Effect of Progressive Muscle Relaxation technique on postpartum afterpains intensity among multiparous women

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Abstract

Background: *Afterpains had been documented as a major concern for women in the postpartum period. However, its management is a relatively neglected area of clinical research. As a result, evidence to support interventions to alleviate it is sparse. Despite the effectiveness of pharmacological approaches carried out to relieve afterpains, they may cause deleterious effect on the mother and child's health.* *Objective:* *To determine the effect of progressive muscle relaxation technique on postpartum afterpains intensity among multiparous women.* *Setting:* *The study was carried out at the postnatal unit in El-Shatby Maternity University Hospital affiliated to Alexandria University.* *Subjects:* *A convenient sample of 100 postnatal women.* *Tools:* *three tools were used. Basic data structured interview schedule, which included demographic characteristics, reproductive history & clinical assessment sheet; Short-form McGill Pain Questionnaire* *(SF-MPQ),* *and A modified version of Chamber Price Pain Rating Scale* *(CPPRS).* *Results:* *The study showed* ***highly statistically significant between them (P=<0.0001)*** *after the 1ˢᵗ & the 2ⁿᵈ sessions where a greater proportion of the control group (64%) had unbearable pain, compared to only (18% & 0%) respectively of the study group. On the 3ʳᵈ PP day, a highly statistically significant difference was also disclosed between both groups (P=<0.0001), where almost two-thirds (68%) of the control group had severe pain, compared to none of the study group.* *Conclusion: Based on the findings of the present study, it can be concluded that progressive muscle relaxation technique significantly reduced intensity of afterpains of postpartum mothers with the intervention. So, the study aim and hypothesis were achieved within the framework of the present study.* *Recommendations: The progressive muscle relaxation technique can be recommended as an effective modality for postpartum afterpain management respecting postpartum mother's preferences.*

Keywords: Progressive muscle relaxation technique, Afterpains, multiparous women.

Introduction

Puerperium is one of the most significant periods that create an influential and unique experience in women's lives and their families. All postpartum - related experiences are rooted into women's reminiscences and shape their maternal identities. It is referred to as the period next to delivery when the mother's body, generally, and her genital organs, particularly, get back to their pre-pregnancy state with the least amount of alteration still present. This time period lasts between 4 and 8 weeks. During this period the women experience many physiological and psychological changes (Paliulyte et al., 2017; Xiao et al., 2019).

Generally speaking, the physiological changes are divided into general and specific changes. Firstly, general physiological changes include: Cardiovascular, hematological, endocranial, gastrointestinal, Integumentary, musculoskeletal and urinary systems, in addition to changes in women body's weight and their vital signs are expected to happen. Also, metabolic changes of pregnancy are reversed and lactation is established (Salhan, 2016; Tandon et al., 2016)

Secondly, specific physiological changes include: reproductive system which involves the uterus, cervix, vagina, perineum, supportive structures, breasts as well as return of ovarian functions. As a result of return of body systems to its normal positions (systems adaptation), the postpartum women experience some of minor discomforts (Chauhan & Tadi, 2021). Among these minor discomforts is afterpains.

Afterpains are the painful sensations that follow the expulsion of both the placenta and uterine membranes. They are caused by the uterus' fast and inconsistent contractions. Like labor pain, it is felt in the lower abdomen and lower back. Numerous factors affect Afterpains as follows: multiparity due to weakness of uterine muscles, overdistended

uterus due to a large size baby, multiple pregnancy & polyhydramnios. Due to the central nervous system's elevated sensitivity and the uterine muscle's lower strength in the case of multiparity, Afterpains becomes more severe. In nulliparous women, due to their strong uterine muscles, Afterpains are less frequent and typically not experienced because the uterus' smooth muscles are well contracted after birth (Deussen et al., 2020; Smith et al., 2022).

Concurrently, postpartum Afterpains induce the sympathetic nervous system to go into stress mode, boosting blood pressure, blood glucose levels, muscular tension, heart and respiration rates, and blood coagulation. The "fight or flight" response is boosted by the adrenal cortex's production of glucocorticoids, which also inhibit the immune system and increase vulnerability to disease. Also, it has been documented by the postpartum women that the afterpain is a major burden requiring powerful pain relief treatments as pharmacological analgesia and non-pharmacological therapy (Blackburn, 2018; Gökşin & Ayaz-Alkaya, 2018; Pessel & Tsai, 2019)

Non-steroidal anti-inflammatory medicines (NSAIDs) and paracetamol are two examples of prescribed medications used in pharmacological treatment. Despite the fact that pharmacological pain relief may be beneficial, breastfeeding mothers need to be taken into account. Therefore, it is crucial to offer women during the postpartum time effective and secure pain management options and alternatives. (Heitmann & Schjøtt, 2020; Mall et al., 2019).

