Effect of Reflexology and Nursing Management Protocol versus Hospital Routine Care on Pain and anxiety among Post Cesarean Section Primipara

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Abstract: Pain and anxiety are the most common complications after cesarean section. The use of medications is the most common strategy for alleviating these problems. However, the adverse effects of these drugs and lack of access to them for some patients, has led to an increase in application of non-drug methods such as foot reflexology. Purpose: to examine the effect of Nursing Management Protocol and Reflexology versus Hospital Routine Care on pain and anxiety among post cesarean section primipara. Research hypothesis: there is less pain and anxiety among post cesarean section primipara who have both nursing management protocol and reflexology than those who apply hospital routine care. Research Design: a randomized clinical trials design. Sample Size: A total of 60 participants were divided into two groups after gaining their acceptance. The study group received both Nursing Management Protocol and Reflexology, the control group received Hospital Routine Care. Setting: postpartum unit of the Teaching Hospital, and University Hospital at Menoufia Governorate. Instruments: a Structured Interview Questionnaire, Post cesarean section pain and anxiety level was measured using a NRS and SF-MPQ for pain and Spielberger questionnaire for anxiety before and after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery Method: Post cesarean section pain level and anxiety were measured four times using a subjective post cesarean section pain scales NRS and (SF-MPQ) for pain and Spielberger questionnaire for anxiety before and after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery. Findings: there were a highly statistically significant difference in the study group regarding pain scores after intervention at 2hrs, 6hrs, and 18hrs after delivery at P value (.001, .396) respectively but a statistically significant difference after intervention at 12hrs after delivery, while there was non statistically significant difference regarding pain scores before and after intervention at 2hrs, 6hrs, 12hrs, and 18hrs in the control group. It revealed that there was a highly statistically significant difference regarding total anxiety scores before and after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery in the study group. While, there was a statistically significant difference regarding total anxiety scores before and after intervention at 6hrs, 12hrs and 18 hrs after delivery, but non significant at 2hrs in control group. Conclusions: The study group, there was a highly statistically significant difference regarding pain scores after intervention only at 2hrs and 6hrs after delivery while highly statistically significant difference before and after intervention regarding total anxiety scores before and after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery. The control group, there was non statistically significant difference regarding pain scores after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery, while. While, there was a statistically significant difference regarding total anxiety scores before and after intervention at 6hrs, 12hrs and 18 hrs after delivery, but non significant at 2hrs after delivery. Recommendation: Foot Reflexology by a specialist should be added to the Nursing Management Protocol for management of postpartum pain and reduction of anxiety level.

Keywords: Nursing Management Protocol, Reflexology, Hospital routine Care, Post Cesarean Section Pain, Primipara, NRS and (SF-MPQ).

1. INTRODUCTION

Caesarean section is the use of surgery to deliver babies. A caesarean section is often necessary when a vaginal delivery would put the baby or mother at risk[1].

Cesarean section is a surgical procedure, which can affect the overall health of mothers and their babies. The main problems resulting from cesarean birth are postoperative pain and anxiety[21]. Physiological responses to pain include respiratory, cardiovascular, gastrointestinal, urogenital and metabolic changes, as well as endocrine and mood disorders. Anxiety after cesarean surgery might be due to fear of pain or concerns over losing sexual function, body image, return to the normal daily activities and even job[22].

Pain and anxiety are unpleasant conditions experienced during the postoperative period, which has been experienced by most women[23]. Effective relief of pain and anxiety can cause comfort, life quality improvement, faster return to everyday life, shorter hospital stays and lower costs[22]. Additionally, pain and anxiety can impair the mothers' ability to optimally care and breastfeed their infant in the postpartum period[24].

Pain management post cesarean section is necessary for mothers for medical reasons. Good pain relief improves mobility and woman's ability to breastfeed and care of her infant. It is necessary for pain relief to be safe, effective, not interfere with the mother's ability to move around and care for infant, and has no adverse neonatal effects while breast feeding[2].

Recently, many complementary therapies such as Music, Transcutaneous Electrical Nerve Stimulation (TENS), Massage, Relaxation and Reflexology are effective in managing post cesarean section pain and anxiety [3].

Reflexology is a massage, which uses finger pressure specific zones of the feet. It is easy to learn for patients to incorporate them into their treatments to achieve relaxation and reduces stress[4].

Reflexology emerges to be a practical therapy in the field of pain management. It is a restorative process of pain relief and health promotion via provoking feet's reflex points[5].

Foot reflexology stimulate the nerve fibers (A beta fibers). The foot dermato layer contains tactile and pressure receptors which are highly myelinated than the pain fibers where the receptors transmit the impulses to the central nervous system. The dorsal horn of the spinal cord will be activated through the inhibitory interneuron's, whereas the excitatory inter neurons are inhibited resulting in inhibition of T-cells functioning, then closing the gate. The pain signal is not transmitted to ascending system of neuron pathway to the brain and the brain does not receive the sensation of pain. Many study result shows that foot reflexology can use as a complimentary therapy to decrease the intensity of pain in post operative patients. Objective of this study is to assess The effectiveness of reflexology on pain and anxiety after cesarean section[23].

