursing was received on 16 February 2023 before conducting the study.
- After defining the study's objectives, an official communication letter was sent by the Faculty of Nursing at Damanhour University to the pertinent authorities in the study locations, seeking their approval to gather data.
- The researcher obtained appropriate guidance and training on how to implement the Benson relaxation technique from a certified specialist in mental relaxation treatment in order to ensure the efficacyof the Benson relaxation therapy.
- The researchers designed tools one and two after an extensive review of related literature, while tools two & three were adopted.
- Tool III underwent translation into Arabic by bilingual experts specializing in Obstetric and Gynecological Nursing and Psychiatric Nursing and Mental Health. Subsequently, two bilingual English language experts performed the back translation, and necessary modifications were made based on their feedback.
- The tools were evaluated for content credibility by a panel of three expert professors in the field of Obstetric & Gynecologic Nursing and some. Modifications were made based on their feedback.

- A pilot study was performed on eight (10%) female participants to evaluate the clarity and practicality of the tools.
- Data collection occurred from early May 2023 through the end of August 2023.

Second phase (Implementation phase):

- Each antenatal woman who had the inclusion criteria was randomly allocated to either the study or control group.
- Individual interviews with mothers were conducted to gather information on their general characteristics, obstetric history, vital signs, anxiety level and data about quality of sleep. Each interview lasted between thirty and forty-five minutes.
- **For the control group**: Forty high-risk mothers were included in the study. They underwent routine hospital care under the supervision of the researchers, which involved procedures such as health education, routine investigations, physical examination, and history taking. The researchers initially focused on the control group until the desired sample size was achieved, then moved on to the study group to prevent sample contamination.
- **For the study group**: Involved 40 women at high risk pregnancy who were given the Benson Relaxation Therapy. The researchers explained the Benson's relaxation technique to the mothers, demonstrated it, and then asked the mothers to demonstrate it themselves while being observed by the researchers. The steps of Benson's relaxation are outlined as follows:
- The researchers ensured a clean and quiet environment for the mother, instructing her to sit comfortably, close her eyes, and deeply relax all muscles from her feet to her face. Following this, she was guided to breathe through her nose and focus on her breathing, silently saying a comforting word to herself as she exhaled. For instance, she was encouraged to inhale and exhale while repeating "Allah". As she exhaled, she was advised to reflect on positive moments in life. The mother breathed effortlessly and naturally, smiling as she inhaled and releasing the smile as she exhaled.
- The researchers instructed the mother to persist for 20 minutes. Following completion, she was advised to remain seated calmly for a few minutes, initially with her eyes closed and then with her eyes open, refraining from standing up for a brief period.
- Benson's relaxation therapy was conducted for twenty minutes, bi-daily for 5 days while being closely monitored by the researchers.

Third phase (Evaluation phase):

- Both groups underwent a follow-up at the hospital after 5 days. The physical evaluation of vital signs (blood pressure, respiration, pulse, and temperature) was conducted before the intervention and again five days later using tool two (post-test).
- The anxiety levels and sleep quality of high-risk women were assessed twice: prior to the intervention and again five days later, employing tools three and four.

Each group's vital signs, quality of sleep and anxiety level were compared pre- and post-intervention and the differences among the two study groups were determined.

Ethical considerations:

Each research participant provided informed written consent following a clarification of the goal of the study. The privacy of the data gathered, the subjects' freedom to withdraw at any moment, and their anonymity and privacy were all maintained.

Statistical analysis:

The data were entered into a computer and analyzed utilizing IBM SPSS software version 20.0. (Armonk, NY: IBM Corp). The data was presented utilizing descriptive statistics, such as means and standard deviations for quantitative variables, and frequencies and percentages for qualitative variables. Normality of quantitative data was assessed utilizing the Shapiro-Wilk test, with data considered normally distributed if $p \leq 0.05$. The $\chi 2$ test was employed to compare qualitative variables, while paired t-tests were used for quantitative variables. The significance between different stages was analyzed significance using McNemar and the Marginal Homogeneity Test,

with statistical significance set at p-value <0.05.

Results:

Table (1): Illustrates the socio-demographic characteristic of the study sample. It demonstrates that there was no statistically significant distinction in the sociodemographic characteristics among the study and control groups. The age varied between 20 to 38 years, with an average of 24.90 ± 4.08 for the study group and 25.48 ± 4.17 for the control group. Additionally, 35% of the study group had secondary education, in contrast to 25% of the control group. Furthermore, more than half of the studied groups (57.5% & 55%) rural dwellers. Finally, 65% and 72.5% of the study and control group had nuclear families respectively.