Edmund Jacobson (1938) developed progressive muscle relaxation (PMR), which is well-known in the literature. This approach or intervention seeks to assist the user in developing a conscious awareness of the differences between the tension and relaxation sensations within the same muscle

region. This will enable the woman to grip the advantages of being in a relaxed state and to attain deep muscular relaxation in all of her muscles. PMR is a therapeutic technique for managing pain that can reduce the emotional mechanisms of pain, fortify the coping abilities, give patients a controlling feeling, help in relieving the pain, alleviate fatigue, as well as enhance the sleep quality that is extensively applied to induce nerve-muscle relaxation (Devmurari & Nagrale, 2018; Ismail & Elgzar, 2018; Muller et al., 2016).

The deliberate stretching and relaxing of the body's major muscle groups, beginning with the face and ending with the feet, through systemic sequential muscle tension for 5-7 seconds, followed by relaxation for 10-12 seconds, is included in this context as part of PMR technique. In addition, deep breathing can be utilized during the intervention. When the muscles are tense, it is possible to hold your breath and then let it out when they are relaxed. This will enable the woman to gain the advantages of practicing deep breathing (Devmurari & Nagrale, 2018; Peciuliene et al., 2015).

An essential factor in the effectiveness of PMR and other relaxation techniques is daily practice. Many researchers had suggested that two sessions/day each session 10-minute has a significant reduction in pain intensity (Baird & Sands, 2004) (Snyder & Lindquist, 2018a). The majority of studies revealed that the progressive relaxation technique has been evaluated immediately following administration of the intervention (Snyder & Lindquist, 2018b).

Lastly but not least, postpartum nurses are crucial to the healing process. They perform a number of medical settings and employ a wide spectrum of skills to offer care for mothers, newborns, and their families. Moreover, one of their most important responsibilities in the postpartum period is to always keep the woman's pain rating scale between 0 and 2 points, especially after breast-feeding. This can be achieved by regularly evaluating the woman's level of discomfort. Pain is recognized as the 5th vital sign; therefore, it must be evaluated as well as the other four parameters. Utilization of non-pharmacological interventions like relaxation technique is important in order to increase women's feeling of pain control as well as decreases their feeling of weakness besides, improving their activity level and functional capacity. Therefore, the objective current study's is to evaluate the effect of progressive muscle relaxation technique on postpartum Afterpains intensity among multiparous women (Bang et al., 2014; Cooke, 2013; Greenberg, 2020).

Aim of the Study

To determine the influence of progressive muscle relaxation (PMR) technique on postpartum afterpains intensity among multiparous women.

Research hypothesis:

Multiparous postpartum women who practice progressive muscle relaxation procedure exhibit less afterpains intensity than those who don't practice it.

Materials and Method

Materials

Design: A quasi-experimental research design was applied in the current research.

Setting: our present research was done at the postnatal unit of El-Shatby Maternity University Hospital affiliated to Alexandria University.The previously mentioned setting was chosen because it has satisfactory turn over for the research and the hospital receives women of different socioeconomic status from nearby Governorates.

Subjects:

A Convenient sample of 100 postnatal mothers from the above-mentioned setting was recruited in accordance to the next inclusion criteria: Multipara with normal course of pregnancy, labor and postpartum, free from any chronic medical and obstetrical problems, doesn't receive any pharmacological pain relief measures. The sample size was calculated using power analysis (Epi-info7) program depending on the following parameters: Population size is 1350 per 3 months with anticipated frequency 50%, acceptable error 10%, and confidence coefficient 95%, minimal sample size 98 women. Final sample size was 100 women.

Tools: for collecting the necessary data for the research, 3 tools were used: **Tool one: "Women's socio–demographic and clinical data structured interview Schedule:**

The researcher developed a tool that has three main components:

Part (I): Information on women's sociodemographic, including their age, education level, occupation, place of residence at the time, and family structure.

Part II: Reproductive history, including gravidity, parity, previous delivery type, previous pregnancy and labor difficulties, as well as the number of abortions, stillbirths, and live births.

Part (III): Clinical assessment sheet, which included baseline data such as vital signs, uterine consistency, and level of fundus.

