The effect of Benson relaxation therapy on anxiety and the quality of sleep among preeclamptic women

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Abstract: Background: Pre-eclampsia (PE) a syndrome that occurs during pregnancy that results in real risk and a significant impact on indicators related to maternal and child physical and psychological health. Therefore, this study aimed to investigate the effect of Benson relaxation therapy on anxiety and the quality of sleep among pre-eclamptic women. A non-randomized controlled clinical trial research design was used. A simple random sample of 80 pre-eclamptic women were randomly divided into two equal groups, namely; study group and control group were chosen from El-Shatby Maternity University Hospital in eclamptic and intensive care unit. **Tools of the study:** three tools were used: (1) The socio-demographic and antenatal profile questionnaire, (2) Beck Anxiety Inventory (BAI) (3) The Groningen Sleep Quality Scale (GSQS). **Results**: The study results revealed a highly statistically significant difference between the study and control groups in relation to decrease their anxiety and increase their quality of sleep after the intervention (p=0.001). Also, the anxiety was negatively correlated was quality of sleep. **Conclusion:** Benson relaxation can be used as an effective intervention to decrease anxiety and improve the quality of sleep. **Recommendation**: Benson relaxation technique is an effective intervention for pre-eclamptic women and thus should be included in the nursing care plan of this group of pregnant women.

Keywords: Benson relaxation therapy, anxiety, quality of sleep and pre-eclamptic women.

Introduction

Pregnancy induced hypertension (PIH) is a very stressful and distressing pathological condition that is defined as a sustained rise of blood pressure to 140/90 mm Hg or more on at least two occasions, four or more hours apart ,beyond the 20th week of pregnancy or during the first 24 hours after delivery in a previously normotensive woman. The etiology remains unknown and it is also more common in pregnant teenagers and over 40 years [1]. More drastically, PIH not only threaten the health and wellbeing of the mother but also may compromise fetal development and cause severe pre-natal and postnatal complications in the offspring [2].

Expectant women, in this critical situation of having a high-risk pregnancy, face psychosocial distress of facing a seriously life threatening situation and at the same time, abruptly being removed from their support system and familiar surroundings are at risk of developing alarming variant levels of anxiety. Moreover, women with high-risk pregnancies are vulnerable to emotional drain, as well as feelings of uneasiness and insecurity regarding their lives and the lives of their children leading to increased and more distracting levels of

anxiety [3]. Consequently, they may experience feelings of guilt and/or inadequacy, leading to further psychological problems and complexities for the pregnant women as having feelings of ambivalence, frequent mood changes, developing depressive reactions and exhibiting poor quality of sleep [4].

Anxiety as one of the troubling but expected psychological disturbances that may occur during high risk pregnancy may be an inevitable reaction to feeling unsafe or threatened. Biologically, it is generated by the changes in the secretion of vasoactive hormones or other neuroendocrine transmitters, which can lead to an enhanced risk of gestational hypertension. Additionally, with rapid trimester-specific changes, there are physiological changes in the mother's body weight, size and abilities that usually leads to discomfort and results in body and self-dissatisfaction. This dissatisfaction has been linked to increased perinatal symptoms of anxiety and antenatal anxiety [5, 6].

The elevated and sustained feelings of anxiety and uneasiness interfere with the pregnant women's daily functions and activities. Additionally, anxiety may result in negative impacts on mental health of the pregnant woman manifested in the form of feeling nervous, restless or tense, having a sense of impending danger, trouble concentrating [7]. Previous studies claimed that high levels of anxiety during pregnancy is very dangerous and increase risk of developing preeclampsia. As for the offspring, pregnant women with high anxiety level were correlated with increased incidence of premature birth and low birth weight with highly reported changes in the fetal brain morphology [8]. Increased maternal anxiety level may additionally lead to fetal loss, limited fetal growth and asphyxia. It is also suggested that infants of women with high maternal anxiety may show impaired fetal bonding and attachment, long-term behavioral, emotional and cognitive issues as toddlers and even into adolescent years [9].