Table (2) Illustrate that slightly over half of the study and control group (52.5%,55%) were primigravida while more than half of the both groups are multi-paras (57.5%,55%) respectively. Eighty-five percent of the studied groups had no history of abortion, and the majority of both the study group (87.5%) and the control group (92.5%) did not experience stillbirth.

Table (3) The findings indicate that there was no statistically significant distinction concerning the history of the present pregnancy among the study and control groups. The study revealed that the women were between 6.0 and 38.0 weeks of gestation, with averages of 23.75 ± 11.0 weeks for the study group and 22.37 ± 11.44 weeks for the control group. Around two-thirds (65%, 57.5%) of the study group had regular antenatal visit and ≥ four visits respectively compared to 77.5%, 55% of the control group. Regarding High-risk problems, threatened abortion was reported by about one quarter 27.5%, 22.5% of both groups respectively while 15% of the study group complaining from hyper emesis graviderum compared to 25% of the control group. Over than two-fifths 45% of the study group diagnosed with placenta previa compared to around one-third 32.5% of the control group. In addition, 12.5% and 20% of the study and control group diagnosed with preeclampsia respectively.

Table (4): reveals the distribution of women in the study and the control groups concerning their vital signs pre- and post-intervention. Prior to the intervention, 27.5% of the study group had a temperature between 37.1°C and 37.5°C, in contrast to 22.5% of the control group. On the fifth day after the intervention, over half of the study group (55%) had temperatures ranging from 37.1 to 37.5°C, whereas only 32.5% of the control group exhibited temperatures within this range. Also, there was a statistically significant distinction (p=0.035) among the study group's pre- and post-intervention differences. Moreover, there was a statistically significant distinction among the study and control groups after the intervention (P=0.043).

Regarding systolic blood pressure, the mean systolic blood pressure was 122.3 ± 13.10 among study group compared to 125.3 ± 14.32 of control group before the intervention. On the fifth day post-intervention, the average systolic blood pressure in the study group dropped to 117.8 ± 8.32, compared to 124.3 ± 11.07 in the control group. The difference within the study group pre- and post-intervention was highly statistically significant (P = 0.027), as was the difference among the two groups (P = 0.004).

Before the intervention, the mean diastolic blood pressure was 80.75 ± 8.29 in the study group, while in the control group it was 81.0 ± 9.55. On the fifth day after the intervention, the mean systolic blood pressure in the study group fell to 77.25 ± 5.54, compared to 80.75 ± 6.56 in the control group. The difference within the study group pre- and post-intervention was highly statistically significant (P = 0.014), as was the difference among the two groups (P = 0.012).

Before the intervention, the mean pulse rate was 95.37 ± 7.47 in the study group and 95.0 ± 8.98 in the control group. . On the fifth day after intervention, it dropped to (86.35 ± 5.30) among the study group. However, in the control group, the mean pulse rate was still high on the fifth day after intervention (94.50 ± 7.69) with a highly statistically significant distinction among the study group pre- and post-intervention and among both groups (P< 0.001).

Women at high risk who practiced Benson relaxation therapy underwent a significant reduction in respiration rate by the fifth day of the intervention, whereas the control group showed no variation. The study demonstrated substantial statistical variance both within the intervention group before and after the treatment and among both groups (P<0.001).

Table (5): Demonstrates improvement in sleep quality within both the study and control groups pre- and post-intervention. Prior to the intervention, 77.5% of individuals in the study group reported poor sleep quality, while none of them (0.0%) continued to experience poor sleep quality after the intervention. In the control group, 92.5% of participants reported poor sleep quality prior to the intervention, decreasing to 87.5% after the intervention. On the other hand, the study group demonstrated a significant enhancement in sleep quality, with the percentage of subjects experiencing normal refreshing sleep increasing from 12.5% to 80% post-intervention. The control group only saw a slight increase from 7.5% to 12.5%. The mean quality of sleep dropped significantly from 10.60 ± 3.97 to 2.73 ± 2.76 in the study group, while the control group maintained a high mean quality of sleep even after the fifth day of intervention. The findings indicated a highly statistically significant distinction among the study and control groups, both pre- and post-intervention (P < 0.001).

