

# The Impact of Nursing Intervention on Blood Pressure and Stress among perimenopausal Women

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## Abstract

The years proximate to menopause are accompanied by an increase in blood pressure and the prevalence of hypertension that may lead to complaints that attributed to menopause. High blood pressure is a potentially life-threatening condition that affects some menopausal women and is linked to heart attacks and strokes. This study aimed to assess the impact of nursing intervention on blood pressure and stress among perimenopausal women. Quasi-experimental research design was conducted to meet the aim of the study. The research was carried out at outpatient clinic of the University Hospital and Shebin El-kom Teaching Hospital in the Shebin El-kom District, Menoufia Governorate, Egypt. A purposive sample for a group of 100 perimenopausal women with stage I hypertension was chosen at random. Study group received a structured instruction and planned clinical supervision about relaxation techniques which include progressive muscle relaxation & guided imagery and walking exercise program as well nursing and medical routine care provided in the outpatient clinic, while the control group follow nursing and medical routine care provided in the outpatient clinic. The data gathering instruments were Instrument I: structured interview questionnaire. Instrument II: physiological measurements. Instrument III: Perceived stress scale. The main findings of the study were there is no statistically significant difference between a study and a control group for systolic and diastolic blood pressure mean at pretest while at posttest there is statistically significant decrease in a mean value of systolic and diastolic blood pressure for a study group than a control group. There is a highly statistically significant reduction for both stress level and the mean value for a study group than a control group at posttest and follow up following the nursing intervention. The study concluded that nursing intervention which includes progressive muscle relaxation & guided imagery and walking exercise program can improve their knowledge, decrease stress and blood pressure among premenopausal women.

**Keywords:** nursing intervention, blood pressure, stress, perimenopausal women.

## 1. Introduction:

The term perimenopause refers to the time prior to menopause (when endocrinological, biological, and clinical signs of impending menopause appear) as well as the first year following menopause. (Nanette et al., 2018). While the onset and duration of perimenopause differ greatly from woman to woman, the average age of menopause is 51 years. The phase between a woman's mid-40s and mid-50s is known as perimenopause. (El-khoudary, 2020).

According to El khoudary, (2020) Perimenopause may be also associated with vasomotor and genital symptoms as well as changes in bone metabolism. Lipid profile changes, obesity, hypertension, glucose intolerance, and diabetes mellitus may all become risk factors for cardiovascular disease.

In both the United States and Europe, vascular disease is the leading cause of death and morbidity in women, greatly than cancer. either in the United States or in Europe.

The causes for menopausal women's higher risk of hypertension are unknown. Several factors may be at play; for example, a loss of energy may result in weight gain, raising the risk of high blood pressure. Depression, which affects certain menopausal women, is another risk factor for hypertension. According to several researches, menopausal women consume more alcohol and smoke more cigarettes may be at risk (Sandhya, 2015). Other studies reported correlation between blood pressure and hot flashes and found increase in diastolic blood pressure during hot flashes (Elizabeth et al., 2016). The drop in oestrogen during menopause causes not just vasoconstriction but also changes in women's

lipid profiles, putting women who have gone through menopause at a higher risk of cardiovascular disease. (Valdes and Bajaj, 2020). Hormone replacement therapy (HRT) helps alleviate the menopausal symptoms but cannot be recommended for the prevention of cardiovascular disease. Cardiovascular events can be reduced by the management of risk factors. Particularly important is the control of hypertension, lipids and other factors contributing to the metabolic syndrome. (Abramson et al., 2018)

Changes in lifestyle around the time of menopause can lower the risk of heart disease and chronic illness later in life, as well as the cost of care. (Abramson et al., 2018)

Different relaxation techniques are used nowadays. Diaphragmatic breathing, meditation, imaging techniques, music therapy, massage therapy, progressive relaxation, hypnosis, autogenic training, and biofeedback are among the most frequent. They differ in terms of administration, and each has unique characteristics that set it apart from the others. (Ain, Hidayah, and said, 2018). They are economically attractive because they are inexpensive. (Maness, 2015).

The effect of progressive muscle relaxation on essential hypertension has been shown in the majority of studies; nevertheless, meta-analyses have shown that it has a modest to average effect. However, the effect of breathing control technique on chronic hypertension is more evident, and it has been shown to lower blood pressure in the majority of cases. (Ain, Hidayah and said, 2018 ) Regular physical exercise lowers blood pressure, according to the American and European hypertension guidelines. (Hassan, Hadad and El-Rrefaye, 2017) A recent meta-analysis found that people who followed a physical walking programme had significantly lower systolic and diastolic blood pressure. (Borjesson et al., 2016).

Nurses have an important role to play in health promotion for the menopausal women who suffer from hypertension. Lifestyle modification are the most important factors that nurses should give knowledge about it. It may be helpful to give her a list of resources that she can read at home. (Valdes and Bajaj, 2020).

## 1.1. Significance of the study

The women spend near one third of her life in menopausal and post-menopausal stage. Approximately one billion women will be between the ages of 40 and 60 years in the whole population by the year 2020. Menopause is known as the "transition of life," is characterized by a variety of physical, mental, and emotional changes. (Engida, Natnael, and Behanu, 2017). Hypertension is a major health issue in Egypt, with a prevalence of 26.3%. Women who have high blood pressure during menopause are more likely to have unfavorable cardiovascular consequences. (Hassan., Hadad, and El-Rrefaye., 2017).

