

Effect of Breathing Exercise on after pains among Postpartum Women

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Abstract

Background: Puerperium extends between end of placenta delivery and proceeding approximately six weeks. During this period the woman returns back to her pre-pregnant state, preceding many physiological symptoms, most common afterpains.

Objective: This study aims to identify the effect of breathing exercise on afterpains among postpartum women

Material and Methods: This quasi-experimental research was conducted in the postpartum ward of the Main Maternity University Hospital, Alexandria-Egypt. A convenient sample of 80 postpartum women meeting the specified inclusion criteria were joined up to the study. The women (80) were divided into two groups: control group receiving routine hospital care and an experimental group practicing breathing exercise under the coaching of the researcher. Each group will comprise forty women. Three days per week during a period of five months

Results: study results illustrate no statistical significant difference between the control and experimental group in relation to socio-demographic and reproductive data as well as physiological stability, as evidenced by vital signs, during the study period. Also no statistical significant differentiation was found between the two studied groups in relation to their information and expectations about afterpains. Which guaranty homogeneity of the two studied groups, while there was a highly statically significant difference between the control and experimental groups in the favor of the breathing exercise.

Conclusions and recommendations: It was concluded from the study that practicing breathing exercise was effective in reduction of the mean score of afterpains among postpartum women. Researchers recommended; further studies are necessary in order to conclude a causal association between deep, slow breathing exercise and afterpains among postpartum women in different samples and settings.

Keywords: breathing exercise, afterpains, postpartum.

I. Introduction

Puerperium is a time when the mother is switching and adjusting to her new developmental role parallel to her social celebration of a new life, hence this critical phase is considered confusing to many women going through it especially for postpartum women (1, 2). Discomfort and after pains are a chief complain for mothers during their post partum period.

Immediately after the expulsion of the products of conception, the uterus begins the process of involution. During this process, the uterus normally contracts painlessly into a hard, firm, smooth, muscular mass approximately ten centimeters in diameter. On abdominal palpation the apex of the fundus can be felt at or slightly below the umbilicus. No change in the size of the uterus is noted for approximately two days, after which it rapidly diminishes in size and, within five to six weeks, regains its normal size (3-5).

During this involutonal process, some women, experience painful uterine contractions which are commonly called afterpains (6). The pain has been described as pulling, tugging, cramping, sharp, or dull. The most severe discomfort produced from these painful uterine contractions seems to occur within the first 48 hours after delivery (7). No explanation of the cause or mechanism of uterine pains has been universally accepted. However, several predisposing mechanisms have been identified. Simultaneously, afterpains may be due to ischemia of the uterus as the result of uterine contractions (8).

According to **Weidencach's PRESCRIPTIVE THEORY 1964 (9)**, nursing is the practice of identifying patient needs, determining the cause of discomfort and helping the patient to use her potentials to resolve discomfort where *patient* could be any one needs help not necessary ill. According to this theory the obstetric nursing practice is enhanced when gaining postpartum woman's cooperation to overcome afterpains through interventional practices including non-pharmacological methods of pain relief such as breathing exercise. Afterpains is one of the postpartum mother's immediate needs. However if the mother use her own efforts to relive it; she can do this without assistance latter on (10). It is a fact that intervention for pain and discomfort during labor and postpartum is a major part of modern obstetric care for laboring women and a challenging issue for nurses designing intervention protocols (11). Nurses, who care for women, must learn to

understand, assess, and intervene with the postpartum pains and discomfort as both a sensory and affective phenomenon. These must be done according to the individual woman's needs and desires. In the fields of obstetric nursing and midwifery, the main professional goal has been to ensure a safe and optimal labor experience with minimal pain and discomfort. It was found that women with positive feelings about their labors and births recalled being well cared for and supported by health care personnel. Vice versa, women with negative feeling associated with childbirth recounted unpleasant and disappointing interactions with hospital staff (12). Within this context, nurses should never underestimate their ability to increase or diminish a woman's feelings of self-esteem, sense of accomplishment, and overall satisfaction with birth and strive to assist all clients with their transformation to parenthood.