Tool 2: Short-form McGill Pain Questionnaire (SF-MPQ):

This tool was originally established by Melzack (1987), and revised by Terkawi et al. (2017) to ensure compatibility with Arabian culture. It was adjusted and interpreted into Arabic language by the researcher to evaluate the sensory and affective behavior associated with pain.

This tool has 2 subscales:

*Pain Rating Index (PRI), which compr*ises 16 items which reflects equally the sensory (11 items) and affective (5 items) dimensions of pain. These items were responded by 5 points Likert like scale as follows: 0 = None, 1= Mild, 2 = Moderate 3 =Severe, 4 = Unbearable pain. The total score was ranged between 0 to 60 and classified as follows: No pain = 0, mild pain (from 1 to 15), moderate pain (from 16 to 30), and severe pain (from 31 to 45), and unbearable pain (from 46 to 60).

Visual Analogue Scale (VAS):

It is a self-report tool that measures pain intensity on a horizontal line from 0 to 10, with 0 denoting no pain, 1-3 denoting mild pain, 4-6 denoting moderate pain, 7-9 denoting severe pain, and 10 denoting intolerable pain.

Tool 3: A modified version of Chamber Price Pain Rating Scale (CPPRS)

Originally, it was created by Chambers and Price (Basyouni et al., 2018). and then revised for its reliability& validity (Haefeli & Elfering, 2006). This tool was adapted for measuring any behavioral responses towards pain including 4 dimensions: gross motor activity, posture, verbalization and face expression. For each dimension, one of 3 alternatives (0, 1, 2) is to be elicited by the researcher. For posture, the alternatives are: very relaxed, guarded and tense posture. For gross motor activity, the alternatives are: very restless, slightly restless and quiet. For facial expression, alternatives are: no frowning, some frowning and constant frowning or grimacing. Lastly, women's verbalization differs between normal, no sound, groans/moans, and cries/sobs. The total score of the 4 dimensions varies between 0-8 and categorized as follows: no pain (0) mild pain (1-2), moderate pain (3-4), severe pain (5-6), and intolerable pain (7-8).

Method

The research was accomplished according to the next steps:

The faculty of nursing's research ethics committee granted its approval on conducting this study. An official approval for conducting our research was obtained from the vice dean of the graduated students after providing clarification of the aim of the study. Also, an informed consent was obtained from the postnatal women subjected in the research. The study tools were tested for content validity by seven experts in the field of the study. The necessary changes were done accordingly. The tools' reliability was tested using Cronbach's Alpha test and the reliability coefficient was acceptable as (PRI= 0.96, VAS =0.93 while CPPRS=0.91).

A pilot research was done on 10% of the study sample in order to test the clarity and applicability of the research tools. Collection of data covered a period of 4 months starting from the middle of February till the middle of June 2022, 2 days/week; 4-5 postpartum women /day.

Data collection:

Data was collected through the following phases:

1 -Assessment Phase
- Data obtained from tool 1 was gathered from postnatal mother during the immediate postpartum time-period, via an interview schedule, which was individually conducted.
- The 1st 50 females who met the inclusion standards were assigned for the control group and the second 50 women were assigned for the study group.

2-Preparation Phase:

The researcher prepared a safe, clean, and calm environment as well as adjusted lighting and room temperature.

3-Implementation Phase:

The researcher demonstrated PMR technique to each woman individually, followed by a re-demonstration by the women 3-4 times until she can master all the steps.

The researcher started the session and asked each woman to:
- Empty her bladder and sit on the chair in a comfortable position.
- Take a deep breathe (inhale deeply through the nose, feeling her abdomen rise as one inflate the body with air and exhale slowly out through the mouth), then breathe deeply through her nose, feeling her abdomen rise as she fills her body with air, and then gently exhale out of her mouth. Repeat constantly for 3-5 times.
- Tighten the face muscles, wrinkle the forehead, frown nose, close eyes very tightly, pursed the lips and hold for 5-7 seconds, then release the hold gradually while counting for 10 sec.
- Tighten the hands, forearms and biceps muscles.
- Clench the fist of her hands, move on to biceps by drawing the forearm up towards shoulder, then, gradually release while counting from 1-to-10 with repeating the same steps on the left arm.
- Turn her head slowly until she feels a gentle stretch, hold for five sec and then let her head drop down as far as it was comfortably gone.
- Draw and hold the abdomen for 5-7 seconds as far as she can with supporting hands and then, gradually release while counting from 1-to-10 sec.
- Tighten the Gluteal muscles by pulling them together, hold for 5-7 sec and then

release gradually while counting from 1-to-10 sec.