Poor quality of sleep is another problem that may occur during pregnancy. It is defined as difficulty in initiating sleep or waking up too early, or the difficulty that occurs despite the adequate opportunity and circumstances for sleep. Poor quality of sleep may be associated with some form of daytime impairments as fatigue, low energy, mood disturbance and excessive concern or worry [10]. The incidence of poor quality of sleep is higher during pregnancy compared with the non-pregnant population where up to 97% of pregnant women report disturbed sleep, particularly in the third trimester of pregnancy. It is caused by sympathetic activation and hypothalamic-pituitary-adrenal (HPA) axis disturbance so, elevated blood pressure in pregnancy can have devastating effects on the pregnant women [11].

Poor sleep quality has been linked to numerous negative outcomes including cognitive and functional impairment. It increases the risk of preterm labor, anxiety, cesarean delivery, prolonged labor, intrauterine growth retardation, postpartum depression and preeclampsia. Management of poor quality of sleep is thus important to reduce high blood pressure and improve maternal and fetal wellbeing [12].

In general, both pharmacological and non-pharmacological approaches to relieve anxiety and poor quality of sleep are used. However, during pregnancy most pharmacological methods are rarely used because of the concerns regarding adverse effects. Meanwhile, non-pharmacological approaches can help women cope with their pregnancy much earlier. These approaches may include massage, acupressure, acupuncture, breathing exercises, yoga, mindfulness, cognitive behavior therapy, group therapy and relaxation techniques [13].

As for relaxation techniques, they are a type of complementary alternative therapy (CAT) that is well known as an anxiety-reducing intervention. It has shown great effects on both the mother and fetus during pregnancy as it helps the expected mother cope with anxiety and promote long term health in antenatal period by slowing down the body and quietening the mind. One of these relaxation techniques is Benson relaxation therapy developed by Dr. Herbert Benson (2010). It was proved to produce significant changes in physical and emotional responses to stress. It was also documented to have positive effects on a wide range of physical and mental problems such as pain, anxiety, mood disorders, self-confidence, depression, and stress among primigravida females [14].

Significance of the study

According to the WHO (2014), PIH is the third cause of maternal mortality. It was found that it affects about 5% - 8% of pregnant women around the world, while in Egypt; it complicates 6% - 8% of pregnancies and reaches 15% in referral centers. Most of maternal deaths are preventable, as the health-care solutions to prevent or manage complications are well known. [15]. When Benson relaxation is integrated as an element of hospital PIH protocol; less pharmacological drug may be desired, with the added benefit of hardly any adverse effects [(16)]. Benson relaxation technique can promote relaxation to decrease stress, anxiety, worry and insomnia among obstetric and emergency, but there is still a lack of evidence to support its effectiveness on decrease anxiety and improve quality of sleep. The present study was conducted to determine the effect of Benson relaxation therapy on anxiety and the quality of sleep among pre-eclamptic women to provide sound research findings in relation to using it as an evidenced-based nursing strategy for this group.

1. Aim of the study

This study aims to:

Investigate the effect of Benson relaxation therapy on anxiety and the quality of sleep among pre-eclamptic women.

2. Research hypothesis:

- Pre-eclamptic women who receive Benson relaxation therapy exhibit less anxiety levels than those who don't receive it.
- Preeclamptic women who receive Benson relaxation therapy exhibit improved quality of sleep than those who don't receive it.

Materials and methods

Materials

Study design:

This is a non-randomized controlled clinical trial research design where the effect of one independent variable (Benson relaxation) among eclamptic women on two dependent variables (anxiety and quality of sleep) was investigated.

Setting:

The study was conducted at El-Shatby Maternity Hospital in Alexandria. The hospital is affiliated with Alexandria University. The study was carried out in the eclamptic unit and the intensive care unit. This eclamptic unit contains (10) bed and intensive care unit contains (9) beds.