Hypertension is one of the most major risk factors for developing cardiovascular disease in women. Cardiovascular disease is the main cause of death in women and the most important neglected public health issue in both developing and developed countries. (Nanette et al., 2018).

Physical inactivity is linked to a 2-fold increase in the risk of cardiovascular disease; physically active women have an approximately 50% lower risk than sedentary women. (Nanette et al., 2018). Controlling blood pressure and stress is important both before and after menopause, and this can be accomplished by focusing on walking exercise most days of the week and relaxation techniques. For this, the current research examined the impact of a nursing intervention on blood pressure and stress in perimenopausal women with hypertension.

## 1.2. Aim of the study:

The aim of this study was to determine the impact of nursing intervention on blood pressure and stress among perimenopausal.

### . Operational definition:

Nursing intervention means and instruction and planned clinical supervision of relaxation techniques such as progressive muscle relaxation and guided imagery, as well as walking exercise.

- 1.3. Research hypothesis: In an attempt to achieve the study's aim, the following research hypothesis has been developed:
1. Mean knowledge score about hypertension, walking exercise, relaxation techniques will be higher among a study group after nursing intervention than a control group.
  2. Blood pressure will be lower after applying nursing intervention among a study group than a control group.
  3. The stress level will be reduced after nursing intervention among a study group than a control group.

## 2. Methodology:

**2.1. Research design:** A quasi experimental research design was used to achieve the study aim.

**2.2. Research setting:** The study was carried out in a medical outpatient clinic at the University Hospital and the Shebin El-kom teaching hospital in the Shebin El-kom District of Menoufia Governorate, Egypt..

### 2.3. Subjects:

A purposive sample of 100 perimenopausal women with stage I hypertension was chosen at random. The study group received structured instruction and planned clinical supervision about relaxation techniques such as progressive muscle relaxation and guided imagery, as well as a walking exercise programme and nursing and medical routine care in the outpatient clinic. While, the control group follows nursing and medical routine care.

**Sample and sampling technique:** The sample size consists of 100 perimenopausal women at stage I hypertension systolic blood pressure between (140 – 159 mmHg), diastolic blood pressure between (90-99 mmHg), and actually take antihypertensive medications regularly. The sampling technique used was non probability, purposive sampling technique.

**Sampling criteria:** The samples were selected on the following criteria:

### The inclusion criteria:

- perimenopause women at stage I hypertension, systolic BP (140 – 159) mmHg and diastolic BP (90-99) mmHg.
- The women have menopausal symptoms and in climacteric phase.

### The exclusion criteria:

- Women who had any musculoskeletal problem those interfere with walking.
- Women who had any chronic diseases such as, heart disease, or renal disease.
- Women who take hormonal replacement therapy.

### Variables:

The independent variable was nursing interventions while the dependent variable was blood pressure and stress.

### 2.5. Instruments of the study:

The researchers used three instruments based on a review of the related literature, which were as follows:

#### Instrument I: structured Interview questionnaire:

It was developed by the researchers after reviewing of the related literature. It was used to assess patient's knowledge about menopause, hypertension and comprised of two parts.

**Part I:** Women sociodemographic data: It included information about patient's age, level of education, occupation, marital status and residence.

**Part II:** Knowledge assessment sheet: It was developed by researchers after reviewing the related literature and included thirteen questions to assess women knowledge about hypertension, walking exercise, relaxation techniques. Scoring system described as the following; each question scored from zero to two as zero indicated incorrect answer, one indicated correct but incomplete answer, and two indicated correct and complete answer. The total knowledge score formed by the sum of all questions from (zero to twenty six) and

assigned into the knowledge level as the following; less the 50% (less than 13 degree) referred to unsatisfactory knowledge, from 50% - 75% (13 - 19.5) referred to satisfactory knowledge, and more than 75% (more than 19.5 - 26) referred to good knowledge.

#### **Instrument II: Physiological measurement:**

It was used to determine the baseline data before initiating nursing intervention related to blood pressure and progress produced after application of nursing intervention.

**Instrument III: Perceived Stress Scale:** It was developed by Chaaya et al., (2010) and was utilized by the researchers to assess the degree to which women perceive their lives as stressful. Subjects indicate how often they have found their lives unpredictable, uncontrollable, and overloaded in the last month. It consists of 10 items, each item is rated on a 5-point scale ranging from never (0), almost never (1), sometimes (2), fairly often (3) and very often (4), in this scale there were reverse scores for questions 4,5,7 and 8, change the score like this 0=4, 1=3, 2=2, 3=1 and 4=0 and the ratings are summed across all 10 items. Scores ranging from 0 to 13 are considered low stress, 14 to 26 are considered moderate stress, and 27-40 are considered high perceived stress..

## **II. Method**

**Written approval:** Permission to carry out the study was taken from responsible authorities after explanation of the purpose of the study.

**Protection of human rights:** At the initial interview each woman was informed about the purpose and benefits of the study and informed that their participation is voluntary. Also confidentiality and anonymity of the participants were assured. Finally formal consent for participants has been obtained.