- Tighten her leg muscles by lifting the leg off the ground, straightening knee and pointing toes toward the head; hold for 5 sec then, release gradually while counting from 1-to-10 sec with repeating the same steps on the other leg.

- Women received progressive muscle relaxation technique through two sessions of one-hour intervals, where the duration of each session was approximately 10 minutes.

- The researcher instructed the woman to perform the progressive muscle relaxation technique at home for 10 minutes, 2 times /day (in the morning and in the evening) for 2 days; meanwhile, she followed her through phone calls.

- Women of the control group didn't practice the progressive muscle relaxation technique.

4 -Evaluation phase

- The researcher evaluated afterpains intensity for the study group five times at the postnatal unit; before the first session (pre-test), after the first session (post-test), before the second session (pre-test), after the second session (post-test), the fifth time was on the 3rd day postpartum (post-test).

- The researcher evaluated afterpain intensity for the control group five times as mentioned before, but without giving sessions.

- The researcher carried out the fifth evaluation of afterpains intensity for both groups on the 3rd day postpartum at the hospital.

- After completing the data gathering, a comparison between the 2 groups were done to assess the effectiveness of progressive muscle relaxation procedure on the intensity of afterpains.

Statistical analysis:

By applying Statistical Package for Social Sciences (SPSS) version 23 program, the gathered data were classified, coded, digitized, calculated and finally, the data was analyzed. Statistical measures were applied such as cross tabulation for describing and summarizing the categorical variables of both groups. Both descriptive and analytical statistics were applied such as percentages, mean & SD; whereas Chi-square-test, Fisher Exact-test were used to discover the differences in the results at < 0.05 (5%) level of significance.

Ethical Considerations:

- Appropriate ethical approval was obtained.

- A written informed consent was approved by each participant after clarifying the aim of the research.

- Participants' private information and right to leave at any time were respected.

- The participants' data was assured to remain confidential.

Results

Table (I) illustrated the postnatal women's distribution in accordance to their socio-demographic data. ***The mean age*** was 30.12 ± 5.982 years for the study group and 29.70 ± 4.514 years for control group. ***Level of education*** also showed that less than two -thirds of the study group (64%) in compare to almost half of the control (56%) respectively were uneducated and read & write in addition, ***occupation*** manifested that a considerable proportion of the study and the control groups (70% & 60%) were housewives respectively.

Regarding, marital status showed that all and almost all (100% 98%) of the study and the control groups respectively were married. Furthermore, current residence and type of family demonstrated that a considerable proportion of the former and the latter groups (64% & 78%) were rural residents correspondingly, whereas (62% & 78%) of them respectively had extended families. However, the two groups were homogenous, where no statistically

significant variances were discovered among their demographically data.

Table (II) showed the postnatal women's distribution in accordance to their reproductive history. It was clarified that around two-thirds (66% & 68%) of both study and control groups had 4-7 *pregnancies* respectively; about three-fifths (56% & 58%) of them respectively had no *abortion*; and more than half of the study group (54%) had 1-3 deliveries in compare to (48 %) of the control respectively. However, all (100%) of the two groups had *normal deliveries*. It was also elucidated that the majority of both study and control groups (86% & 90%) had *no stillbirths* respectively, and almost three-fifths (56% & 60%) of the both groups had 1-3 *living children* respectively.

In addition, previous pregnancy complications were reported by 46% & 32% of the study and the control groups respectively. Yet, bleeding was the major difficulty reported by half and more (52% & 50%) of the former and the latter groups respectively. Moreover, previous labor complications were reported by a minority of the study and the control groups (10% & 24%) respectively. Nevertheless, bleeding was the major complication reported by 100% of the former group, compared to 58% of the latter group. Furthermore, previous postpartum complications were experienced by only (10% & 12%) of the study and the control groups respectively. However, bleeding was the main complication experienced by 100% of the former group, compared to 33.3% of the latter group.

Table (III) illustrates the distribution of postnatal women inline of their medical data. It was observed that the mean temperature was 36.784 ± 0.357 ℃ & 36.733 ± 0.393 ℃ for the study and control groups respectively; the mean pulse was 81.64 ± 10.398 b/m & 79.62 ± 7.469 b/m for the both groups respectively; the mean of systolic blood pressure was 114.20 ± 7.848 mm Hg & 115.20 ± 9.089 mm Hg for

them respectively; the mean of diastolic blood pressure was 79.90 ± 8.481 mm Hg & 77.60 ± 7.616 mm Hg respectively and the mean respiration was 19.42 ± 0.642 breaths/m & 19.30 ± 0.789 breaths/m respectively.