There are several pharmacological methods to control pain and anxiety, but in the recent years, several studies have been done on non-pharmacological methods of pain management due to their temporary effects and side effects of pharmacological methods such as benzodiazepine and analgesics[24]. Two of the widely accepted non-pharmacological methods are reflexology (a form of foot massage that targets points on the foot which are believed to correspond with body parts) and simple massage therapy[25].

One of the complementary therapy methods to reduce pain is foot and hand reflexology. Reflexology is a systematic and rhythmic form of touch, using certain manipulations of the soft tissues of the body in order to promote patients' comfort, well-being and pain relief. Foot and hand reflexology stimulates the nerve fibers to produce pain-relieving endorphins[24]. Since the highest concentration of pain receptors are in the hands and feet (each of the extremities has more than 7,000 nerve endings), foot and hand reflexology and neurons' stimulation may be a good technique for assuaging pain and anxiety after cesarean section[25].

Nursing management protocol included administer six essential elements of procedural pain management that have been demonstrated to reduce pain and distress associated with medical procedural. This involved planning, preparation, pharmacological, physical, psychological and promoting recovery and resilience[6].

While, Hospital Routine Care means medical treatment provided for pain management in hospital[7].

The purpose of the current study is to examine the effect of Reflexology and Nursing Management Protocol versus Hospital Routine Care on pain intensity and anxiety level among post cesarean section primipara**.**

Hypothesis: There is less pain and anxiety among post cesarean section primipara who undergo both nursing management protocol and reflexology than those who undergo hospital care only.

Significance of the Study

According to the Demographic and Health Survey reported that cesarean section rates in Egypt rose from 4.6% to 51.8% of women[20]. That rate is 3.5 times higher than it should be, considering the World Health Organization has set the target CS rate at 15 percent[21].

Post-cesarean section pain is characterized as acute, because it is related to the damage caused to the tissue due to the inflammatory reactions derived from a traumatic process. This pain interferes with other's daily activities, breastfeeding and routine baby care[10]. Anxiety is associated with postpartum mood disorder and is increased with cesarean section. Foot reflexology is a nursing intervention that can be used to reduce anxiety[24].

Thus, the current study has been conducted to examine the effect of nursing management protocol and reflexology versus hospital routine care on pain intensity and anxiety level among post cesarean section primipara as applied by trained nurse.

2. METHODS

1-**Research Design:** a randomized clinical trial.

2-**Research Setting**: this study was conducted at two setting were Menoufia University Hospital and Shibin El-Kom Teaching Hospital at Menoufia governorate.

3-Sampling: a convenient sample of 60 primipara were taken post cesarean section and selected from previous mentioned hospitals. The desired sample size was determined based on using power and sample size calculator after revising previous literature. Accordingly 60 primipara post cesarean section were recruited to the study and divided into two groups. The number of selected cases at Menoufia University Hospital was 33cases, while the number of selected cases at Teaching Hospital was 22 cases based on the statistical annual report 2018 of the previous mentioned hospitals.

First, the study group and control group were selected from women who received hospital routine care from previous mentioned hospitals. Subject assignment to different groups was done using block randomization method. Computer software was used to generate the list for block randomization.

Second, Selected women were monitored during fourth stage of labor, 6hrs, 12hrs and 18hrs post cesarean section and measured Post cesarean section pain level and anxiety four times using a subjective post cesarean section pain scales by using NRS and (SF-MPQ) for pain and Spielberger questionnaire for anxiety before and after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery. Categorized as both nursing management protocol and foot reflexology in the study group, hospital routine care in the control group.

Inclusion criteria:

1- Primipara post cesarean section.

2- Women with intact foot skin and free from any skin problems.

3- Women who didn't have medical problems & any severe post cesarean maternal complications.

Instruments: Throughout the course of the present study, four instruments were used as follow:

Instrument I: **A Constructed Interview Questionnaire**. It consisted of sociodemographic characteristics of women as name, age, education, occupation,….etc.

Instrument II: A Numerical Rating Scale. Each participant was asked to mark a spot on the line corresponding to the intensity of their pain at that particular time on a possible scale of 0 to 10. First, the subject rated verbally the intensity of pain ranging from "No pain" to " severe". Responses of participants were scored (0) means No pain, (1-3) means mild

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pain in which mother expressed verbally low level pain which comes to awareness only when attention paid to it, (4-6) means moderate pain in which mother expressed verbally pain exists but subject can continue performing all the tasks she would normally carry out and from (7-10) means severe pain, in which mother expressed verbally makes concentration difficulties, but allow her to perform task.

Instrument III: A Short form version of the McGill Pain Questionnaire (SF-MPQ): to describe the participant's sensation to pain before starting the study. Each subject was asked to choose the expression that described her pain from the list (Throbbing, Stabbing, Sharp, Burning, Aching, Heavy, Cutting).

Instrument IV: Spielberger Questionnaire: consisted of twenty items measured on scale ranged from (1to4). **1 indicated**: Not at all. **2 indicated:** Some what. **3 indicated**: Moderately So. **4 indicated**: Very Much So.