**Preparatory phase:** In this phase the researchers started to review recent, current, national and international related literature. Also, journals, magazines, text books, internet, and theoretical knowledge, of the various aspects concerning the study topics

were prepared. Also, the researchers attended two weeks training sessions by a physiotherapist in the physiotherapy department at university hospital, to learn how to apply relaxation techniques progressive muscle relaxation, guided imagery

**Instrument development:** Instruments used in the research were developed by the researchers after extensive review of the relevant literature and were tested for content validity by 3 experts in the medical-surgical nursing departments to ensure its' relevance, clarity and completeness then the required modification was done accordingly.

**Reliability:** A test-retest method and a person correlation coefficient formula were utilized and the interval between every test was 2 weeks; it was 0.89 for the instrument I part II and the reliability was tested by Chaaya et al., (2010) and was 0.74 for instrument III.

**Pilot study:** A pilot study was conducted on 10% of study sample (10) patients to evaluate the developed instruments and for clarity and applicability then necessary modification was done.

#### **Data collection:**

- The collection of data has been extended from January to the end of June 2020.
- The data were collected from the previous settings. At first the purpose of the study was explained and their consent to participate was obtained. The questionnaire was filled in while conducting interviews from subjects. Participants required approximately 15 minutes to complete data collection form, then • In order to follow up with the participants, the researcher recorded their phone number and address.

#### **Procedure:**

- Before participating in the study, each woman signed an informed consent form.
- The study's purpose and nature of the study were explained to all of the women. The participants were divided into two equal groups at random: Group A (study)

consisted of fifty women who were given structured instruction and planned clinical supervision on relaxation techniques such as progressive muscle relaxation, guided imagery and walking exercise program as well nursing and medical routine care provided in the outpatient clinic. Group B (control) consisted of fifty women who followed nursing and medical routine care provided in the outpatient

- Evaluative procedures Before starting the study pre-test, each woman was subjected to careful history taking, including personal history (name, age, address, telephone number, occupation, marital state).

### Measurement procedures

- Blood pressure measurement: The procedure was carefully and clearly explained to each woman, to actively motivate her to perform maximally. The women were advised to avoid salty and spicy foods in addition to avoid drinking tea or coffee before measurement sessions.
- Blood pressure was measured in millimeter of mercury by a sphygmomanometer three times at the beginning (pretest), after one month (posttest), and at the end of the program after three month (follow up), and then the mean of summation of three reading was recorded.

### Training procedures

#### 1- Relaxation technique

- Prior to the study, all women were fully illustrated and explained the protocol of the study, and they signed a written approved consent form..
- Duration of the relaxation session: 20 min.
- Frequency: If possible every day or at least three times per week for 3 months.
- Position of the woman: - The woman is in a half-lying position, with her back supported and her arms relaxed at her sides.
- Techniques used: The woman was asked to pay attention to her breathing, noticing whether it was shallow or short and quick. Then, start picturing an object in her mind. This object should be straightforward and pleasurable for her. It

could be the sky, the moon, etc. Some people prefer a specific type of sound, such as music. - Whichever they choose, they should try to visualise the object, word, or something that represents the sound. The woman was then instructed to close her eyes and take a deep breath from her nose, filling her abdomen like a balloon fully and slowly to the count of four until her abdomen was full, then exhale the air from her mouth, and then contract her abdomen in. If there was an interruption, she was asked to bring him.

- This procedure was repeated four times: deep breaths to a count of 4 and expired at a count of 4. Then, the woman was asked to take a four-count deep breath, hold it to a count of 4, and expire at - This procedure was repeated four times: deep breaths to a count of four, followed by an exhalation at a count of four. The woman was then instructed to take a four-count deep breath, hold it to a count of four, and exhale at a count of four.
- She was asked to imagine herself in a more relaxed environment. A summer beach or a river where she could sit and enjoy the scenery while listening to the soothing sound of running water.
- The woman was then asked to tell herself affirmations like, "I am calm and collected." A combination of breathing exercises and transcendental meditation (TM) were used in this technique.

**2- Walking exercise:** women asked to walk from 20-30 minute daily for three months.

- The authors confirmed the continuity of implementing the nursing intervention by the subjects through the patients' visits to the outpatient clinic for follow-up and contacting them at home by phone.

### Statistical analysis:

Data were collected, tabulated, and statistically analysed on an IBM personal computer running the Statistical Package for Social Science (SPSS) version 22 and utilising the following statistics.

**1. Descriptive statistics:** quantitative data were presented in the form of mean ( $\bar{x}$ ), standard deviation (SD), and qualitative data in the form of numbers and percentages.

## 2. Analytical statistics:

The tests used of significance included chi-square test ( $\chi^2$ ), student t-test, Mann-Whitney test, repeated-Measures (ANOVA) and Pearson's correlation coefficient (r). p-value > 0.05 was considered not statistically significant, a p-value < 0.05 was considered statistically significant, and a p-value < 0.001 was considered highly statistically significant.

## 3. Results:

**Table 1** illustrates that about two thirds of the study group was married (70%) and more than half of the control group was married (64%) with the mean age  $48.74 \pm 3.25$  and  $47.80 \pm 2.73$  for study and control groups respectively. In relation to level of educational about one quarter of a study and a control group 24% and 20% were illiterate while about one third of the study and group was read and write (30% and 36%) for the study and the control group respectively, also 26% and 16% were secondary education and 20% and 28% were higher education for the study and the control group respectively. Regarding occupation more than half of the studied groups 52% and 54% were housewives and more than half of them have insufficient income 50% and 56% and coming from rural area 62% and 58% for the study and the control groups respectively. There was not statistically significance deference between study and control groups regarding to personal characteristics.