Subjects:

The subjects of the study included 80 pre-eclamptic women admitted in the pre-eclamptic unit and intensive care unit. Then, pre-eclamptic women were equally randomly assigned to either study group or control group. Every group included 40 preeclamptic women as follows:

- Study group: preeclamptic women who will receive the Benson Relaxation Therapy.
- Control group: preeclamptic women who will receive the routine care of the hospital.

Recruitment of subjects to the two groups were done as follows: The first 40 women who met the inclusion criteria were assigned to the control group. The next 40 women who met the inclusion criteria were assigned to the study group. This was done to avoid exposure of the control group to the study intervention to avoid contamination of the data.

The Epi info program was used to estimate the sample size based on 10% acceptable error, 95% confidence coefficient, 50% expected frequency and a population size of 1500. The program revealed that the minimum sample size is 78. Women were selected to be included in the study according to the following criteria:

- Mothers diagnosed preeclampsia.
- Mothers in next 20 weeks of gestation.
- Mothers staying at the hospital for 3 consecutive days.

Tools:

Three tools were used to collect the data:

Tool I: The socio-demographic and antenatal profile questionnaire:

This questionnaire was developed by the researchers after the review of literature. It is composed of three parts as follow:

Part I: The socio-demographic data: which included data about age, education, occupational status, marital status, residency, the type of family and whether the woman is a family relative to her husband.

Part II: obstetric history: this included data about: number of paras, gravida, abortions ,still birth, mode of conception, type of previous delivery and any previous health problems prevent pregnancy occur, previous health problems during pregnancy, labor and postpartum ect.

Part III: History of present pregnancy: this included data about weeks of gestation, antenatal visit, Problem during current pregnancy and vital signs.

Tool II: Beck Anxiety Inventory (BAI):

This scale is a self-report measure of anxiety that was developed by Beck, Epstein, Brown, & Steer (1988) [17]. The scale contains 21 items. The total score is calculated by finding the sum of the 21 items where scores (Likert type) ranging 0-21 represents low anxiety, scores ranging 22-35 represent moderate anxiety and scores of 36 and above represent potentially concerning levels of anxiety. The BAI has shown acceptable internal consistency (Chronbach Alpha = 0.92) and good test retest reliability (r =0.75).

Tool III: The Groningen Sleep Quality Scale (GSQS):

This scale is a tool that can be used to understand the subjects' patterns in overall sleep quality. It is composed of 15 questions that assess the individual sleeping pattern. The scoring system of this scale is as follows; the first question doesn't count toward the total score. For questions 2, 3, 4, 5, 6, 7, 9, 11, 13, 14, 15 one point is given if the answer is "True". For questions 8, 10, 12 one point is given if the answer is "False". The scale scores range from 0 to 14 where a higher score indicates lower subjective quality of sleep. The total score of (0-2) represents normal refreshing sleep. For the purpose of this study, the range between (3-9) was considered slightly disturbed sleep and (10-14) was considered the poor quality of sleep. Originally, the scale was created to study sleep problems in depression. In a validation study with 80 depressed inpatients. The mean score on the scale was 6.0 ± 4.2 and Cronbach's alpha for internal consistency was 0.88[18].

Methods:

- Written permissions to conduct the study were obtained from the head of the Obstetrics & Gynecologic Nursing Department and the medical director of El-Shatby Maternity University Hospital after explaining the purpose of the study.
- Tool I, the socio-demographic and antenatal profile was developed by the researchers after an extensive review of the literature for needed history.
- Tool II and tool III were translated to the Arabic language by bilingual experts in both field of Obstetric and Gynecological Nursing and Psychiatric Nursing and Mental health, then back translation was done by two bilingual English language experts and modifications were done accordingly.

- A jury of five experts in Obstetric and Gynecological Nursing and Psychiatric Nursing and Mental health evaluated the validity of the scales and reported that the scales had face and content validity.
- A pilot study was carried out on 5 preeclamptic women to ensure the applicability of the study tool and the Benson Relaxation technique.
- The preeclamptic ward at El-Shatby Maternity Hospital in Alexandria was visited and the patients' charts were reviewed for inclusion criteria.
- The first 40 women who met the inclusion criteria were assigned to the control group. The next 40 women who met the inclusion criteria were assigned to the study group. The data were collected over four months starting at the 3rd of October 2019 and ending at 25th January 2020.