On the other hand, consistency of the uterus was firm among most of study and control groups (94% & 96%) correspondingly. For the meantime, the uterus' fundus was at the level of umbilicus among the majority of both groups (76% & 86%) correspondingly. Thereby, the correlation between the 2 groups' clinical data wasn't statistically significant.

Figure (1) demonstrates the distribution of postnatal women inline with their total score of sensory and affective dimensions of pain, by PRI. Before the 1st session, unbearable pain reduced severely from 52% to 18% among the study group. In contrast, it didn't change (64%) for the control group. After the 2nd session, unbearable pain dropped sharply from 18% to 0% amongst the study group, while it persisted to be the same (64%) amongst the control group. On the third PP day, severe pain declined from 20% to 0% among the study group, while it was raised sharply from 14% to 68% among the control group.

Fig (11) demonstrates the distribution of postnatal women according to their total scores of pain intensity, using VAS. Unbearable pain declined sharply from 68% to 18% after the 1st session and from 18% to 0% after the 2nd session among the study group, while it remained the same (64%) after the same sessions among the control group. On the 3rd PP day, severe pain descended from 18% to 0% among the study group, while it ascended from 14% to 68% among the control group.

Figure (III) elucidates the distribution of postnatal women inline with their total scores of behavioral responses to pain, by CPPRS. Unbearable pain fell sharply from 76% to 18% after the 1st session and from 18% to 0% after the 2nd session among the study group, while it persisted the same (64%) after these sessions

among the control group. On the 3rd PP day, severe pain descended from 18% to 0% amongst the study group, while it ascended sharply from 14% to 68% amongst the control group.

Discussion

It has been established that Afterpains are a significant concern for women throughout the postpartum period. Nevertheless, clinical research in the area of its management is poorly funded. Evidence to support measures to reduce it is therefore scarce. A wide variety of both pharmacological and non-pharmacological afterpains relieving procedures are currently available. (Blackburn, 2018; Gökşin & Ayaz-Alkaya, 2018; Pessel & Tsai, 2019).

The progressive relaxation therapy also known as Jacobson's relaxation technique was invented by Dr. Edmund Jacobson during the 1920s. It is the type of treatment that concentrates on contraction and relaxation of certain muscle groups in sequence. Jacobson's relaxation technique is the most common type of non-pharmacological measures for Afterpains' relief, which was recognized in the literature since 1938. The aim of this technique is to help women to get mindful insight about the differences between tension and relaxation sensations in the same muscle group. Progressive relaxation method is highly preferable because it has minimal risk for the mother and her baby as well as it increases the interaction between the midwife and postpartum woman (Devmurari & Nagrale, 2018; Goldman, 2021).

Our major findings in the current study revealed that:

In the current study, according to our obtained results, it can be noticed that both study and control groups were similar in almost all of their socio-demographic and medical data as well as their reproductive history (Tables I-II-III). This can be interpreted as most females attending El-Shatby Maternity University Hospital are from the same socioeconomic class more or less. The participants' uniform profile generally helped to limit extraneous factors that could affect the targeted intervention's impact on Afterpains intensity. It also helped in understanding and verifying the validity and applicability of subsequent study results.

On assessing the effect of progressive muscle relaxation technique on sensory and affective afterpains' dimensions, as well as intensity and behavioral responses, the present study's results showed that severe and unbearable afterpains were significantly reduced sharply and dramatically amongst the study group after intervention, in compare to the control (figures I, II & III). Among the former group, reduced Afterpains' intensity might be accredited mostly to their greater comfort and well-being, that is likely permitted by the used intervention. Also, the probable positive effect of progressive muscle relaxation technique on reducing the Afterpains intensity might be due to the increased body's immunity and sense of wellbeing through the release of endorphins, the natural pain-killing and mood-lifting chemicals produced in the brain. Additionally, this intervention may elevate the controlling sensation, enhance the capability to block inner thoughts, and consequently improve sleep (Dhyani et al., 2015; Mohiuddin, 2019).

Our current findings relatively corresponded with a report done in Sao Paulo state, Brazil, where it was determined that PMRT have expressively decreased perception of pain among the study group, in compare to the control (de Paula et al., 2012). Also, our current findings were relatively conformed to a report conducted in South Florida, US, where it was recommended that certain relaxation techniques may be partially responsible for Cortisol declines related to relaxation and the management of cognitive – behavioral stress. It was emphasized that practicing relaxation is very effective through stimulating the release of endorphins, and in

turn suppresses Cortisol levels in normal human subjects. This may help reduce pains and stresses as well as increase feelings of wellbeing and relaxation (Jones et al., 2014).