Significance of the study:

One of the most crucial tasks of obstetric nurse is to support women during postpartum period. Efficient after pains' management is a critical part of obstetric nursing care to endorse postnatal recovery, it defiantly reduces anxiety and helps mother to cope with her new life and accomplish her family functioning. Non pharmacologic measures are often simple, secure, and reasonably priced method for pain relieve, extensively studied for labor pain. Yet postpartum after pains is still a neglected area of research. **Breathing exercise** is a non-pharmacological pain relieves measure that has been set up as effective for acute pain in situations other than after pains (13). But there is a lack of research evidence to support its effectiveness in relieving the after pains. Therefore this study was conducted to examine the effect of breathing exercise on afterpains for postpartum women.

Aim of the Study

The aim of this study is to determine the effect of breathing exercise on afterpains among postpartum women

Operational Definition

In the context of this study the breathing technique is; when feeling afterpains coming, the researcher instructs the postpartum woman to begin to focus on her breathing, and invite her body and mind to begin to relax. Take slow deep breath from nose, imagining the air flowing in to the very bottom and top of lungs, letting all areas of lungs expand with air and then fall while blowing air from mouth. Again return breathing to normal. ⁽¹⁾

Hypothesis

The researchers hypothesized that postpartum mother who was trained on self-care method such as breathing exercise to relieve afterpains would have more tolerance and exhibit less pain and be able to efficiently utilize her potentials to maintain her comfort.

II. Materials And Method

Materials

Research design:

This is a quasi-experimental research design. Where the effect of breathing exercises (independent variable) on afterpains (dependent variable) will be examined

Setting:

This study will be conducted in postpartum unit of the Main Maternity University Hospital in Alexandria-Egypt. This setting was chosen because the turn over of deliveries is high.

Subjects:

The study subjects will be selected by using the non-probability sampling technique where a convenient sample of eighty postpartum women will be recruited. All subjects should meet the specified inclusion criteria. These criteria include:

- Do not receive any pharmacological pain relief substance.
- Full-term (37 to 42 weeks of gestation).
- Free from any medical or obstetric risk factors and/or conditions.
- Have a single viable fetus in cephalic presentation.
- Willing to participate in the study.

The women eighty will be assigned to one of two groups: a control group receiving routine hospital care and an experimental group practicing breathing exercise under the coaching of the researcher. Each group will comprise forty women.

Tools:

Two tools will be used for data collection.

Tool I: Socio-demographic, reproductive and clinical data structured interview schedule

This tool will be developed and used by the researcher to collect the following data:

1. Socio-demographic characteristics including: age, occupation and level of education.
2. Menstrual history including: menarche, regularity and dysmenorrhea.
3. History of current labor: uterine contractions (duration, frequency, intensity and interval), rupture of membranes and presence of show.
4. Present complains in relation to afterpains: site and character of pain.
5. Women's information and expectations about afterpains.
6. Clinical data including physical assessment such as: vital signs, and fundal assessment.

Tool II: Visual analog scale (VAS)

It was developed by Melzack and Katz (1994); it is a self-report device consisting of a horizontal line used for subjective estimation of patient's pain. It comprises 10 point numerical scale, corresponding to the degree of pain with zero representing no pain and 10 representing the worst degree of pain. In between these two opposite ends, words as mild, moderate, severe and very severe pain are assigned to each 2 cm distance, respectively⁽¹⁴⁾.

Method

1. Official approval from the directors of data collections settings was secured through an official letter from the faculty of nursing Alexandria University after explanation of the purpose of the study
2. Tool (1) was developed by the researchers and reviewed for content validity by 9 faculty members from nursing and medicine faculties.
3. Tool (2) was tested for validity and reliability by other researchers.
4. Ethical considerations: for each recruited subject were considered as; each postpartum woman was individually contracted and informed about the aim of the study in order to obtain her written consent.
5. Again each of those who agree to participate was assured about their confidentiality, privacy and right to withdraw at any time.
6. A pilot study was carried out on 5 women to evaluate the clarity and applicability of tools and no modifications was done.
7. Three days per week were specified for data collection over a period of approximately five months from beginning of July to the end of December 2016.
8. Women were selected from the previously mentioned setting according to the inclusion criteria.
9. Each laboring woman in the two groups was individually interviewed to collect basic data using tool I.
10. Each woman was assigned to one of the two study groups as follows:
 - a. The control group comprised of forty women; received the routine hospital care in addition to researcher's physical presence.
 - b. The experimental group comprised of forty women upon whom *breathing exercise* was demonstrated by the researcher and performed by the women throughout the early period of the postpartum.
11. The control group was started with and completed before starting the experimental group to avoid contamination of the sample
12. Pain states were evaluated for both experimental and control groups twice, once before and once after the period of intervention using tool II.
13. The effect of breathing exercise on postpartum afterpains was determined by comparing the mean score of pain intensity between the two groups before and after the intervention.