Actual Study:

- An informed written consent was obtained from the studied subjects.
- The pretest was done for both groups individually using tools I, II and III.

For the control group:

They received the routine hospital care for a pre-eclamptic woman in the presence of the researchers which included procedures as (history is taken, physical examination, routine investigations and health education). The researchers started with the control group until the required number was reached and then was followed by the study group to avoid contamination of the sample.

For the study group

The study group received the Benson Relaxation Therapy .This therapy was implemented in three phases (preparation, implementation and evaluation phase)

1. **preparation phase:**
   - Before implementation of the Benson relaxation technique the following steps were done with the studied subjects:
     - Explain the needs and usefulness of the therapy to the patient.
     - Explain the procedure.
     - The researchers explained how to do Benson Relaxation Technique and performed it in front of the woman then asked her to demonstrate it.
     - Maintain a good interpersonal relationship.
     - Provide a calm and quiet environment with adequate ventilation.
     - Advice the client to sit in a comfortable position (sitting position) with hands naturally resting in the lap.
2. **Implementation phase:**

   -Each pre-eclamptic woman of the study group was interviewed individually for 30 minutes three times daily for consecutive 3 days.

   -Procedure: the following steps were applied to the studied subjects.

- Step1: Gently close the eyes, relax the muscles and quiet the mind by taking a few deep breaths.
- Step2: Breath in and out slowly and naturally by concentrating on expansion and contraction of chest.
- Step3: Breathe in naturally and slowly, when breathing out say some prayer words silently to your self.
- Step 4: Breathe in deeply and breathe out slowly.
- Step 5: When breathing in say the word "calm" and while breathing out say the word "freedom" to yourself.
  - When breathing in a smile and while breathing out release smile.
- Step 6: Breathe in slowly and naturally, when breathing out say the word "peace" to yourself silently.
- Step 7: Breathe in slowly and naturally, when breathing out, think about the wonderful moments happening in life. Continue the above steps for 10-20 min.
- Step 8: Say the word "oh well" silently.
- Slowly open your eyes and relax for a few minutes.

3. **Evaluation phase:**
   - Physical evaluation of vital signs (Temperature, Pulse, Respiration and Blood pressure) in both groups were measured before implementation and after three days later.
   - Pre-eclamptic women' Anxiety level and quality of sleep were assessed twice before implementation and after three days later using the study tools.

- **Ethical consideration** was maintained by obtaining the appropriate approvals, the informed consent and by assuring the participants that their decision to be included or not in the study will not affect their care in any means at that they are free to withdraw at any point of time in the study. Their privacy and confidentiality were maintained.

Statistical analysis

Data was fed to the computer using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were coded, categorized and described using number and percent. Quantitative data were described using range, mean and standard deviation. The significance of the obtained results was judged at the 5% level. To compare between groups, Chi-square test and Fisher's Exact or Monte Carlo correction, McNemar and Marginal Homogeneity Test, Student t-test, F- test and Pearson coefficient were used.

Results

Table (I) shows the number and the percent distribution of the study subjects according to their socio-demographic characteristics. As regards ***age***, it was found that half and more (52.5 & 55 %)of the study and control groups were 20 to 24 years old, while the rest of them 27.5% & 25% and 20% aged between 25 to 29 and 30 to 39 years old respectively. However, the mean ages of the study and control groups were 26.20 ± 5.81and 25.55 ± 4.70

respectively. Concerning, ***education*** near to half (42.5% &47.5%) of the study and control groups were able to read and write and around one third (27.5%, 32.5%) of them had preparatory school respectively. In addition, ***original residence*** and ***type of family*** a sizeable proportion of the study subjects (87.5% & 82.5%) and (85.0% & 87.5%) in the study & control groups were urban dwellers and extended family, while only 12.5% & 17.5% and 15.0%, 12.5% of them were rural dwellers and nuclear family respectively. No statistically significant differences were found between the study and control groups in relation to socio-demographic data. This means that both groups matched regarding the socio-demographic characteristics.