Procedure:

1- An approval was obtained from the ethical research and Hearing committee on Tuesday at 9/12/2014 in the Faculty of Nursing-Menoufia University, two formal letters were issued from the dean of Faculty of Nursing, Menoufia University to obtain an official approval from the directors of the hospitals to conduct the study. Three formal letters were issued from the Faculty of Nursing, Menoufia University to obtain an official approval from administrators of the hospital where data would be collected to conduct the study. The letters identified the researcher, the title of the study and the aim of the research. The purpose of the study was explained to each woman in the sample. The researcher approached each woman, giving her an overview of the study.

2- **The data collection instruments** were developed after review of past and current, local and international related literature including books, articles, periodical and magazines to get acquainted with various aspects of the research problem and to acquire the needed knowledge to conduct the study and prepare the necessary instruments.

3- **For validity assurance**, The validity of the instruments were ascertained by a group of subject area experts (one from Faculty of Medicine, two staff from Faculty of Nursing) who reviewed this part of the instruments for content and internal validity. They were also asked to judge the items for completeness and clarity (content validity). Suggestions were incorporated into these instruments.

4- **Test-retest reliability** was applied by the researcher for testing the internal consistency of each instrument. It was done through the administration of the same instrument to the same participants under similar conditions on two or more occasions. Scores from repeated testing were compared.

5- **Pilot study** was conducted to test the applicability of the instruments, the feasibility of the study and to estimate the time needed for data collection. It was conducted on 10% of the total sample (6 primipara women). On the basis of the pilot study results; the researcher rephrased some questions and sentences then set the final fieldwork schedule. So the subjects of pilot study not included in the study sample**.**

6- **For Ethical considerations**: Each woman assigned a written informed consent to participate in the present study before inclusion in the study sample. She was also informed that participation in the study was totally voluntary, also she could withdraw from the study whenever she decides. Total confidentiality of the obtained information as well as respect of the subject′s privacy was ensured. No harm for participants.

7- **Data collection**: Data was collected over a period of six months starting from July 2017 to December 2017.

8- **Study Maneuvers**:

The researcher interviewed all participants before the first intervention immediately after cesarean section to construct the initial assessment and collected the data related to sciodemographic characteristics, Mother's sensation regarding pain immediately post cesarean section. Assess pain intensity and mean score of anxiety before and after intervention (both foot reflexology and nursing management protocol or post cesarean section hospital routine care) at the 1st 2hrs, 6hrs, 12hrs and 18hrs after delivery.

Nursing management protocol involved review medical history, physical exam, and laboratory and diagnostic tests in order to understand sequence of events contributing to pain. Assess present pain, including intensity, character, frequency, pattern, location, duration, and precipitating and relieving factors. Assess pain regularly and frequently, but at least every 4 hours. Monitor pain intensity after giving medications to evaluate effectiveness.

While, Reflexology involved the application of pressure to person's feet in order to affect physical change to the body. Placement of pressure is based on system of zones and reflex areas that correspond to other parts of the body**.**

Reflex zone therapy for treatment of post cesarean section pain divided into general and specific treatment; General treatment of the whole body by rolling the two feet on specifically designed long, wooden or plastic roller for 20 minutes.

Specific treatment incorporated an applied pressure for the representation of female genital organs on feet including a band around the front of ankle. The reflexology technique was conducted according to the following steps:

•The mother's foot was elevated by supporting it with a pillow. The sole was spread and rubbed by the researcher's fingers.

•The thumb was used to make circles over the entire sole of the foot. Then the researcher rubbed the sole with an up-and-down motion.

•The heel and ankle was pressed between the researcher's thumb and forefinger. This is done to lukewarm the skin of the foot generating rest and increasing blood flood.

•The mentioned kneading was applied to each foot for 10 minutes, then reflexology is done through acupressure, applying the Proper amount of pressure to the sphere of the foot, on the following points;

Two Yin Crossing: This point is situated three inches widths over the ankle. Pressing this point assists in overall healing of disorders related to the lower abdomen.

Great Rushing: This point is positioned in the girdle between the large and the second toes. Stimulating this spot aids in reducing abdominal pain.•The pillow support was removed to finish the massage. Using (SF-MPQ) and (NRS) to assess

pain intensity for the study and control groups two times: once before applying the session and the 2nd time immediately after it at the first 2hrs, 6hrs, 12hrs & 18hrs after delivery.

While, the control group received hospital routine care only including administration of analgesic as Ketolac amp/12hrs for 48hrs and Profined suppository if needed.

Evaluative Phase: Evaluation of the implementations phase was accomplished by determining the pain scale and mean score of anxiety level before and after intervention (both nursing management protocol and foot reflexology) versus (hospital routine care) started within the first two hours immediately postpartum and continued every 6hrs up to 18 hrs in the first postpartum day.

Data analysis:

Upon completion of data collection, each answered sheet was coded and scored. The researcher coded the data into a coding sheet so that data could be prepared for computer use. The data collected were tabulated & analyzed by SPSS (Statistical Package for The Social Science Software) statistical package version 20 on IBM compatible computer. Qualitative data were expressed as number and percent (No&%) and analyzed by applying chi-square test. Qualitative data one cell of table has expected number less than 5 fisher's exact test was applied. Level of significance was set as P value <0.05for all statistical tests.

3. RESULTS

Regarding Socio-demographic Characteristics of the Study and Control Groups, there was no statistically significant difference regarding Socio-demographic Characteristics of the Study and Control Groups, Their age ranged from20-35 years with nearly three quarter of the total sample were rural residence and nearly half of the total sample were university education. , table,(1) .