In addition, our present results is relatively in harmony with a report performed in Maharashtra, India by **De**vmurari & Nagrale, (2018) where they discovered a significant difference in mean pain scores values between the experimental group and control, their results confirmed that pain was more reduced among experimental group than control one. Moreover, it relatively in line with a report executed in Ankara, Turkey, where it was revealed that PMR prompted a reduction in anxiety, as well as decreased perception of pain, that may enhance QOL in the postpartum period (Goksin & Ayaz-alkaya, 2018).

Also, our current results are relatively consistent with a research conducted in Damanhour, Egypt, where it was discovered that progressive muscle relaxation technique significantly reduced pain intensity as well as improved physical activities, and sleep quality in women following CS delivery. These results might be accredited to the fact that the progressive muscle relaxation technique decreases sympathetic activity, increases parasympathetic activity and thus widens the peripheral vessels and increases blood flow in them, as well as decreases pain perception and muscle tension. Furthermore, it can elevate the oxygen saturation, reduce the oxidative factors, and thus, lessens the pain. In turn, this can decrease the breathing rate, the blood pressure, the cardiac index, the heart rate, and enhances performance of physical activities, producing cool or warm body parts. (Ismail & Elgzar, 2018 Peciuliene et al., 2015).

Moreover, the present results is relatively in line with a report implemented in Medan, Indonesia, where it was demonstrated that usage of progressive muscle relaxation technique is anticipated to be applied as an intervention in labor pain management and consequently Afterpains (Nasution et al.,

2020). Furthermore, it relatively corresponds to a report made in West Java, Indonesia, where it was suggested that progressive muscle relaxation technique could be applied as a non-pharmacological intervention in pain management (Pragholapati, 2020) .

Likewise, our present data are relatively coincides with a report done in Iowa, US, where the effectiveness of PMR approach for relaxation was evidenced. Meanwhile, this study provides confirmation that indicates the advantages for promoting both psychological and physiological relaxation statuses. At the psychological and the physiological levels, this study results suggest that PMR offers good improvement in relaxation (Toussaint et al., 2021).

Besides, the current results relatively in line with a research accomplished in Maharashtra, India, where it was demonstrated that there is noteworthy difference in mean values between pains scores of experimental group and control, whereas pain is more reduced in the study group than the control group. Therefore, it was emphasized that relaxation therapy is one of non-pharmacological approaches that decrease pain as it reduces pain by interrupting its cycle, sympathetic activity and muscle tension. Relaxation also decreases anxiety and muscle tension as well as increases control over some aspect of pain and even relieves pain. Additionally, it might reduce physiological input brought on by secondary reflex muscle contraction and change psychological traits including attention, anxiety, and perceived control. Additionally, using relaxation techniques lowers muscular pressure at the level of the arterioles, resulting in reduced tension and less energy being sent into the hypothalamus (Devmurari & Nagrale, 2018).

However, a Cochran Database of Systematic Reviews reported that relaxation provided lower intensity of pain during labor, but there was no strong evidence to support research findings. On the other hand, although the quality of evidence varies between very low and low, relaxation may have a role with

reducing pain, and increasing satisfaction with pain relief. Very low-quality evidence also showed that women receiving relaxation reported greater satisfaction with pain relief during labor. In addition, no clear benefit for satisfaction with childbirth experience as well as sense of control in labor, and breastfeeding were reported (Smith et al., 2018) The discrepancy between this Cochran Database of Systematic Reviews and the present research is due to the design of research as well as methods of data collection and analysis.

Conclusion

Based on the present study's findings, it can be concluded that progressive muscle relaxation technique has significantly reduced intensity of Afterpains of postpartum mothers. Hence, our study aim and hypothesis were achieved within the framework of the present study.

Recommendations

Based on the obtained results from the present study, our recommendations are:

- The progressive muscle relaxation technique must be offered as a part of standard postpartum care in hospitals.

- In-service training programs must be done for postpartum healthcare providers to elevate their awareness about the progressive positive effects muscle relaxation technique in managing postpartum Afterpains.

- The progressive muscle relaxation technique can be recommended as an effective modality for the postpartum Afterpains management respecting postpartum mother's preferences.