Table (1):Number and percent distribution of the study subjects according to their socio-demographic characteristics.

Socio-demographic characteristics	Study (n = 40)		Control (n = 40)		Test of sig.	p
	No.	%	No.	%		
Age (years)						
20 – 24	21	52.5	22	55.0		
25 – 29	11	27.5	10	25.0	χ^2= 0.071	0.965
30 – 39	8	20.0	8	20.0		
SD.±Mean	5.81±26.20		4.70±25.55		t=0.551	0.583
Level of education						
Read and write	17	42.5	19	47.5		
Preparatory school	11	27.5	13	32.5	χ^2= 1.414	^{MC}p= 0.781
Secondary school	11	27.5	7	17.5		
University	1	2.5	1	2.5		
Original residence						
Rural	5	12.5	7	17.5	χ^2= 0.392	0.531
Urban	35	87.5	33	82.5		
Type of family						
Nuclear	6	15.0	5	12.5	χ^2= 0.105	0.745
Extended	34	85.0	35	87.5		

χ^2: **Chi square test** MC: **Monte Carlo**
t: Student t-test
p: p value for comparing between the studied groups

Table (2) the table represents study subjects' Vital signs. It clarifies that regarding the ***temperature*** immediately after intervention 85% of the study compared to only (45%) of the control group had 37.1 to 37.4 C. The difference between groups was statistically significant (p=0.001). The difference between the study group before and after the intervention was statistically significant (p=0.001), compared to the difference between the control group before and after the intervention it was not statistically significant (p=0.077). Regarding to, ***blood pressure*** immediately after intervention 72.5% of the study compared to only (10%) of the control group had 140/90 to 150/100. The difference between groups was statistically

significant (p=0.001). The difference between the study group before and after intervention was statistically significant (p=0.001), compared to the difference between the control group before and after intervention was not statistically significant (p=0.096).In relation to, pulse immediately after intervention 72.5% of the study compared to only (10%) of the control group had 85 to 90 b/m. The difference between groups was statistically significant (p=0.001). The difference between the study group before and after intervention was statistically significant (p=0.001), compared to the difference between the control group before and after the intervention was not statistically significant (p=0.102). Concerning, respiration immediately after intervention 77.5% of the study compared to only (10%) of the control group had 16 to 22 c/m. The difference between groups was statistically significant (p=0.001). The difference between the study group before and after intervention was statistically significant (p=0.001). On the other hand, the difference between the control group before and after intervention was not statistically significant (p=0.317).

Table (2):Number and percent distribution of the study subject according to their ante-natal clinical profile (Vital signs)

Ante-natal clinical profile (Vital signs)	Study (n = 40)				Control (n = 40)				$\chi^2(p_1)$	$\chi^2(p_2)$
	Before		After		Before		After			
	No.	%	No.	%	No.	%	No.	%		
Temperature										
36.5-37	28	70.0	6	15.0	30	75.0	22	55.0	0.251 (0.617)	14.066* (<0.001*)
37.1-37.4	12	30.0	34	85.0	10	25.0	18	45.0		
$^{McN}p_0$	<0.001*				0.077					
Bloodpressure										
>140/90-150/100	3	7.5	29	72.5	1	2.5	4	10.0		
>160/110-180/150	25	62.5	11	27.5	25	62.5	24	60.0	1.154 (^{MC}p=0.61)	35.768* (<0.001*)
>190/160-250/180	12	30.0	0	0.0	14	35.0	12	30.0		
$^{MH}p_0$	<0.001*				0.096					
Pulse										
85-90	3	7.5	29	72.5	2	5.0	4	10.0		
95-110	26	65.0	11	27.5	25	62.5	25	62.5	0.469 (^{MC}p=0.87)	35.384* (<0.001*)
<115	11	27.5	0	0.0	13	32.5	11	27.5		
$^{MH}p_0$	<0.001*				0.102					
Respiration										
16-22	10	25.0	31	77.5	3	7.5	4	10.0		
23-25	25	62.5	9	22.5	27	67.5	26	65.0	5.513 (0.064)	39.086* (<0.001*)
<26	5	12.5	0	0.0	10	25.0	10	25.0		
$^{MH}p_0$	<0.001*				0.317					