Table (1) : Socio-demographic Characteristics of the Study and Control Groups

Variables	Study		Control		χ^2	P –value
	No	%	No	%		
Maternal Age						
from 20-25 years	9	30.0%	11	36.7%		
from 26-30 years	20	66.7%	16	53.3%	5.16 [ns]	.271
from 31-35 years	1	3.3%	3	10.0%		>0.05
Residence						
Urban	9	30.0%	14	46.7%	3.90 [ns]	.142
						>0.05
Rural	21	70.0%	16	53.3%		
Level Of Education						
Read and write	7	23.3%	6	20.0%		
Secondary school	8	26.7%	6	20.0%	2.10 [ns]	.716
						>0.05
University school	15	50.0%	18	60.0%	**No statistics computed**	

Regarding pain sensation immediately post cesarean section using Modified McGill Pain Questionnaire Short Form ,there was no statistically significant difference regarding total samples' pain sensation immediately post cesarean section with nearly one sixth of the total sample had pain as burning, heavy, and cutting sensation, table,(2) .

Table (2). Total Samples' Sensation Pain Immediately Post Cesarean Section Using Modified McGill Pain Questionnaire Short Form

Variables	Study		Control		χ^2	P – value
	No	%	No	%		
Mother's sensation regarding pain immediately post cesarean section					10.11 [ns]	.605
Throbbing	3	10.0%	3	10.0%		
Stabbing	7	23.3%	6	20.0%		
Sharp	4	13.3%	6	20.0%		
Burning	5	16.7%	3	10.0%		
Aching	3	10.0%	2	6.7%		
Heavy	3	10.0%	5	16.7%		
Cutting	5	16.7%	5	16.7%		

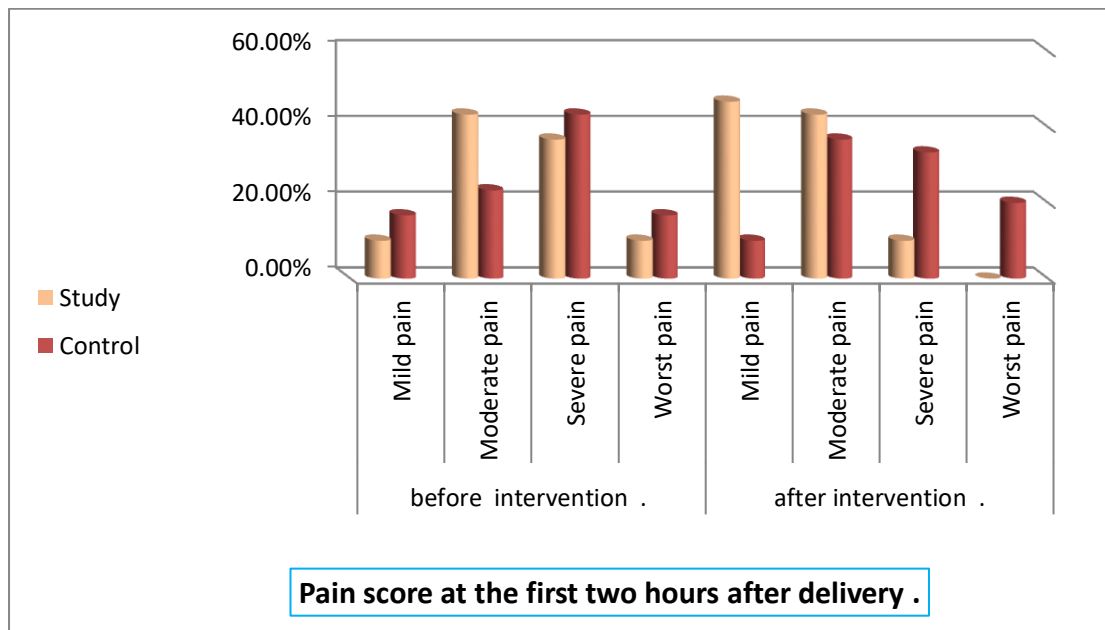**Pain score at the first two hours after delivery .**

Fig. (1). Comparison of Pain Scores before and after intervention at 2hrs after delivery for the total sample (60 participants) as assessed by using Numerical rating scale .

But, there was a highly statistically significant difference regarding pain scores at 6 hrs after delivery before and after intervention in the study group (P value:,000). While, there was a non statistically significant difference regarding pain scores at 6 hrs after delivery before and after intervention in the control group, table (3).

Table (3). Comparison of Pain Scores before and after intervention at 6 hrs after   delivery of the total sample (60 participants) as assessed by using Numerical rating scale.

Variables		Study		Control	
		No	%	No	%
Pain score at the first six hours after delivery before intervention. .n	**Moderate pain**	9	30.0%	5	16.7%
	Severe pain	13	43.3%	15	50.0%
	Worst pain	8	26.7%	10	33.3%
Pain score at the first six hours after delivery after intervention. .	**No pain**	2	6.7%	0	.0%
	Mild pain	13	43.3%	0	.0%
	Moderate pain	7	23.3%	7	23.3%
	Severe pain	7	23.3%	18	60.0%
$\chi 21$		**22.49****		**2.27 ns**	
p-value1		**.000**		**.321**	

(**) Highly statistically significant difference.