Table (I): Distribution of postnatal women according to their socio - demographic data

Socio - demographic data	Study Group (n=50)		Control Group (n=50)		t- test (P) χ^2 / F (P)
	No	%	No	%	
-Age (years):					
Min-max	34-20		34-20		0.396
Mean ± SD	5.982 ± 30.12		4.514 ± 29.70		(0.693)
-Level of education:-					
- Illiterate/read & write	7 32	14.0 64.0	9 28	18.0 56.0	
- Basic	11	22.0	13	26.0	0.683
- Secondary or its equivalent					(0.711)
- Occupation:-					
- Housewife	35	70.0	30	60.0	1.099
- Working	15	30.0	20	40.0	(0.294)
-Type of work:-	**(n=15)**		**(n=20)**		
-Employee	1	06.7 06.7	1	25.0 05.0	
- Worker	1	40.0	5	15.0	3.921
- Merchant	6	46.6	3	55.0	(0.270)
- Farmer	7		11		
-Marital status:-					
-Married	50	100.0	49	98.0	1.01
-Divorced	0	00.0	1	02.0	(0.315)
-Current residence :-					
- Urban	18	36.0	11	22.0	2.38
- Rural	32	64.0	39	78.0	(0.123)
- Type of family:-					
- Nuclear	19	38.0	11	22.0	3.048
- Extended	31	62.0	39	78.0	(0.081)
:Family income/month					
- More than enough	0	98.0 00.0	3	86.0 06.0	5.191
- Just enough	49	02.0	43	08.0	(0.075)
- Not enough	1		4		

$\square^2$ (P): Chi-Square Test & P for $\square^2$ Test

F (P): Fisher Exact test & P for F Test

*: Significant at P ≤0.05

Table (II): Distribution of postnatal women according to their reproductive history

Reproductive history	Study Group (n=50)		Control Group (n=50)		F / (P) t-test (P)
	No	%	No	%	
-Occurrence of previous postpartum complications:					
- Yes	5	10.0	6	12.0	0.102
- No	45	90.0	44	88.0	(0.749)
-Type of previous postpartum complications:	**(n=5)**		**(n=6)**		
- Bleeding	5	100.0	2	33.3 33.3	
- Puerperal sepsis	0	00.0	2	33.3	5.238
- Breast complications	0	00.0	2		(0.073)
-Duration of current pregnancy (weeks):					
Min-max	40-37		40-37		1.097
Mean ± SD	0.961 ± 38.34		0.759 ± 38.53		(0.275)

More than one response

^{2} (P): Chi-Square Test & P for □^{2} Test   F (P): Fisher Exact test & P for F Test   *: Significant at P ≤0.05

Table (III):   Distribution of postnatal women according to their clinical data

Clinical data	Study Group (n=50)		Control Group (n=50)		(P)χ^2 / F
	No	%	No	%	
-Temperature (ºC):					
Min-max	37.3 - 36		37.3 - 36		0.679
Mean ± SD	0.357 ± 36.784		0.393 ± 36.733		(0.499)
-Pulse (b/m):					
Min-max	100 - 65		90 - 65		1.116
Mean ± SD	10.398 ± 81.64		7.469 ± 79.62		(0.267)
-Systolic BP (mm Hg):					
Min-max	130-100		140-100		0.589
Mean ± SD	7.848 ± 114.20		9.089 ± 115.20		(0.557)
-Diastolic BP (mm Hg):					
Min-max	90-60		90-60		1.427
Mean ± SD	8.481 ± 79.90		7.616 ± 77.60		(0.157)
-Respiration (breaths/m):					
Min-max	22-19		22-19		0.834
Mean ± SD	0.642 ± 19.42		0.789 ± 19.30		(0.406)
-Uterine consistency					
- Firm	47	94.0	48	96.0	0.211
- Soft	3	06.0	2	04.0	(0.646)
-Level of the fundus					
- At the umbilical level	38	76.0	43	86.0	
- Above the umbilical level	9	18.0	6	12.0	1.909
- Below the umbilical level	3	06.0	1	02.0	(0.385)