III. Data Analysis

SPSS software version 20 was used to analyze the data. Chi square (x²) test was significance at p value <0.05. Mean and standard deviation was considered for descriptive data. One sample t-test was used to examine whether there was any statistically significant difference between the control and the experimental (breathing exercise) group.

IV. Results

Table (1) shows the distribution of the study groups according to their Socio-demographic data. Age demonstrated that around three quarters of the control and study group (80% & 70%) respectively were between the ages of 20 to 30 years old. Level of education revealed that 42.5% of the control group and 52.5% of the experimental group had secondary education. Residence elucidated that majority of both studied groups (70% of the control group and 75% of the experimental group) were urban dwellers. In relation to occupation and marital

status, all the control group and the experimental groups were housewives and married. No statistical significant difference was found between the two groups in relation to the examined parameters.

Table (1): Distribution of the study groups according to their Socio-demographic data

Socio-demographic data	Control group (No = 40)		Experimental group (No = 40)		X2 & P value
	No	%	No	%	
Age (years)					
- < 20	4	10	6	15	X2=0.69 P=0.706
- 20-30	32	80	28	70	
- > 30	4	10	3	7.5	
level of education					
- Illiterate	15	37.5	11	27.5	X2=3.32 P =0.505
- Read and write	4	10	2	5	
- Primary/ preparatory	2	5	5	12.5	
- Secondary	17	42.5	21	52.5	
- University	2	5	1	2.5	
Residence					
- Urban	28	70	30	75	X2=0.25 P=0.617
- Rural	12	30	10	10	

Table (2) represents the distribution of the study groups according to their menstrual history. It was observed that the vast majority of the control and the experimental groups (90% & 85%) had their first menstruation between 12-15 years old. The Duration of menstruation for more than two fifths of both groups (45%) ranged between 5-6 days. Majority of them (85% & 77.5%) respectively had a menstrual interval that ranged between 28-35 days. Most of women in the control group and the experimental group (90% & 92.5%) respectively had regular menstruation. In relation to the amount of menstrual flow, more than two thirds (72.5% & 67.5%) respectively of both control and the experimental group mentioned that it was moderate. Moreover, most of both groups (97.5% & 92.5 %) had history of dysmenorrhea among them more than half (55 % & 62.5%) correspondingly, mentioned that they "usually had dysmenorrheal". When women were asked about ways to overcome dysmenorrheal; "warm drinks" was stated by half of them (55% of the control group and 52.5% of the experimental group). No statistical significant difference was found in relation to the examined parameters.

Table (2): Distribution of the study groups according to their menstrual history

Menstrual history	Control group (No = 40)		Experimental group (No = 40)		X2 & P value
	No	%	No	%	
Age at menarche (years)					
- < 12	4	10	6	15	X 2 = 0.45 P = 0. 499
- 12-15	36	90	34	85	
Duration of menstruation (days)					
- 3-4	16	40	18	45	X 2 =0.51 P =0.772
- 5- 6	18	45	18	45	
- 7	6	15	4	10	
Interval between menstruation(days)					
- < 28	4	10	5	12.5	X 2 = 0.92 P = 0.632
- 28- 35	34	85	31	77.5	
- > 35	2	5	4	10	
Rhythm					
- Regular	36	90	37	92.5	X 2 = 0.16 P = 0.692
- Irregular	4	10	3	7.5	
Amount					
- Scanty	1	2.5	1	2.5	X 2 = 0.25 P = 0.881
- Moderate	29	72.5	27	67.5	
- Excessive	10	25	12	30	
Dysmenorrhea					
- Yes	39	97.5	37	92.5	X 2 = 1.05 P =0.305
- No	1	2.5	3	7.5	
If yes: how often the woman feel dysmenorrhea					
- Usually	22	55	25	62.5	X 2 = 2.08 P = 0.557
- Sometimes	8	20	6	15	
- Often	9	22.5	6	15	
- Not Applicable	1	2.5	3	7.5	
Pain intensity of dysmenorrhea					