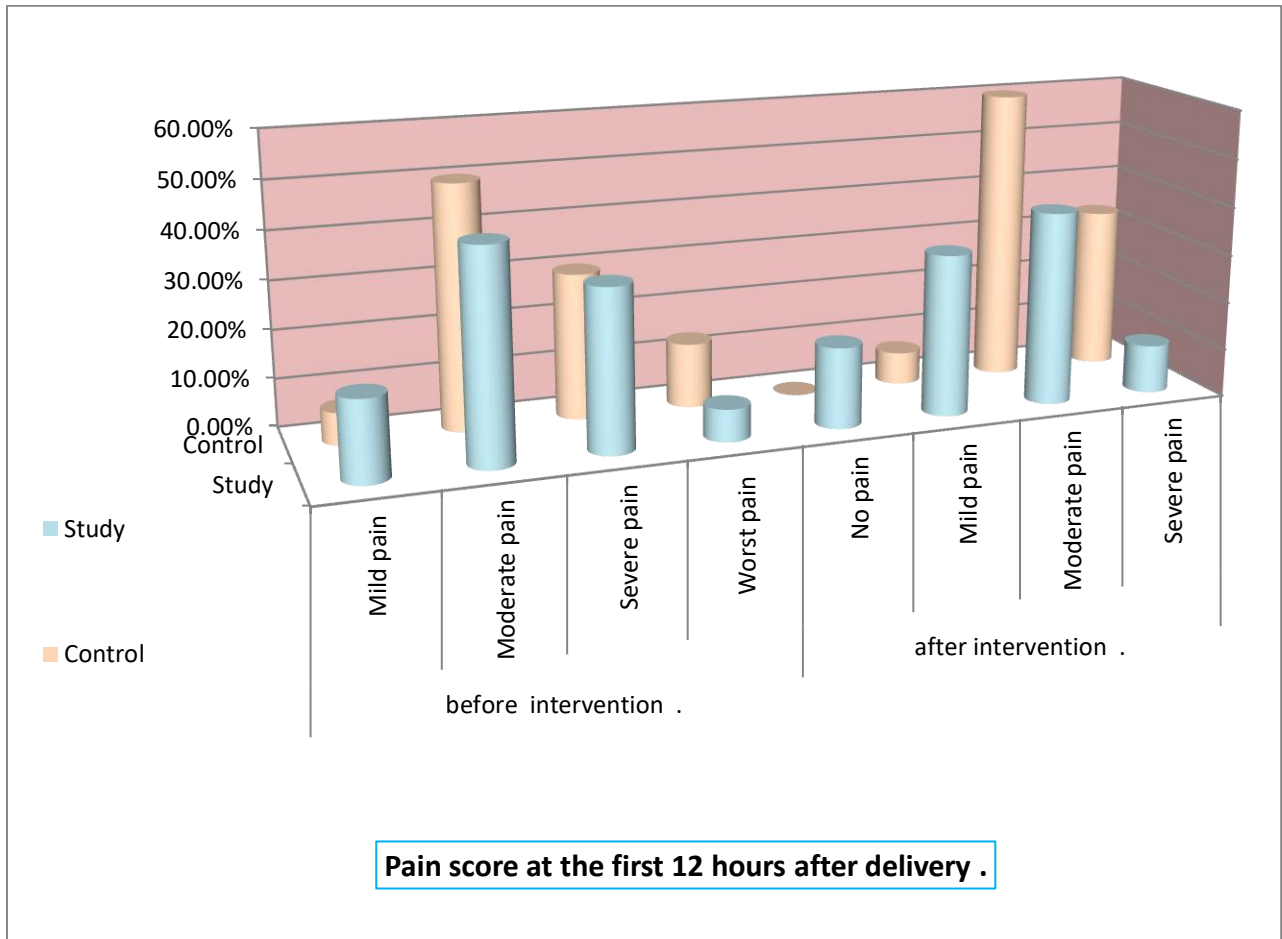**(ns) No statistically significant difference**