χ^2: **Chi square test** MC: **Monte Carlo**

McN: McNemar test **MH: Marginal Homogeneity Test**

p_1: p value for comparing between the studied groups in before

p_2: p value for comparing between the studied groups in after

p_0: p value for comparing between before and after in each group

*: Statistically significant at $p \leq 0.05$

Table (3): The table shows the percent distribution of the study subjects according to their level of anxiety before and after the intervention and shows that there was no difference in baseline anxiety between the two groups (p=0.71). ***Before intervention*** 87.5 % and 92.5% of the study and control groups respectively had experienced high anxiety. Meanwhile, none of each group had moderate anxiety. ***After intervention*** high anxiety decreased from 87.5% before intervention to 0.0% after intervention among the study group compared to 92.5% and 80.0% before and after intervention among the control group respectively. Additionally, it is observed that the subjects in the study group continued to show mild (12.5%) to moderate anxiety (75.0%) after the intervention. while the control group, has moderate and mild anxiety increased only from 0.0% before intervention to 7.5% after the intervention and only from 7.5% before intervention to 12.5% after the intervention respectively while the largest percentage remains to show a high level of anxiety (80%). The difference between the two groups was statistically significant regarding the levels of anxiety (p<0.001)

Table (3):Number and percent distribution of the study subject according to their level of anxiety before and after intervention

Anxiety	Study (n = 40)				Control (n = 40)				$\chi^2(p_1)$	$\chi^2(p_2)$
	Before		After		Before		After			
	No.	%	No.	%	No.	%	No.	%		
Mild anxiety from 0-21	5	12.5	30	75.0	3	7.5	5	12.5	0.556 (^{FE}p=0.71)	53.626* (<0.001*)
Moderate anxiety 22-35	0	0.0	10	25.0	0	0.0	3	7.5		
High anxiety more 36	37	87.5	0	0.0	37	92.5	32	80.0		
p_0	<0.001*				0.035*					

χ^2: **Chi square test** MC: **Monte Carlo**

p_1: p value for comparing between the studied groups in before

p_2: p value for comparing between the studied groups in after

p_0: p value for **Marginal Homogeneity Test** for comparing between before and after in each group

*: Statistically significant at $p \leq 0.05$

Table (4): the table portrays poor sleep experienced improved where 77.5%of the subjects in the study group experienced poor quality of sleep before the intervention and none of them continued to experience poor quality of sleep(0.0%) after the intervention. While among the control group 92.5% of the subjects experienced poor quality of sleep before the intervention versus 90.0% of them after the intervention. Furthermore, a remarkable increase in the percentage of subjects of the study group is observed in normal refreshing sleep where the percentage increased from 7.5% before the intervention to 75.0% after the intervention, compared to a marginal increase in the percentage of normal refreshing sleep in the control group, from 7.5% before intervention to 10.0% after the intervention. The table also shows that the increase in the percentage of normal refreshing sleep after the intervention in the study group was statistically significant (p<0.001). on the other hand, there is no statistically significant difference in the control group before and after the routine intervention (p=0.564).