Figure (1) illustrates the distribution of the studied groups according to their anxiety levels pre- and post-intervention. Prior to the intervention, 85% of the study group exhibited severe anxiety symptoms, while 87.5% of the control group showed the same. After the Benson relaxation therapy intervention, all participants in the study group no longer had severe anxiety symptoms, in contrast to 77.5% of the control group. Additionally, there was a notable rise in the percentage of study group participants with asymptomatic anxiety, rising from 15% before the intervention to 75% after. This difference was highly statistically significant among both groups. (P= 0.000).

Table (1): The distribution of the study and control groups based on their sociodemographic properties. (n=80)

Socio-demographic characteristic	Study (n = 40)		Control (n = 40)		Test of Sig.	p
	No.	%	No.	%		
Age (Years)						
20-24	24	60.0	21	52.5	χ^2= 0.458	0.795
25-29	11	27.5	13	32.5		
≥ 30	5	12.5	6	15.0		
Min. – Max.	20.0 – 38.0		20.0 – 38.0		t= 0.614	0.541
Mean ± SD.	24.90 ± 4.08		25.48 ± 4.17			
Level of education						
Illiterate /Read and	10	25.0	11	27.5	χ^2= 1.518	0.678
Prep /sec	9	22.5	13	32.5		
Secondary	14	35.0	10	25.0		
Faculty and more	7	17.5	6	15.0		
Residence						
Rural	23	57.5	22	55.0	χ^2= 0.051	0.822
Urban	17	42.5	18	45.0		
Family type						
Nuclear	26	65.0	29	72.5	0.524	0.469
Extended	14	35.0	11	27.5		

SD: **Standard deviation** **t: Student t-test**

χ^2: **Chi square test**

p: p value for contrasting among the studied groups

Table (2): Number and percent distribution of the study and control groups based on their reproductive history. (n=80)

Reproductive history	Study (n = 40)		Control (n = 40)		Test of Sig.	P
	No.	%	No.	%		
Gravidity						
1	21	52.5	22	55.0	= 2 χ	FEp=
2	11	27.5	10	25.0	0.071	0.965
3	8	20.0	8	20.0		
Parity						
1	17	42.5	18	45	χ^2=	0.82
2	23	57.5	22	55	0.05	
No. of abortion						
No	34	85.0	34	85.0	χ^2=	MCp=
1	5	12.5	6	15.0	1.064	1.000
2	1	2.5	0	0.0		
Still birth						
No	35	87.5	37	92.5	χ^2=	FEp=
Yes	5	12.5	3	7.5	0.556	0.712

MC: **Monte Carlo** FE**: Fisher Exact**

Table (3): Number and percent distribution of the study and control groups based on history of current pregnancy. (n=80)

History of current pregnancy	Study (n = 40)		Control (n = 40)		Test of Sig.	P
Weeks of gestation						
Min. – Max.	6.0 – 38.0		6.0 – 38.0		t=0.548	0.585
Mean ± SD.	23.75 ± 11.0		22.37 ± 11.44			
Antenatal visits						
Regular	26	65.0	31	77.5	χ^2=	MCp=
Irregular	14	35.0	9	22.5	1.52	0.12
No. of antenatal visits						
<4	17	42.5	18	45		
≥4	23	57.5	22	55	χ2= 0.05	0.82
High risk problems						
Threatened abortion	11	27.5	9	22.5		
Hyper emesis gravedirum	6	15.0	10	25.0	χ^2=	0.440
Placenta previa	18	45.0	13	32.5	2.699	
Pre-eclampsia	5	12.5	8	20.0		

Table (4): Number and percent distribution of the study and control groups based on **their ante-natal clinical profile (Vital signs) .(n=80)**