Fig.(2). Comparison of Pain Scores before and after intervention at 12 hrs after delivery of the total sample (60 participants) as assessed by using Numerical rating scale.
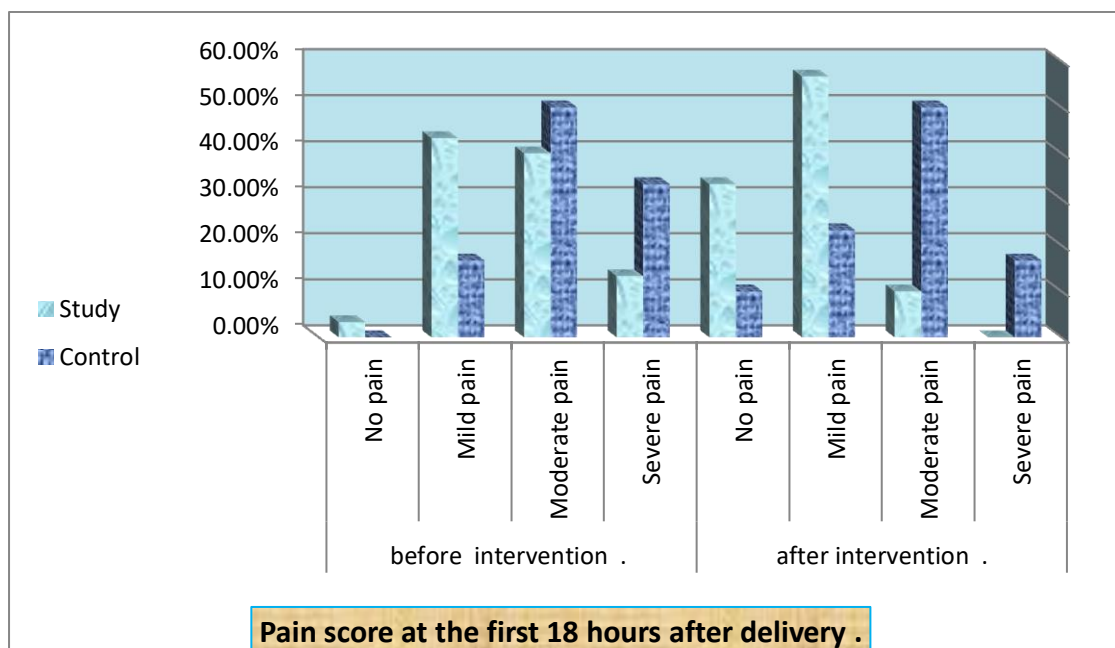

Fig. (3) Comparison of Pain Scores before and after intervention at 18 hrs after delivery of the total sample(60 participants) as assessed by using Numerical rating scale

The comparison of Mean score of total anxiety at the first two, six, twelve and eighteen hours after delivery for the study, and control groups on pre and post intervention. It revealed that there was a highly statistically significant difference regarding total anxiety scores before and after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery in the study group. While, there was a statistically significant difference regarding total anxiety scores before and after intervention at 6hrs, 12hrs and 18 hrs after delivery, but non significant at 2hrs in control group, table (4).

Table(4):Mean score of total anxiety at the first two, six, twelve and eighteen hours after delivery for study, and control groups on pre and post intervention.

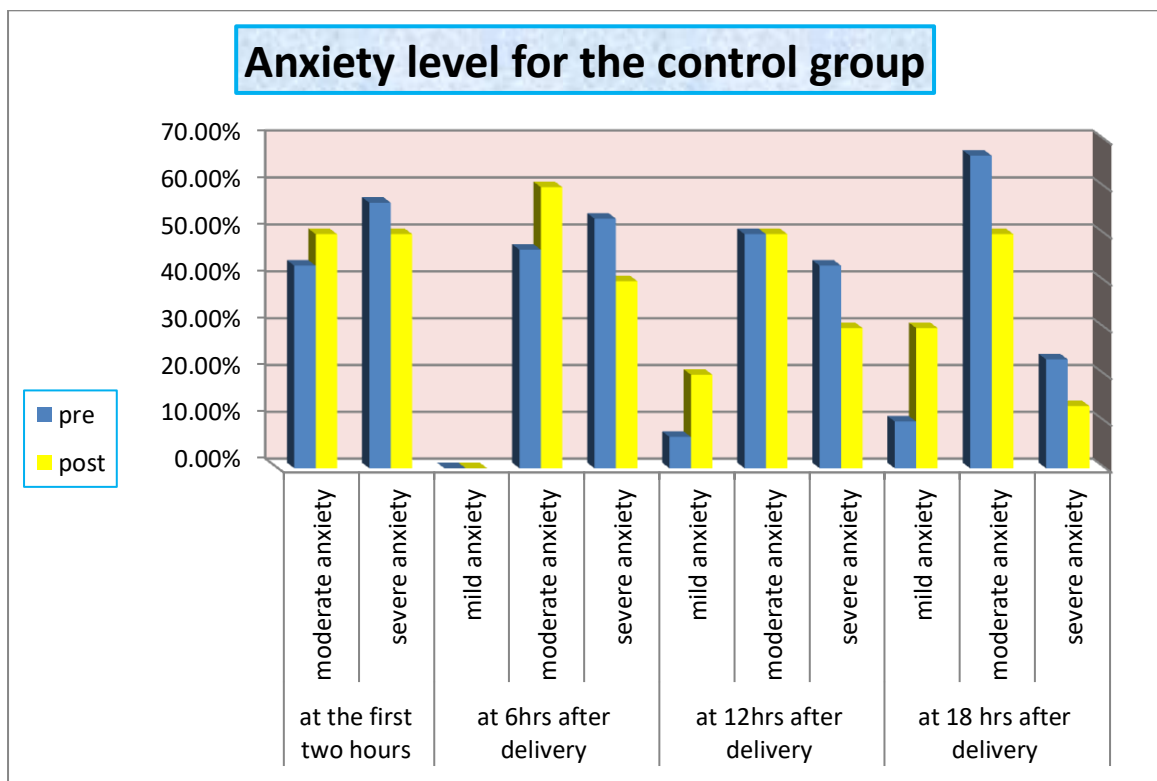| Items	Study		Control	
	Pre *Mean ± SD*	Post *Mean ± SD*	Pre *Mean ± SD*	Post *Mean ± SD*
At the first two hours after delivery	61.33 ± 10.7	55.27 ±9.6	58.37 ±9.5	59.17 ±*11.1*
T-test P-value1	**3.159** **.004**		-.578- .568	
At 6hrs after delivery	56.03 ±9.2	53.93 ±9.6	59.50 ±*11.3*	58.70 ±9.8
T-test P-value1	**2.075** **.047**		**1.128** **.052**	
At 12hrs after delivery	51.10 ±2.8	45.77 ±3.5	54.50 ±8.5	52.77 ±5.1
T-test P-value1	**2.952** **.006**		**2.324** **.027**	
At 18 hrs after intervention	43.03 ±3.5	38.93 ± 3.2	50.00 ±5.1	46.53 ±4.7
$\chi^2 1$ p-value1	**3.191** **.003**		**2.121** **.043**	