- Mild	7	17.5	6	15	X 2 = 1.43 P = 0.699
- Moderate	7	17.5	8	20	
- Severe	25	62.5	23	57.5	
- Not applicable	1	2.5	3	7.5	
Ways to overcome dysmenorrhea					
- Nothing	10	25	8	20	X 2 = 1.31 P = 0.726
- Analgesics	7	17.5	8	20	
- Warm drinks	22	55	21	52.5	
- Not applicable	1	2.5	3	7.5	

Table (3) clarifies the distribution of the study groups according to their reproductive data. It was observed that 75% & 80% of the control and the experimental group respectively had two pregnancies and deliveries. Moreover, minority of both groups (2.5% & 7.5%) in that order had suffered from previous abortion.

Table (3): Distribution of the study groups according to their reproductive data

Reproductive history	Control group (No = 40)		Experimental group (No = 40)		X2 & P value
	No	%	No	%	
Gravidity					
- 2	30	75	32	80	X 2 = 1.44 P = 0.486
- 3	5	12.5	6	15	
- 4+	5	12.5	2	5	
Parity					
- 1,2	30	75	32	80	X 2 = 3.73 P = 0.292
- 3	4	10	4	10	
- 4+	5	12.5	1	2.5	
- Not applicable	1	2.5	3	7.5	
Abortion					
- No abortion	39	97.5	37	92.5	X 2 = 1.052 P = 0.305
- 1	1	2.5	3	7.5	

Figure (1) exhibits the distribution of the study groups according to their weeks of gestation. It was found that around one third (37.5% of the control group & 30% of the experimental group) were full-term (38weeks), with no statistical difference between the two groups.

Figure (1): Distribution of the study groups according to their history of current pregnancy