**Table 2** describes that more than two thirds (78%) of a study and a control group patients had unsatisfactory knowledge, the difference between a study and a control group is not statistically significant at pretest as p-value > 0.05. While at posttest (38% and 48%) of a study group patients have good and satisfactory knowledge in contrast to (76%) of a control group patients have unsatisfactory knowledge, the difference between a study and a control group for knowledge level is highly statistically significant at posttest as p-value < 0.001 for knowledge level and highly. However at follow up (22% and 40%) of a study group patients have good and satisfactory knowledge in contrast to (76%) of a control group patients have unsatisfactory knowledge, the difference between a study and a control group for knowledge level is a statistically significant at follow up as p-value < 0.05.

**Table 3** clarifies that there is no statistically significant difference between a study and a control group for systolic and diastolic blood pressure mean at pretest as p-value > 0.05, while at posttest there is statistically significant decrease in mean value of systolic and diastolic blood pressure for a study group than a control group as p-value < 0.05 and a highly statistically significant decrease in the mean value of a systolic and a diastolic blood pressure for a study group than a control group as p-value < 0.001. This means that the systolic and the diastolic blood pressure reduced after application of the nursing intervention.

**Figure 1** shows that that there is a statistically significant decrease of the mean value of a systolic and a diastolic blood pressure of the study group at posttest and follow up than pretest as p value < 0.05.

**Table 4** reveals that there is a highly statistically significant reduction for both stress level and the mean value for a study group than a control group at posttest and follow up following the nursing intervention as p-value < 0.001.

**Figure 2** indicates that that there is a statistically significant reduction of the mean value of a stress score of the study group at posttest and follow up than pretest as p value < 0.05.

**Table 5** clarifies the correlation between knowledge and blood pressure for a study group at pretest, posttest and follow up. It represents that there is a statistically significant negative correlation between knowledge and blood pressure (systole and diastole) at posttest as p value < 0.05. Also there is a highly statistical significant negative correlation between knowledge and systolic blood pressure at follow up as p-value < 0.001 and a statistically significant negative correlation between knowledge and diastolic blood pressure at follow up as p value = 0.001

**Table 6** describes the correlation between knowledge and stress for a study group at pretest, posttest and follow up. It shows that there is a statistically significant negative correlation between knowledge and stress at posttest as p-value < 0.05 and a highly statistical significant negative correlation between knowledge score and stress score at follow up as p-value < 0.001

**Table 1:** Personal characteristics of perimenopausal women of a study and a control groups

| Women characteristics                    | Study (n=50)     |    | Control (n=50)   |    | $\chi^2$<br>p value           |
|--|------------------|----|------------------|----|-------------------------------|
|  | No.              | %  | No.              | %  |                               |
| <b>Age (<math>\bar{X} \pm SD</math>)</b> | 48.74 $\pm$ 3.25 |    | 47.80 $\pm$ 2.73 |    | t-test= 1.57<br>p value= 0.12 |
| <b>Marital status</b>                    |                  |    |                  |    |                               |
| - Married                                | 35               | 70 | 32               | 64 | 0.41                          |
| - Widow                                  | 15               | 30 | 18               | 36 | 0.52                          |
| <b>Educational Level</b>                 |                  |    |                  |    |                               |
| - Illiterate                             | 12               | 24 | 10               | 20 | 2.31                          |
| - Read and write                         | 15               | 30 | 18               | 36 | 0.51                          |
| - Secondary education                    | 13               | 26 | 8                | 16 |                               |
| - Higher education                       | 10               | 20 | 14               | 28 |                               |
| <b>Place of residence</b>                |                  |    |                  |    |                               |
| - Rural                                  | 31               | 62 | 29               | 58 | 0.17                          |
| - Urban                                  | 19               | 38 | 21               | 42 | 0.68                          |
| <b>Occupation</b>                        |                  |    |                  |    |                               |
| - Housewives                             | 26               | 52 | 27               | 54 | 0.36                          |
| - Employee                               | 24               | 48 | 23               | 46 | 0.55                          |
| <b>Family income</b>                     |                  |    |                  |    |                               |
| - Sufficient                             | 35               | 70 | 37               | 74 | 0.20                          |
| - Insufficient                           | 15               | 30 | 13               | 26 | 0.66                          |

**Table (2):** knowledge score among a study and a control group at different times of assessment (pretest, posttest and follow up).