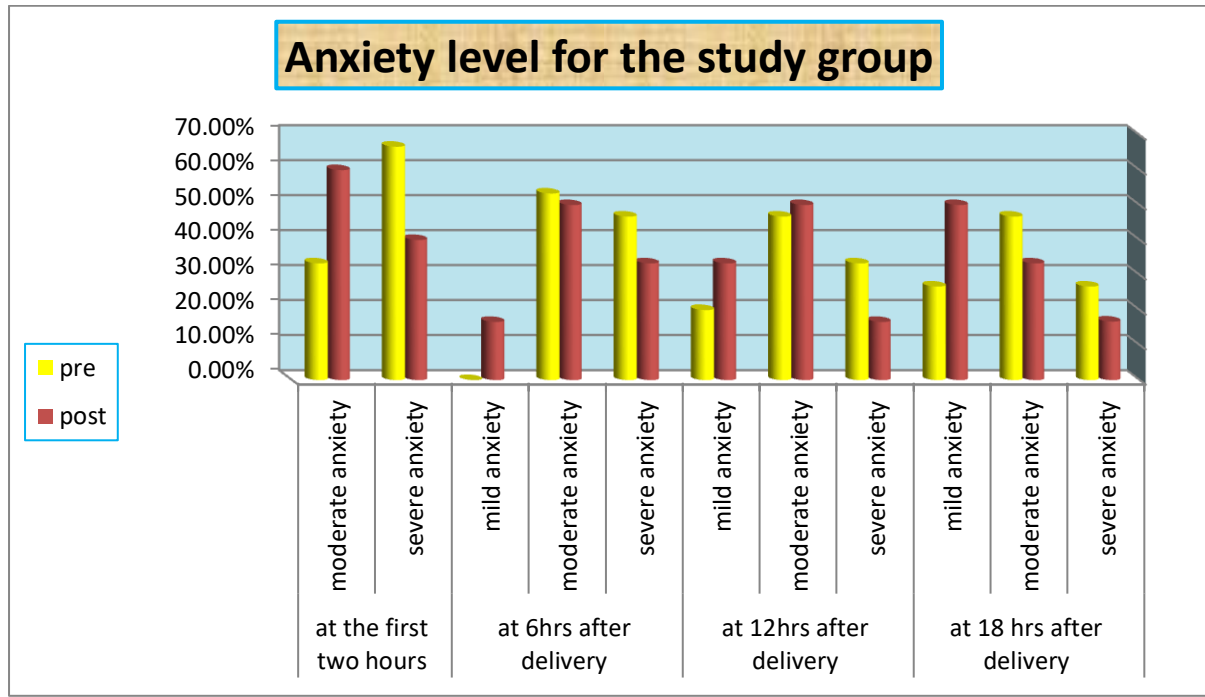**Fig.(4) Anxiety Level of The Control Group**

Fig. (5) Anxiety Level of The study Group

4. DISCUSSION

Regarding pain scores after cesarean section, our study's results illustrated that there was a highly statistically significant difference regarding pain scores at 2hrs, 6hrs and 18hrs after intervention in the study group (both foot reflexology and nursing management protocol). While, there was a statistically significant difference regarding pain score at 12hrs after intervention. Meanwhile, there was no statistically significant difference regarding pain scores at the 1st 2hrs, 6hrs, 12hrs and 18hrs before intervention. That means that foot reflexology when added to nursing management protocol provided better relief of pain than without it.

These results can be explained through the effect of Massage in stimulating large nerve fibers and layers of dermatomes that contain tactile receptors and pressure. The receptor then sends nerve impulses to the central nervous system. The gate control system on the dorsal horn is activated through an inhibitory interneuron, thus closing the gate then the brain does not receive a message of pain[8]. Besides, gentle suppression of the hands and feet can stimulate endorphin hormone which gives a relaxing effect on the body[9].

The current study, as well as many others, indicates that effective post-operative pain control can be achieved through foot reflexology.

It was supported by some studies conducted by **Baby & Babu, (2014)[11]** who investigated the effectiveness of music therapy versus foot reflexology on pain among postoperative patients and reported that foot reflexology was more effective than the music therapy.

The current finding also matches with the study of **Irani et al (2015)[12]** on "The effect of Reflexology on Post-Cesarean Pain and Anxiety" Which demonstrated that the mean score of pain and anxiety in the two groups were not significantly different before the intervention, while after the intervention the mean score of pain showed a significant difference and decreased among intervention group immediately, 60 and 90 minutes after the intervention.