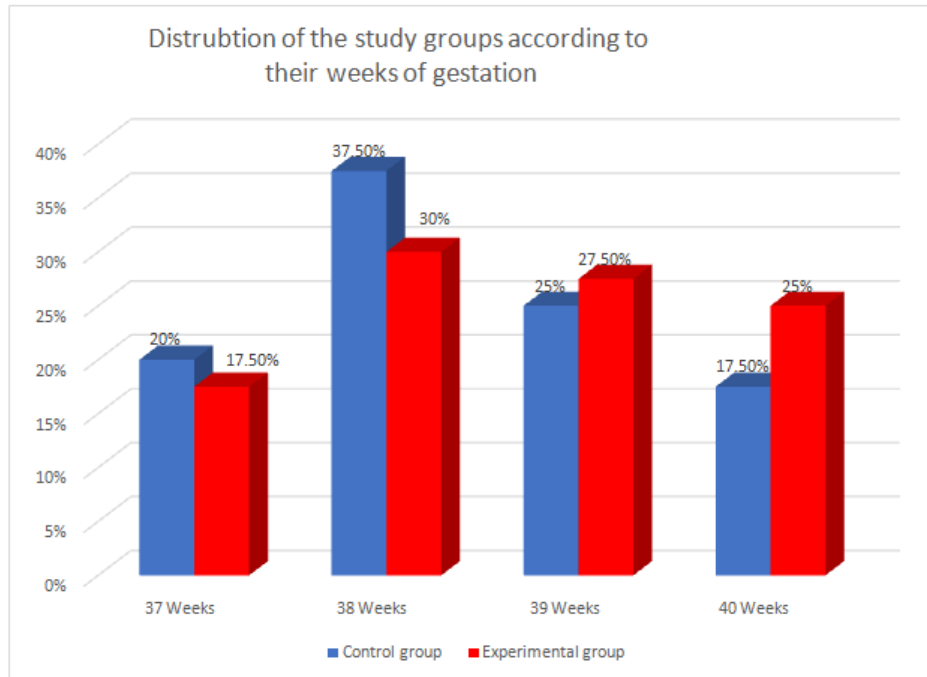


Table (4) presents the distribution of the study groups according to their mean vital signs. In general all women in both study groups were physiologically stable with normal vital signs. As regard to pulse, it was observed that the control group had the same pattern of pulse rate as the experimental group (70.7142 ± 5.0099 b/m & 70 ± 5.0636 b/m) respectively. In relation to systolic blood pressure, the table shows that the control group mean systolic blood pressure was (111 ± 4.9613) mmHg while it was (109 ± 4.9613) mmHg among the experimental group. On the other hand, the diastolic blood pressure was nearly the same mean (72 ± 4.6409 & 72.5 ± 4.3852) mmHg among the control and experimental group respectively. Regard respiration, it was noticed that mean respiratory rate of the control group was 21.85 ± 3.5268 c/m and 22.725 ± 3.3203 c/m for the experimental group. The table also shows that the mean temperature was 37.175 ± 0.1808 & 37.2 ± 0.1519 among the control group and the experimental group respectively without statistical significant difference between them in relation to vital signs.

Table (4): Distribution of the study groups according to their mean vital signs

Vital signs	Control group (No = 40)		Experimental group (No = 40)		X2 & P value
	No	%	No	%	
Pulse					
- MEAN \pm SD	70.7142 \pm 5.0099		70 \pm 5.0636		t = 0.63 P = 0.528
Systolic blood pressure					
- MEAN \pm SD	111 \pm 4.9613		109 \pm 4.9613		t = 1.80 P = 0.075
Diastolic blood pressure					
- MEAN \pm SD	72 \pm 4.6409		72.5 \pm 4.3852		t = 0.50 P = 0.622
Respiration					
- MEAN \pm SD	21.85 \pm 3.5268		22.725 \pm 3.3203		t = 1.14 P = 0.257
Temperature					
- MEAN \pm SD	37.175 \pm 0.1808		37.2 \pm 0.1519		t = 0.67 P = 0.505

Table (5) demonstrates distribution of the study groups according to their information and expectations about afterpains. Three quarters of the control group (75%) and 80% of the experimental group was not able to define afterpains or its duration, as well as they had no expectation about afterpains whether it will be mild, moderate or severe. Also the table shows that the vast majority of both groups (95% & 97.5%) didn't know the predisposing factors for afterpains. No statistical significant difference was found in relation to the examined considerations.

Table (5): Distribution of the study groups according to women's information and expectations about afterpains:

women's information about after pain	Control group (No = 40)		Experimental group (No = 40)		X2 & P value
	No	%	No	%	
Define afterpains					
- Know	10	25	8	20	X 2 = 0.29 P = .592
- Do not know	30	75	32	80	
Duration of afterpains					
- Less than one day	2	5	2	5	X 2 = 0.35 P = .839
- More than one day	8	20	6	15	
- Do not know	30	75	32	80	
Predisposing factors of afterpains					
- Breast feeding	2	5	1	2.5	X 2 = 0.35 P = .841
- Full bladder	-	-	-	-	
- Do not know	38	95	39	97.5	
Women expectation about afterpains					
- Mild	1	2.5	1	2.5	X 2 = 0.73 P = .866
- Moderate	4	10	2	5	
- Severe	5	12.5	5	12.5	
- Do not know	30	75	32	80	

Table (6) shows the distribution of the study groups according to the intensity of their afterpain as measured by visual analogue scale (VAS) before and after breathing exercises. More than two fifth (45%) of the control group had moderate pain before routine hospital care compared to more than three fifth (67%) of the same group after routine hospital care while approximately one third (32.5%) of the experimental group suffered

from moderate pain before the breathing exercise compared to around one fifth (22.5%) after the intervention. A statistical significant difference was noticed among women of the control group before and after routine hospital care where $P = 0.0352$, it's a pity that the difference was to the favor of the increased pain intensity for this group. Vice versa the statistical difference for the experimental group shows decreased pain intensity after breathing exercise than before the practice where $P = 0.0256$.