Table (4): Number and percent distribution of the study subject according to their quality of sleep before and after intervention

Quality of sleep	Study (n = 40)				Control (n = 40)				$\chi^2(p_1)$	$\chi^2(p_2)$
	Before		After		Before		After			
	No.	%	No.	%	No.	%	No.	%		
Normal refreshing 0-2	3	7.5	30	75.0	3	7.5	4	10.0	6.681 (^{MC}p= 0.052)	65.882* (<0.001*)
Fair 3-9	6	15.0	10	25.0	0	0.0	0	0.0		
poor 10-14	31	77.5	0	0.0	37	92.5	36	90.0		
p_0	<0.001*				0.564					

χ^2: **Chi square test** MC: **Monte Carlo**
p_1: p value for comparing between the studied groups in before
p_2: p value for comparing between the studied groups in after
p_0: p value for **Marginal Homogeneity Test** for comparing between before and after in each group
*: Statistically significant at $p \leq 0.05$

Table (5): demonstrates the correlation between the mean scores of anxiety and quality of sleep of the studied subjects after intervention. The table shows that the relationship between anxiety and quality of sleep is a significant positive strong correlation (r =.798, p = .000).

Table (5): Correlation between score of anxiety and quality of sleep before and after intervention

Correlations

		Total score of sleep	Total score of anxiety
Total score of sleep	Pearson Correlation	1	.798**
	Sig. (2-tailed)		.000
	N	80	80
Total score of anxiety	Pearson Correlation	.798**	1
	Sig. (2-tailed)	.000	
	N	80	80

r: Pearson coefficient
*: Statistically significant at $p \leq 0.05$

Discussion

High elevated blood pressure in pregnancy can have devastating effects on both maternal and fetal health and is associated with increased risk for preeclampsia and psychological problems as anxiety and poor quality of sleep. Benson Relaxation technique can provide a decrease in the sympathetic nervous system, allowing the arteries to widen, is increasing the availability of oxygen and blood flow to the body tissues. Moreover, it can help in decreasing blood pressure, improving anxiety and quality of sleep [19].

In the present study, the effect of Benson relaxation therapy on anxiety and the quality of sleep among pre-eclamptic women was assessed using two tools namely; Beck Anxiety Inventory (BAI) and The Groningen Sleep Quality Scale (GSQ). The result of the current study revealed that there is no statistically significant difference between the two groups before intervention in relation to physiological parameters (temperature, pulse, respiration systolic and diastolic blood pressure). However, there was a high statistically significant difference after intervention between the two groups where the study group was significantly better than the control group after intervention. Similarly, **Hassani et al.** ***(2016)*** reported that application of Benson relaxation technique on the anxiety level of patients undergoing coronary angiography resulted in a highly statistically significant improvement in respiratory rate, heart rate, systolic and diastolic blood pressure after application of the intervention [20]. This also goes in line with the study of **Poorolajal et al.** ***(2017)*** who found that the application of Benson relaxation is a safe method, with no adverse effects on preoperative anxiety level and hemodynamic status of patients who were candidates for surgical procedures. The desirable effect of the Benson relaxation technique on physiological parameters and anxiety may be explained by its ability to reduce the sympathetic nervous system excitation that makes the fight or flight response and decreases the level of stress. So, simply relaxing for 15 to 20 minutes twice or thrice daily results in lowered levels of adrenaline, cortisol, blood pressure, heart rate, and respiratory rate, which enhance the immune function and balance the activity in the right and the left hemispheres of the brain resulting in better physiological parameters and less level of anxiety [21].

The present study also revealed that the study group showed no a high level of anxiety after the intervention, and only mild and moderate levels of anxiety were present reflecting improvement in anxiety level as compared to prior intervention state. On the other hand, the largest percentage of the control group continued to show high level of anxiety after routine hospital intervention. The remarkable improvement in the level of anxiety in the study group may be due to the improvement that the Benson relaxation techniques induce on the physiological parameters. This may, in turn, give the studied subjects a sense of control over their body and consequently, their minds leading to less anxiety and increased feeling of comfort. In the same line, Ibrahim et al (2019) reported that patients who received Benson relaxation had more decrease in hospital anxiety than others [22].