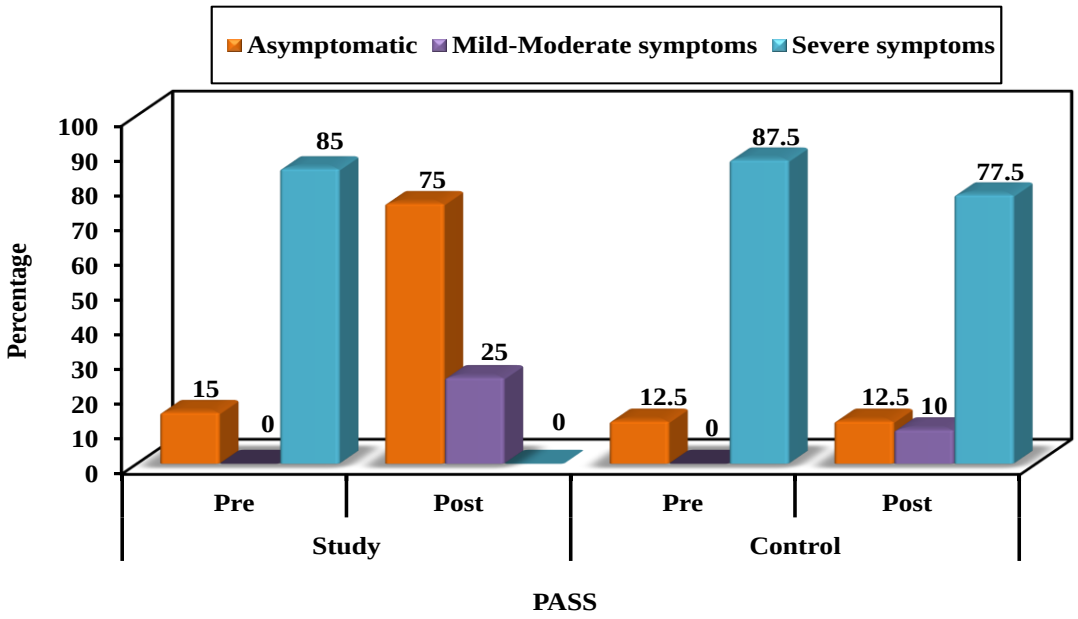
Antenatal physiological parameters (Vital signs)	Study (n = 40)				Control (n = 40)				Test of Sig. (p_1)	Test of Sig. (p_2)
	Before		After		Before		After			
Temperature										
35.5 – 37	29	72.5	18	45.0	31	77.5	27	67.5	χ^2=0.267 (0.606)	χ^2=4.114* (0.043*)
37.1 - 37.5	11	27.5	22	55.0	9	22.5	13	32.5		
McN (p_0)	0.559* (0.035*)				0.755 (0.424)					
Systolic										
Min. – Max.	100.0 – 150.0		100.0 – 130.0		100.0 – 150.0		100.0 – 140.0		t=0.977 (0.331)	t=2.969 (0.004*)
Mean ± SD.	122.3 ± 13.10		117.8 ± 8.32		125.3 ± 14.32		124.3 ± 11.07			
t_0 (p_0)	2.296* (0.027*)				0.371 (0.713)					
Diastolic										
Min. – Max.	70.0 – 100.0		70.0 – 90.0		60.0 – 100.0		70.0 – 90.0		t=0.125 (0.901)	t=2.578 (0.012*)
Mean ± SD.	80.75 ± 8.29		77.25 ± 5.54		81.0 ± 9.55		80.75 ± 6.56			
t_0 (p_0)	2.563* (0.014*)				0.144 (0.886)					
Respiratory										
Min. – Max.	16.0 – 29.0		16.0 – 25.0		16.0 – 30.0		16.0 – 30.0		t=1.895 (0.062)	t=6.233* (<0.001*)
Mean ± SD.	23.0 ± 3.32		19.98 ± 2.75		24.28 ± 2.66		24.05 ± 3.09			
t_0 (p_0)	4.532* (<0.001*)				0.297 (0.768)					
Pulse										
Min. – Max.	80.0 – 110.0		80.0 – 96.0		80.0 – 109.0		85.0 – 110.0		t=0.203 (0.840)	t=5.520* (<0.001*)
Mean ± SD.	95.37 ± 7.47		86.35 ± 5.30		95.0 ± 8.98		94.50 ± 7.69			
t_0 (p_0)	6.524* (<0.001*)				0.263 (0.794)					

p_0: p value for contrasting between **pre** and **post** in each group
p_1: p value for contrasting among the studied groups in **pre**
p_2: p value for contrasting among the studied groups in **post**
*: Statistically significant at $p \leq 0.05$

Table (5): Comparison between the two studied groups based on **overall quality of sleep. (n=80)**