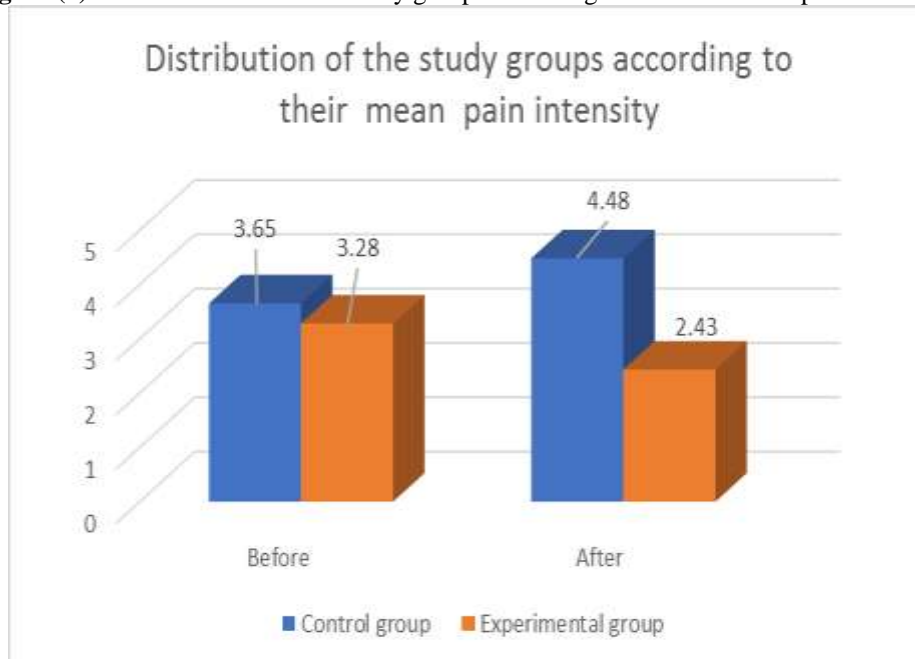
Table (6): Distribution of the study groups according to the intensity of their afterpain (as measured by visual analogue scale (VAS) before and after breathing exercises

Intensity of labor pain as measured by (VAS)	Control group (No = 40)				Experimental group (No = 40)			
	Before routine hospital care		After routine hospital care (30 min)		Before breathing exercise		After breathing exercise (30 min)	
	No	%	No	%	No	%	No	%
. No pain (zero)	-	-	-	-	-	-	5	12.5
. Mild (From 1 to 3 points)	20	50	10	25	25	62.5	26	65
. Moderate (From 4 to 6 points)	18	45	27	67.5	13	32.5	9	22.5
. Severe (From 7 to 9 points)	2	5	3	7.5	2	5	0	0
. unbearable (10 points)	-	-	-	-	-	-	-	-
Mean \pm SD	3.65 \pm 1.791		4.48 \pm 1.6484		3.28 \pm 1.7829		2.43 \pm 1.5506	
T. test	2.1438				2.2752			
*P. value	0.0352				0.0256			

*Statistical significant

Figure (2) compares the study groups according to their mean afterpains intensity. It was clear that the pain intensity score was 3.65 among the control group before routine hospital care increased to 4.48 after routine hospital care. On the other hand, it was 3.28 among the experimental group before breathing exercise decreased to 2.43 after breathing exercise. There was a highly statistically significant difference found between the two groups after the interventions where p is less than 0.0001

Figure (2): The distribution of the study groups according to their mean afterpains intensity.



T. test = 5.7290 *P. value < than 0.0001

*Statistical significant

V. Discussion

Eighty postpartum women, meeting the inclusion criteria were enrolled to the study sample. Out of which forty women were assigned to the control group where routine hospital care was applied for them and the other forty practiced controlled breathing exercise during their afterpains. In general, study results illustrate no statistical significant difference between the control and experimental group in relation to socio-demographic and reproductive data as well as physiological stability, as evidenced by vital signs, during the study period. Also no statistical significant differentiation was found between the two studied groups in relation to their information and expectations about afterpains. Which guaranty homogeneity of the two studied groups. On the other hand, there was a highly statically significant difference between the control and experimental group in relation to afterpains, where the experimental group exhibited decreased mean score of afterpains than the control group.