In the same line study in Iran by ***Mohammadi MM et al (2019)*** In which they found that the combination of Benson relaxation technique (BRT) and brief psycho-educational intervention

(BPI) can lead to a reduction in the negative psychological symptoms and multidimensional pain in the pregnant women. This intervention is recommended to be considered as part of a healthcare program in pregnant mothers [23]. Moreover, **Tahasbi et al, (2016**) reported that the use of the Benson relaxation technique significantly decreased anxiety in the intervention group [24]. Additionally, **Salmanzadeh A et al (2018)** reported that Benson relaxation alleviated anxiety before cesarean section in nulliparous women undergoing cesarean section. This may be explained by literature reporting that muscle relaxation decreases oxygen consumption, increases CO2 disposal, and decreases heartbeat and blood pressure, this in turn decreases the anxiety and mental pressures of the pregnant woman [25]. Such similarity among the results of the above mentioned studies can be attributed to what is elicited in the literature about the effect of relaxation to decrease anxiety through the body produce natural opiates called endorphin it can be released by any number of stimuli including laughter and feeling good [26].

On the opposite side, a study done ***by Kurniasari A et al (2016***) reported that the Benson relaxation techniques do not on anxiety scores of hemodialysis patients [27]. The existence of such an wkward between the results of the present study and the later dissertation may be due to difference of research designs and methodology between the two studies.

Regarding the quality of sleep, the result of the present study showed that the study group was significantly better than the control groups after intervention where p=0.001. Poor sleep experienced decreased from 77.5% before intervention to 0.0% after intervention among study groups compared to 92.5 % and 90.0% before and after intervention among the control group respectively. This result is consistent with the findings of ***Ranjkesh F et al (2019)*** who found significant improvements in the study group on quality of sleep after applying Benson's relaxation technique on a group of elderly [28] **.**Similarity, ***El Gilany A et al (2019)*** concluded that Benson's relaxation technique is an effective technique to reduce the level of anxiety and improve sleep quality in elderly patients undergoing hemodialysis [29]. More recently ***Harorani M et al (2020)*** reported that the Benson relaxation technique as a complementary method may improve sleep quality in cancer patients undergoing chemotherapy [30]. Furthermore, it was reported in the literature that Benson relaxation help to increase mental and physical performance, combat tiredness, decrease anxiety and improve sleep. [31].

Regarding the correlation between the level of anxiety and the quality of sleep of the studied subjects, the present study revealed that there is positive correlation indicating that lower scores on anxiety scale are correlated to lower scores on sleep scales. This may indicate that when anxiety levels improved, the quality of sleep also improved in the study group, the improvement in the quality of sleep reported in table 9 may be related to the Benson relaxation technique and to the decreased anxiety level. Similarly, ***Afshar M et al (2018)*** found that guided imagery intervention can significantly alleviate anxiety and improve sleep quality among hemodialysis patients. In the same line, the relaxation technique is one example of mind-body medicine that is becoming part of an integrative approach of care as it

improves sleep quality, increases emotional wellbeing, and decreases anxiety, stress and anger. However, the positive correlation between anxiety and quality of sleep may imply that when preeclamptic women had a low level of anxiety, they may still experience poor sleep quality probably due to the physical and physiological manifestation of the pregnancy or the preeclampsia and to anxiety. [32] There is literature supporting that the combination between the Benson relaxation technique and brief psycho-educational intervention (BPI) can lead to a reduction in the negative psychological symptoms in the pregnant women [33].

CONCLUSION

Based on the results of the current study, it can be concluded that: the Benson relaxation can be used as an effective intervention to decrease anxiety and improve the quality of sleep. Benson relaxation technique is a simple, with no reported side effects and high acceptance, so it should be available, whenever applicable to the re-eclamptic women.

RECOMMENDATIONS

1. Benson relaxation technique is recommended as an effective intervention for preeclamptic women and thus should be included in the nursing care plan of this group of pregnant women.
2. The combination of Benson relaxation technique (BRT) and brief psycho-educational intervention (BPI) can lead to a reduction in the negative psychological symptoms and multidimensional pain in the pregnant women.

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