| Knowledge level  | Study group (n=50) |    | Control group (n=50) |    | $\chi^2$ | p value |
|--|--------------------|----|----------------------|----|----------|---------|
|  | No                 | %  | No                   | %  |          |         |
| <b>Knowledge level pretest</b>                                       |                    |    |                      |    |          |         |
| - Good   | 2                  | 4  | 4                    | 8  | 0.92     | 0.63    |
| - Satisfactory   | 9                  | 18 | 7                    | 14 |          |         |
| - Unsatisfactory   | 39                 | 78 | 39                   | 78 |          |         |
| <b>Total knowledge score pretest (<math>\bar{X} \pm SD</math>)</b>   | 5.78 $\pm$ 5.57    |    | 5.52 $\pm$ 5.80      |    | *0.23    | 0.82    |
| <b>Knowledge level posttest</b>                                      |                    |    |                      |    |          |         |
| - Good   | 19                 | 38 | 4                    | 8  | 39.14    | < 0.001 |
| - Satisfactory   | 24                 | 48 | 8                    | 16 |          |         |
| - Unsatisfactory   | 7                  | 14 | 38                   | 76 |          |         |
| <b>Total knowledge score posttest (<math>\bar{X} \pm SD</math>)</b>  | 17.06 $\pm$ 4.22   |    | 5.68 $\pm$ 1.92      |    | 11.24    | < 0.001 |
| <b>Knowledge level follow up</b>                                     |                    |    |                      |    |          |         |
| - Good   | 11                 | 22 | 4                    | 8  | 14.74    | 0.001   |
| - Satisfactory   | 20                 | 40 | 8                    | 16 |          |         |
| - Unsatisfactory   | 19                 | 38 | 38                   | 76 |          |         |
| <b>Total knowledge score follow up (<math>\bar{X} \pm SD</math>)</b> | 13.50 $\pm$ 5.27   |    | 5.68 $\pm$ 5.92      |    | *6.98    | < 0.001 |

\* Mann-Whitney test

Table (3): Blood pressure mean among a study and a control group at different times of assessment (pretest, posttest and follow up).

| Blood pressure measurement      | Study group (n=50)<br>( $\bar{X} \pm SD$ ) | Control group (n=50)<br>( $\bar{X} \pm SD$ ) | t-test | p value |
|---------------------------------|--|--|--------|---------|
| <b>Blood Pressure pretest</b>   |  |  |        |         |
| Systolic blood pressure         | 136.50±5.24                                | 137.06±4.51                                  | 0.70   | 0.49    |
| Diastolic blood pressure        | 90.50±2.53                                 | 90.10±4.34                                   | 0.56   | 0.58    |
| <b>Blood Pressure posttest</b>  |  |  |        |         |
| Systolic blood pressure         | 128.20±4.82                                | 130.30±4.33                                  | 2.29   | 0.024   |
| Diastolic blood pressure        | 86.30±4.61                                 | 88.10±3.76                                   | 2.14   | 0.035   |
| <b>Blood Pressure follow up</b> |  |  |        |         |
| Systolic blood pressure         | 121.50±4.97                                | 127.90±5.35                                  | 6.19   | < 0.001 |
| Diastolic blood pressure        | 81.20±3.85                                 | 85.50±5.74                                   | 4.40   | < 0.001 |

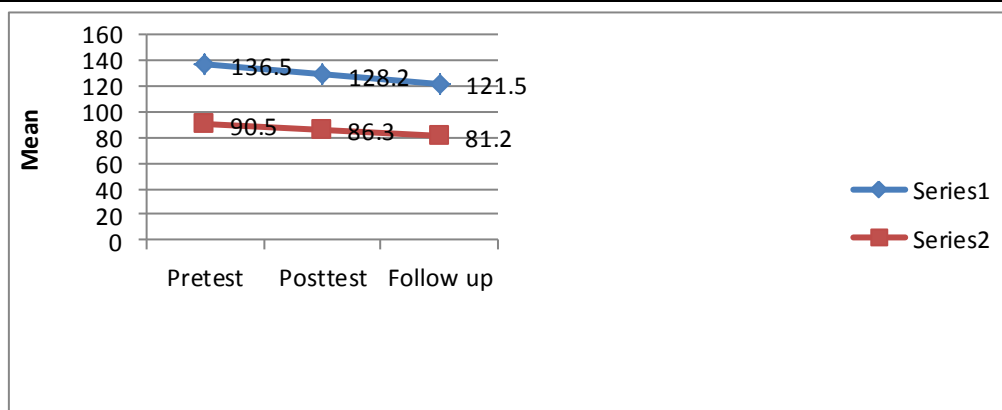


Figure (1): Mean value of systolic and diastolic blood pressure for a study group at pretest, posttest and follow up

Table (4): Stress level among a study and a control group at different times of assessment (pretest, posttest and follow up).

| stress levels   | Study group (n=50) |    | Control group (n=50) |    | $\chi^2$                            | p value |
|---|--------------------|----|----------------------|----|-------------------------------------|---------|
|   | No                 | %  | No                   | %  |                                     |         |
| <b>Pretest stress level:</b>                                      |                    |    |                      |    |                                     |         |
| - Moderate stress   | 19                 | 38 | 16                   | 32 | 0.40                                | 0.53    |
| - High stress   | 31                 | 62 | 34                   | 68 |                                     |         |
| <b>Total stress score pre (<math>\bar{X} \pm SD</math>)</b>       | 28.10±2.83         |    | 28.88±2.95           |    | t-test = 1.35<br>p-value = 0.18     |         |
| <b>Posttest stress level:</b>                                     |                    |    |                      |    |                                     |         |
| - Low stress  | 10                 | 20 | 0                    | 0  | 20.97                               | < 0.001 |
| - Moderate stress   | 27                 | 54 | 17                   | 34 |                                     |         |
| - High stress   | 13                 | 26 | 33                   | 66 |                                     |         |
| <b>Total stress score post (<math>\bar{X} \pm SD</math>)</b>      | 20.70±5.90         |    | 28.24±2.79           |    | t-test = 8.17<br>p-value = < 0.001  |         |
| <b>Follow up stress level:</b>                                    |                    |    |                      |    |                                     |         |
| - Low stress  | 24                 | 48 | 0                    | 0  | 35.01                               | < 0.001 |
| - Moderate stress   | 16                 | 32 | 19                   | 38 |                                     |         |
| - High stress   | 10                 | 20 | 31                   | 62 |                                     |         |
| <b>Total stress score follow up (<math>\bar{X} \pm SD</math>)</b> | 15.68±2.73         |    | 28.10±2.83           |    | t-test = 11.27<br>p-value = < 0.001 |         |