Quality of Sleep	Study (n = 40)				Control (n = 40)				Test of sig. (p_1)	Test of sig. (p_2)
	Before Intervention		After 5 days		Before Intervention		After 5 days			
	No.		No.		No.		No.			
Normal refreshing sleep (0-2)	5	12.5	32	80.0	3	7.5	5	12.5	4.739 (^{MC}p= 0.110)	74.327* (<0.001*)
slightly disturbed sleep (3 – 9)	4	10.0	8	20.0	0	0.0	0	0.0		
Poor quality of sleep (10 – 14)	31	77.5	0	0.0	37	92.5	35	87.5		
Test of sig. (p_0)	MH=73.000* (<0.001*)				McN= 0.556 (0.500)					
Total score (0 – 63)										
Min. – Max.	0.0 – 14.0		0.0 – 9.0		0.0 – 14.0		0.0 – 14.0		t=1.179 (0.242)	t=10.787* (0.001*)
Mean ± SD.	10.60 ± 3.97		2.73 ± 2.76		11.58 ± 3.40		11.0 ± 3.99			
Test of sig. (p_0)	12.652* (<0.001*)				1.358 (0.182)					

Figure (1): Comparison between the two studied groups based on **overall of Perinatal Anxiety Screening Scale.(n=80).**



Discussion

A high-risk pregnancy may result in significant complications, including restricted fetal growth, birth defects, preeclampsia, and preterm birth. Research on high-risk pregnancy is crucial for identifying risk factors, developing suitable interventions, and enhancing pregnancy care management. Additionally, the health of the expectant mother may also be impacted, leading to a higher likelihood of organ disorders, high blood pressure, and underlying health issues **(Beauquier-Maccotta et al., 2022).** This emphasizes the significance of focusing on high-risk pregnancy in order to address these potential complications **(Bedaso et al., 2021, Mappa et al., 2020).**

The utilization of the Benson Relaxation Technique as an adjunct therapy has been shown to have a beneficial impact on decreasing anxiety levels in primigravida pregnant women who are at high risk during their pregnancies. This technique effectively diminishes sympathetic nervous system activity, which results in the dilation of arteries and enhanced blood and oxygen circulation to the tissues of the body. Additionally, it has been found to assist in reducing blood pressure, enhancing the quality of the sleep, and alleviating anxiety **(Idiana. 2023, Masoudi et al., 2022)**. Thus, this study intended to evaluate the impact of Benson's relaxation therapy on anxiety levels, the quality of the sleep, and physiological parameters in antenatal mothers with high-risk pregnancies.

Evaluating the effect of Benson relaxation on vital signs between antenatal mothers with high-risk pregnancies. The findings of this study indicate that there are highly statistically significant distinctions in the vital signs of the study group pre- and post-intervention. Along with the comparison among the study and control groups post-intervention. In the study group, respiration rate, diastolic blood pressure, systolic blood pressure, and heart rate decreased after the intervention, in contrast to the control group (table V).

This aligns with the research indicating that Benson relaxation is a non-pharmacological method that hinders the sympathetic nervous system and activates the parasympathetic nervous system by interrupting the feedback loop from the brain, thereby averting the biological response. As a result, it reduces

metabolic rate, heart rate, and blood pressure by inducing a relaxation response **(Lindquist, et al, 2022).**

The current outcomes are consistent with the Egyptian study by Farhat et al. (2024). The study revealed a significant decrease in the total mean value of systolic blood pressure from pre-test (158.2 ± 9.6) to post-test (144.5 ± 1.4), and in diastolic blood pressure from pre-test (106.9 ± 9.7) to post-test (90.9 ± 1.8) among the studied women.

The results of a study also align with the same outcome of (**Valiani., et al,2023)** who study the impact of Body Relaxation Techniques on Pre-Eclampsia Syndrome among Iranian women. The findings portrayed that using Benson methods during relaxation sessions lead to significant decreased the diastolic and systolic blood pressure of the high-risk mothers after the intervention.

The present study closely matched the research conducted by **Ibrahim et al. (2022),** which found no significant statistical variance in physiological parameters (blood pressure, respiration, pulse, and temperature) between the groups before the intervention. Nonetheless, a significant statistical distinction emerged between the groups after the intervention, with the study group demonstrating superior performance in relation to the control group.

During pregnancy, the incidence of poor sleep quality is more common, with nearly 97 percent of pregnant women experiencing disrupted sleep, particularly in the final three months. This is due to increased sympathetic activity and disturbances in the hypothalamic-pituitary-adrenal (HPA) axis. **(Coelho., 2022).**

Regarding the influence of the Benson relaxation technique on sleeping quality, The result of the present study reveals improvement on the quality of sleep between the study and control groups before and after the intervention where the mean quality of sleep decline from 10.60 ± 3.97 that indicates lower subjective quality of sleep to 2.73 ± 2.76 among the study group. But in control group the mean quality of sleep still high on the fifth day after intervention with a highly statistically significant distinction on the study group pre- and post-intervention and between both groups (P= 0.001). The findings may be attributed to the effectiveness of the Benson relaxation method in promoting relaxation, maintaining healthy blood pressure levels, enhancing circulation, and improving muscle relaxation. This conclusion is supported by the research of **Phansikar & Mullen (2022),** who found that such exercises facilitate the transition to the parasympathetic nervous system, promoting both physical and mental tranquility.