This study exemplifies that women in both groups had no information or expectations about their afterpains. The researchers attribute that result to the fact that all women are concerned about labor pain imagining that it will be end with the delivery of fetus without any idea that postpartum period is a significant phase of birth process, with many physical and psychological changes. Congruent with the current finding; Gibson E, 2014 (15) had mentioned that, women were concerned with the pain of childbirth before and after their labor experiences. Another explanation of this result that most of counseling given during pregnancy emphasis on helping the woman to plan and prepare for birth, neglecting health education about puerperium except breast feeding (16)

The principal finding in this study is that postpartum women practiced breathing exercise reported significantly less afterpains than women without that breathing implementation. Consequently, the breathing exercise, with the approach utilized, would presumably be acceptable in this population to increase pain tolerance. This result is congruent with the fact that breathing thought to be efficient in pain relieve because it diverts, a focus away from the pain. Breathing together with relaxation reduced pain perception (17). Furthermore, Lothian 2010 (18), supported the current finding as it was mentioned that conscious breathing and relaxation are important as well as evidence-based approaches to handle pain (as postpartum afterpains) not because it is a distraction only but also because controlled breathing, particularly slow, deep breathing, enhances oxygenation, relaxation, and body awareness. Focusing on breathing and relaxing blocks out other distractions and helps woman becomes more aware, more attentive, more alert, and more focused.

Unfortunately, similar research studies to the present study, investigating the effect of breathing exercise on postpartum after pains are exceptional. But this study was similar to another findings conducted but for laboring women indicating a significance difference between the mean pain scores of experimental group than control group which shows that the slow paced breathing initiated by the investigator was effective in reduction of pain during the first stage of labor (19, 20,21).

There were several breathing patterns and strict guidelines for “doing it right” but the “right” way to breathe is whatever feels right (22). Researchers go further as they assumed that; there are no rules related to the count of breaths per minute, or whether to make sounds with inhalation or not. The key here is that the breathing is deep taken from nose slowly exhaled from mouth, conscious and not automatic. Just slow, deep breathing is particularly effective. Fortunately this makes breathing as a simply issue during afterpains, easy to learn for postpartum women.

The researchers' hypothesis is derived from the gate-control theory of pain. It is a pain theory used to explain the neurophysiologic mechanism underlying the perception of pain: the capacity of nerve pathways to transmit pain is reduced or completely shut by using distraction techniques (23). The researches in the present study presumed controlled breathing as one of those destructions techniques.

Moreover, scientists had mentioned that using deep controlled breathing in everyday life, either to relieve stress or to increase body awareness and mindfulness, is excellent practice. It is an excellent life skill (24). Since, besides deep breathing activates the release of endorphins, which improves feelings of well-being and provides pain-relief (25); breathing exercises precisely have many benefits. When to take deep, slow breaths, body responds in many positive ways: muscles relax, as it's difficult to maintain a lot of physical tension when breathing properly (26). When breathe deeply and relaxed, oxygen delivery improves, fresh oxygen pours into every cell in the body. This increases the functionality of every system in the body. It will also be noticed improved mental concentration and physical strength (27). Another valuable advantage of deep breathing is that it lowers blood pressure, as muscles relax, blood vessels dilate and its measurements can return back to a normal level. At last but not the least, good breathing habits help the lymphatic system function properly; this encourages the clearness of harmful toxins and allows it to direct its energy to more productive functions (28). Generally, available studies have confirmed the effect of breathing exercises on anxiety relief among mothers (21, 29). However, the researchers in the current study resulted to its significant effect on increased tolerance of mothers and reduction of postpartum afterpains.

VI. Conclusion

It was concluded from the statistical tests that practicing breathing exercise was effective in reduction of the mean score of afterpains among postpartum women. Analysis of data showed that there was a significant difference between the intervention and non intervention group. Breathing exercise is the effective, simple and non-invasive method of choice to be used for those women.

Recommendations

- The breathing exercise which was taught and which was administered to the postpartum women; encouraged them to have more tolerance and reduced their mean score of afterpains.
- Further studies are necessary in order to conclude a causal association between deep, slow breathing exercise and afterpains among postpartum women in different samples and settings.

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