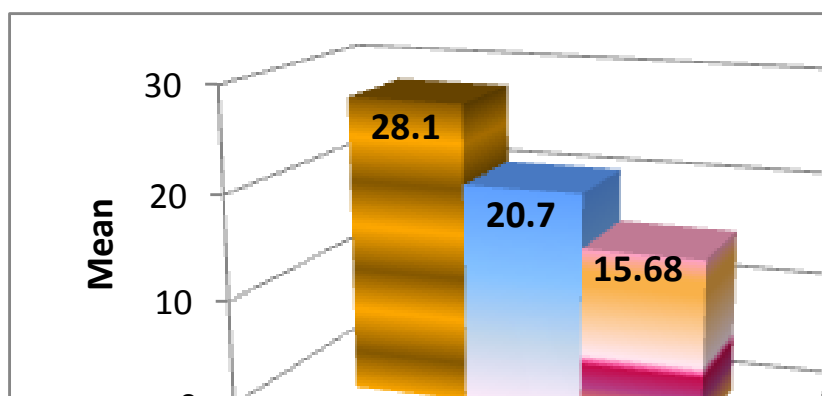


Figure (2): Mean value of stress for a study group at pretest, posttest and follow up

Table (5) correlation between knowledge and blood pressure for a study group at pretest, posttest and follow up

| Blood pressure measurement      | Knowledge scores of a study group (n=50) |         |
|---------------------------------|--|---------|
|                                 | R  | P value |
| <b>Blood Pressure pretest</b>   |  |         |
| Systolic blood pressure         | - 0.260                                  | 0.068   |
| Diastolic blood pressure        | - 0.232                                  | 0.105   |
| <b>Blood Pressure posttest</b>  |  |         |
| Systolic blood pressure         | - 0.363                                  | 0.010   |
| Diastolic blood pressure        | - 0.291                                  | 0.040   |
| <b>Blood Pressure follow up</b> |  |         |
| Systolic blood pressure         | - 0.512                                  | 0.000   |
| Diastolic blood pressure        | - 0.452                                  | 0.001   |

Table (6) correlation between knowledge and stress for a study group at pretest, posttest and follow up

| Stress                        | Knowledge scores of a study group (n=50) |         |
|-------------------------------|--|---------|
|                               | R  | P value |
| <b>Stress score pretest</b>   | - 0.278                                  | 0.051   |
| <b>Stress score posttest</b>  | - 0.345                                  | 0.014   |
| <b>stress score follow up</b> | - 0.587                                  | < 0.001 |

#### 4-Discussion

Menopause is a important innovative in the generative being of females, and hormonal alterations at menopause generate a gathering of essential and practical alterations so deficiency of physical actions, inadequate nutritional applies, and poor anxiety release aggravate the concerns of hormonal alterations and increase blood pressure.

Concerning to sociodemographic characteristics the present study found that about two thirds of the learning group was married and more than half of the control group

was married and the mean age was forty seven to forty eight years for a study and a regulator groups respectively.

In relative to level of educational about one quarter of a study and a control group were illiterate while about one third of the learning and regulator group was read and write for the study and the switch group, one quarter for the study and the control group were higher education . These results were in the agreement with Arinkan and Gunacti, (2020) that assessed the factors influencing age at natural menopause. The results showed that most menopausal women were at forty seven years. Furthermore Ahmad and Oparil, (2017) found

that the prevalence of hypertension in women and men by age group was thirty percent was from forty five to fifty four . Moreover in my point of view this agrees with that the menopause is a natural part of aging that usually occurs between forty five and fifty five years of age.

Likewise Luqi, et al., (2018) who studied the relations of the ages at menarche and menopause with blood pressure among middle-aged and elder Chinese females. They presented that participants were on average, aged fifty eight years. Greatest of the females were marital and alive with their husbands. A great percentage of ladies was illiterate, and a slight had a high education or above education. Smoking and drinking occurrence rates were low. The participants were on average, the mean years at menarche and menopause were sixteen and forty eight year.

Regarding to knowledge score among a education and a regulator group, the present study showed that extra than two thirds of a education and regulator group patients had unsatisfactory knowledge and not statistically significant alteration between a education and a regulator group at pretest. However at posttest less than half of education group patients have satisfactory knowledge in contrast the most of control group patients have unsatisfactory knowledge and greatly statistically significant change between a education and a regulator group for information level at posttest and follow up. In opposed to the Alshorgan et al., (2020) who assessed the information and alertness to menopause and hormone treatment among premenopausal females, they found that further than half of applicants were well-informed about numerous phases of menopause. Teaching to college or further was meaningfully and clearly related with information about menopause. The greatest of applicants did not recognize the roles, welfares, and dangers of management of hormonal treatment. There was a similar spreading for applicants' positive and negative attitudes to menopause.