χ^2 (P): Chi-Square Test & P for χ^2 Test
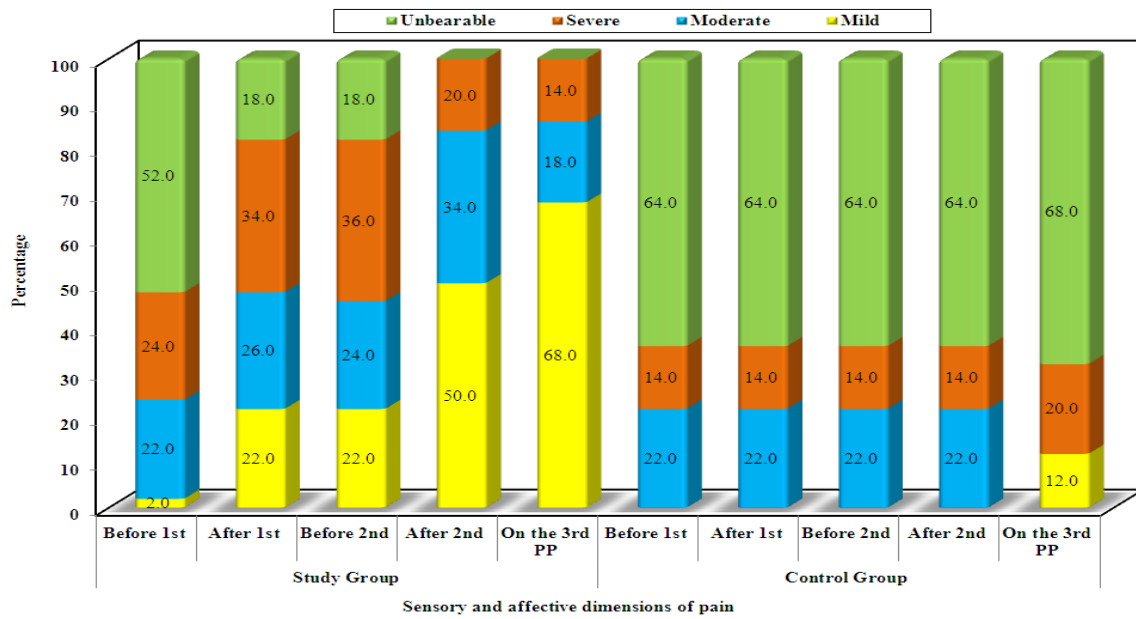F (P): Fisher Exact test & P for F Test
*: Significant at P ≤0.05

Figure (I): Distribution of postnatal women according to their total scores of sensory and affective dimensions of pain, using PRI

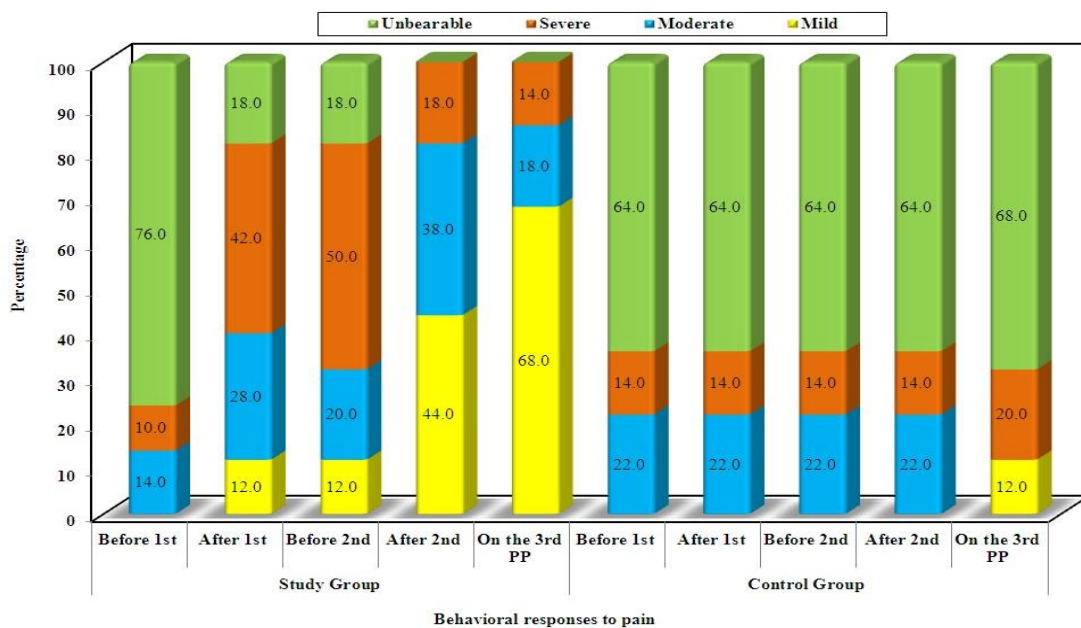**Figure (II): Distribution of postnatal women according to their total scores of pain intensity, using VAS**

Figure (III) : Distribution of postnatal women according to their total scores of behavioral responses to pain, using CPPRS

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