This conclusion aligns with the findings of **Ibrahim et al. (2022),** who discovered that Benson Relaxation had a highly significant and effective impact on enhancing sleep quality in the study group in comparison to the control group. Additionally, the vast most of the study group experienced improved sleep quality after the intervention, in contrast to a very small percentage of the control group, with a statistically significant variance (P=0.000). This research proposes that the Benson relaxation technique could improve sleep quality in women with gestational hypertension.

Maternal anxiety impacts the levels of inflammatory markers in circulation through the elevation of proinflammatory cytokines interleukin and tumor necrosis factor, while simultaneously reducing anti-inflammatory cytokine levels. These inflammatory markers hinder the immune system response, leading to a higher vulnerability to negative pregnancy outcomes like preterm birth (PTB). Subsequently, women facing adverse pregnancy complications that necessitate premature delivery or lead to maternal and neonatal health issues may encounter further stress. **(Tanpradit, & Kaewkiattikun, .2020)**

Concerning the average score of anxiety scale, the current study findings indicated a notable decrease in stress levels among the study participants after engaging in Benson's relaxation therapy, as evidenced by the average stress scale scores pre and post intervention (Figure 1). This decrease in anxiety levels can be attributed to the enhancement of the relaxation response through the practice of Benson's relaxation therapy. The relaxation response refers to an individual's capacity to trigger the release of chemicals and brain

signals that promote muscle and organ relaxation, while simultaneously increasing blood flow to the brain. Furthermore, all relaxation response techniques are associated with a reduction in stress hormones and a decrease in central nervous system activity, as indicated by measurable changes in brain wave patterns.

The current findings align well with the outcomes of a study performed by Zenouzi et al. (2021) in Iran. Their results indicated that Benson Relaxation Therapy could significantly promote mental calmness for the well-being of both the mother and the fetus, helping to alleviate anxiety, stress, and depression in pregnant women.

Similarly, a study performed by **Abd Elgwad, et al. (2021)** focused on an Egyptian study involving 80 pregnant women to analyze the Impact of Benson's Relaxation Therapy on Physiological Parameters and Stress in Women with Preeclampsia. The findings of this study demonstrate that Benson relaxation therapy (BRT) plays a positive role in decreasing stress levels in women with pre-eclampsia. Furthermore, it shows a significant impact on keeping physiological parameters (such as respiratory rate, pulse rate, and blood pressure) within normal ranges.

Furthermore, an additional study conducted by **El-Sayed., et al (2017)** in Egypt provided further support. This study focused on Benson's Relaxation Therapy and its impact on coping and stress in mothers with high-risk pregnancies. The results of this research suggested that Benson's relaxation therapy can be beneficial in enhancing maternal psychological well-being by decreasing stress levels and improving coping mechanisms in high-risk pregnant women.

Conclusion

Considering the outcomes of the current study, it is evident that: Hypothesis (H1), hypothesis (H2), and hypothesis (H3) have been confirmed as the study demonstrated that Benson relaxation therapy (BRT) positively impacts stress reduction and enhances sleep quality in high-risk pregnant women. Furthermore, BRT has shown significant effectiveness in regulating physiological indicators, such as respiratory rate, pulse rate, and blood pressure to optimal levels.

Recommendations

- Maternity nursing services should consider implementing the Benson relaxation technique as part of the standard non-pharmacological management in a high-risk unit.
- The Benson relaxation method is an affordable, highly efficient, and user-friendly therapy for women experiencing high-risk pregnancies. Therefore, it is recommended that the nursing team incorporate these techniques into the care plan for this particular group of expectant mothers.
- The Benson relaxation technique for women with high-risk pregnancies should be incorporated into core nursing education programs and continuous professional development initiatives. Regular in-service training sessions for nurses, like conferences and seminars, ought to be held to make sure they are knowledgeable of the advantages of the Benson relaxation technique and how to apply it.

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