These changes in our results related to the majority of sample were illiterate and low education. So they had unsatisfactory knowledge before intervention. At the same

line the Herberta et al., (2020) who study Australian females' considerate of menopause and its significances. They found shortage of information of the long-term significances about, despite the efficiency and security of management hormonal therapy, the total attitude to still negative.

Concerning to blood pressure measurement the present study found that no statistically significant alteration among a education and regulator groups for systolic and diastolic blood pressure mean at pretest but the systolic and the diastolic blood pressure reduced after application of the nursing intervention. These results agreement with Thomas Beaney et al., (2019). They study the measurement a practical international showing campaign to increase alertness of blood pressure by the worldwide civilization of hypertension. That found the proportion of screeners with hypertension decreased on subsequent readings and change in hypertension incidence based on the first and third interpretation. The lowermost occurrence of hypertension was established by the mean of the second and third interpretations after intervention.

Likewise the Afsar Omidi et al., ( 2017) who measurement the influence of teaching self-care performances on the hypertension in postmenopausal females, that presented that the systolic blood pressure and diastolic blood pressure of knowingly reduced afterward the interference. However systolic and diastolic blood pressure dignified before and after the interference in the regulator group, didn't appearance important alteration. These methods had effected results between study group during our research because most of women had a desire to carry out all intervention to support them in decreasing the blood pressure and other factor that increase hypertension and stress.

Regarding to stress among menopausal women the current research showing that there was a highly statistically important reduction for both stress level and the mean value for a study group than a control group at posttest and follow up following the nursing intervention. The same result reached it the Jayashri.G. Itti et al., (2020) who study coping strategies in

menopause women, they showed that greatest interferences for menopause females have fixated on instructive interference, exercise, well diet, well performance and yoga, so the wellbeing teaching interference plan is one of the another approaches for successful females' managing with menopause signs. Furthermore Parisa parsa et al., (2017) directed research on influence of group counseling on QOL between postmenopausal females. The current results advised that referring and preparation may progress QOL in menopause dated. As the essential for menopausal attention, it is suggested that accessing approaches are used in wellbeing carefulness centers as a repetitive attention for menopausal females. Similar to Shoberi et al., (2017) who directed a research on the influence of teaching program on QOL in menopausal female. The research showed that there was a significant change in the mean of QOL marks among the two groups subsequently the intervention and three months after the interference in aspect of vasomotor, psychosocial, sexual and physical. These results in our research showed that the nursing intervention about stress factors among premenopausal women was effective and proper results, especially the menopause women is associated with many physiological, behavioral, and psychosocial changes that can predisposing to disease and stress in women .

Regarding to correlation between knowledge and blood pressure for a study group at pretest, posttest and follow up the present research represented that there is a statistically significant negative correlation among knowledge and blood pressure (systole & diastole) at posttest and follow up. This similar to PrasantaK.Borah et al., (2018) who assessed knowledge, teaching and announcement module to decrease nutritional salt consumption and blood pressure between tea garden employees . The study showed that attentiveness about danger of hypertension related with great salt consumption and could decrease nutritional salt consumption to decrease blood pressure. at the same line Katarzyna Doroszewska et al., (2019) who assessed blood pressure in postmenopausal females with a history of polycystic ovary syndrome, they establish peoples should be carefully selected for hypertensive syndromes

and teaching about the routine adaptations that could avoid hypertension in life so this results that our study was very important for this category and the health knowledge is very important to decrease hypertension and complications.

Furthermore the present study found that It shows that there is a statistically significant negative association among knowledge and stress at posttest and a highly statistical significant negative correlation between knowledge score and stress score at follow up. Heidari et al., (2017) supported these results . they found significant correlation between increased stress, anxiety and depression among menopause women, it is essential to dedicate extra careful consideration to psychological health problems of females' and have suitable interferences to decrease anxiety. Also Megan Arnot et al., (2021) who study the association among social care, stressful actions, and menopause signs. He found that stress. Experience and knowledge of a stressful occurrence, however not amount of social care, was included in the best appropriate model; with the grade to which the female was distressed by the life stressor having the main effect on menopause signs. Here, females who assumed they were currently upset by a stressful occurrence knowledgeable extra than females who had knowledgeable no life stressor. Hildreth K., et al., (2018) added that Vascular problems across the phases of menopause was connected with more incidence and sternness of menopausal signs, and decrease QOL. All results confirm that the education and nursing information are very important to premenopausal women that helped them to adapt with stress and blood pressure changes.

## 5-Conclusions:

The study concluded that nursing intervention which include progressive muscle relaxation & guided imagery and walking exercise program can improve their knowledge, decrease stress and blood pressure among premenopausal women.

## 6-Recommendations for practice and research

- Nursing intervention and education among premenopausal women should be redirected a portion of repetitive nursing care achieved for all women before menopause.
- Apply updated protocol of different methods of nursing intervention that help menopausal women to control stress, hypertension, physiological and psychological changes before menopause through booklet or different methods of education.
- Repetition of the study with great possibility sample to license more generation of the education outcomes.

## 7- References.

- Afsar Omid, et al., ( 2017).** the effect of education self-care behaviors on the hypertension in postmenopausal women, *Avicenna J Nurs Midwifery Care*, 25(4): 121-130.
- Ahmad A. and Oparil S. (2017).** Hypertension in Women, *Hypertension in Women*, 70(1).
- Alshogran F. Mahmoud M. Alkhatatbeh A. (2020).** Knowledge and awareness toward menopause and hormone therapy among premenopausal women in Jordan, 24(2): 171-178
- Arinkan S. and Gunacti M. (2020).** Factors influencing age at natural menopause, First published: 21 December 2020, <https://doi.org/10.1111/jog.14614>.
- Beth L. Abramson, Kajenny, MD; Leslie L. Davis, NP, PhD, FACC; Biljana Parapid, MD (2018).** Women and Hypertension: Guideline for Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. American College of Cardiology.
- Borjesson M., Onerup L., Lundqvist S, Dahlof B. (2016).** Physical activity and exercise lower blood pressure in individuals with hypertension, *British Journal of sport*. 50 (6):356-361.
- Chaaya M , Osman H, Naassan G, Mahfoud Z. (2010).** Validation of the Arabic version of the Cohen Perceived Stress Scale (PSS-10) among pregnant and postpartum women, December 2010, *BMC Psychiatry*, 10(1):111.
- Elizabeth A., Jackson Md., Samar R., Elkhoudary PHD., Rebecca C., and Thurston. (2016).** Hot Flashes Frequency And Blood Pressure: Data From The Study Of Woman’s Health Across The Nation, *journal of Women’s Health*, 25 (12): 1204-1209
- El-khoudary S. (2020).** Menopause Transition and Cardiovascular Disease Risk: Implications for Timing of Early Prevention: A Scientific Statement from the American Heart Association, *Circulation*, 142:506-532
- Engida Y., Natnael E., Behanu D. (2017).** prevalence and severity of menopause symptoms among perimenopausal and postmenopausal women aged 30- 49 years, *woman's health* 17,124 <http://doi.org/10.1186/s12905-017-0484>
- Hassan M.,Hadad K., El-Rrefaye G. (2017).** the effect of relaxation techniques on hypertension secondary to menopause, *The Egyptian journal of internal medicine*, 29 (2): 59-63.
- Heidaril M., et al., (2017).** Sexual Self-concept and Its Relationship to Depression, Stress and Anxiety in Postmenopausal Women, Accepted: December 28, 2016, *Journal of Menopausal Medicine* .
- Herbert R. J. Belloircid K. Young H. Brown J. Y. Coles S. Davis (2020).** Australian women’s understanding of menopause and its consequences: a qualitative study, 23(6): 622-628.
- Hildreth K., et al., (2018).** Vascular dysfunction across the stages of the menopause transition is associated with menopausal symptoms and quality of life, *Menopause*. 25(9): 1011–1019.

- Jayashri.G. Itti, et al., (2020).** coping strategies in menopause women, *Development Journal*, 11 (937).
- Katarzyna Doroszevska, et al., (2019).** Blood pressure in postmenopausal women with a history of polycystic ovary syndrome, *Prz Menopauzalny*. 18(2): 94–98.
- Luqi S. et al., (2019).** Associations of the ages at menarche and menopause with blood pressure and hypertension among middle-aged and older Chinese women  
Received: 21 June 2018/ Revised: 11 October 2018 / Accepted: 15 October 2018 / Published online: 28 February 2019.
- Maness (2015).** Relaxation Technique, *Am Fam Physician*. 92(12):1058-64.
- Megan Arnot et al., (2020).** The relationship between social support, stressful events, and menopause symptoms, Published: January 27, 2021 available at: <https://doi.org/10.1371/journal.pone.0245444>.
- Nanette K, wenger M., karl J, and pepine M. (2018).** Hypertension across a woman's life cycle, *Journal of the American college of cardiology*, Volume 71, Issue 16 ,pages 1797-1813.
- Norelli SK.,LongA., and Krepps JM. (2020).** Relaxation technique, Statpearls [Internet] Treasure Island (FL) Statpearls publishing; available at <http://creativecommons.org/licenses/by/4.0>.
- Parsa P., Tabesh R., Farzaneh S.,Karami M. (2017).** Effect of Group Counseling on Quality of Life among Post menopausal Women in Hamadan, Iran. *Journal of Menopausal Medicine*, 23(1): 49- 55.
- PrasantaK.Borah, et al., (2018).** An information, education and communication module to reducedietary salt intake and blood pressure among tea garden workers of Assam, *Indian Heart Journal*, 70, 252–258.
- Sandhya M. (2015).** is there a connection between menopause and high blood pressure? available at <http://www.Myoclonic.org/expert/biographies>.
- Shoeiri F., Jenabi E., Khatiban M., Hazavehei SMM., Roshaneii., G. (2017).** The Effect of Educational Program on Quality of Life among Menopausal Women: A Clinical Trial. *J Menopausal Med*, 23(2): 91-95.
- Thomas Beaney et al., (2019).** a pragmatic global screening campaign to raise awareness of blood pressure by the International Society of Hypertension, *European Heart Journal*, Volume 40(25), 2006–2017.
- Valdes A.,Bajaj T. (2020).** statpearls [Internet]. Statpearls publishing;Treasure Island(FL)Estrogen therapy. [Pubmed].