Furthermore, the present finding agrees with the study of **Jipi, (2014)[13]** who conducted A Randomized Control Trial to Determine the Effect of Foot Reflexology on Intensity of Pain and Quality of Sleep in Post Caesarean Mothers and noticed a statistically meaningful distinction between pain intensity scores before and after foot reflexology which means that the researchers' hypothesis was conventional; mothers who receive foot reflexology show decreased post-cesarean pain intensity than who do not receive the intervention.

This is in line with **Bhagya, (2017)** [14] who conducted Foot reflexology: Effect on pain and anxiety in postoperative patient. Where the researcher found that foot reflexology is an efficient non-pharmacological nursing intervention used for pain management in post-operative patients.

The current finding relatively matches with the study of **El- Shehata et al (2016)**[15] on the Effect of foot massage on pain level among patients after abdominal surgery which revealed that there was a statistically significant decrease of subjective pain score among the study group rather than the control group after interference.

The present finding also relatively agrees with the study of **Kaur et al, (2013)**[16] on Effectiveness of Hand-Foot massage on the post operative pain among Open Heart Surgery Patients: A Randomised Control Trial, that revealed a decreased pain scores based on numerical pain scale and observational checklist for behavioral response to pain. Thus it disguised that foot reflexology is effective in the diminution of post operative pain.

Adding up, the present finding is congruent with the study carried out by **Sadizaker, (2011)**[17] who examined The effect of foot and hand massage on postoperative cardiac surgery pain and indicated significant differentiation in pain intensity between the control and the intervention group.

But, Regarding pain scores after intervention, the results of the current study highlighted a non statistically significant difference among group(3) (hospital routine care only). As postoperative pain relief and satisfaction were still inadequate in some patients because of individual variability and limitation from side effects of analgesic drugs or technique.

The results of the current study were ascertained **by Ismail et al, (2012)** [19] who conducted observational study to assess the effectiveness of postoperative pain management of patients undergoing elective cesarean section. Their results reported that the regime for postoperative pain management was mostly started and followed by the obstetric team at the hospital. Although the postoperative pain management was adequate in terms of patients' safety, it was not effective according to the goal set by Joint Commission on Accreditation of uniformly low pain score of not more than 3 out of 10 both at rest and with movement.

It was also in line with **Villar et al., (2006)** [20] who conducted surveys to assess caesarean delivery rates and pregnancy outcomes. Their results had shown that parturient consider pain during and after cesarean section as their most important concern. Despite advances in postoperative pain management, postoperative pain relief and satisfaction were still inadequate in some patients because of individual variability and limitation from side effects of analgesic drugs or techniques.

Regarding anxiety level after intervention at 2hrs, 6hrs, 12hrs, and 18hrs after delivery, there was a highly statistically significant difference among study group. The use of foot reflexology was effective in reducing anxiety. Nurses should use this non-pharmacologic method to control the symptoms of anxiety among mothers.

The results of the current study were ascertained by **Bastani et al., (2015)**[27] who reported that After the interventions, the mean score of anxiety was significantly lower in the reflexology and placebo groups than the control group (P<0.001). There was no significant difference between the reflexology and placebo groups in terms of the mean scores of anxiety (P>0.05). Comparing the mean score of anxiety between the reflexology (14.7±7.2) and placebo (9.4±8.5) groups indicated that the reflexology intervention was more effective in reducing anxiety.

Also the researcher's point of view was ascertained by **Irani et al., (2015)**[15] who showed that there was no significant difference between the two groups concerning their levels of pain and anxiety before the massage (P>0.05). However, the levels of pain and anxiety significantly decreased in the intervention group, immediately, 60 and 90minutes after the intervention (P<0.001).

Also the researcher's point of view was ascertained by **Ray et al., (2017)**[28] who reported that there was significant difference in the mean of state anxiety scores in three metatarsus, ankle reflexology massage and control groups in the first day of intervention.

The results of the current study in contrary with **Nastaran et al., (2012)**[29] who reported that there was no statistically significant difference in pain intensity before intervention between two groups by using t-test (p=0.814), but after intervention, the difference was significant by Man-Whitney test (p=0.004). There was not statistically significant difference between two groups regarding postoperative anxiety score (p=0.215).

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5. CONCLUSIONS

According to the results of the current study, the present study concluded that there was no statistically significant difference regarding pain score before intervention among three groups. But after intervention at 2hrs, 6hrs, 12hrs, and 18hrs after delivery. The study groups showed statistically significant difference as follow:

The study group, there was a highly statistically significant difference regarding pain scores after intervention only at 2hrs and 6hrs after delivery while highly statistically significant difference before and after intervention regarding total anxiety scores before and after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery.

The control group, there was non statistically significant difference regarding pain scores after intervention at 2hrs, 6hrs, 12hrs and 18hrs after delivery, while. While, there was a statistically significant difference regarding total anxiety scores before and after intervention at 6hrs, 12hrs and 18 hrs after delivery, but non significant at 2hrs after delivery.

6. RECOMMENDATIONS

In light of the study's findings the following recommendations were proposed:

1-Encourage women to use non-pharmacological methods as foot reflexology to help them cope with postpartum pain and mood disorder as anxiety without any side effects and no safety precautions.

2-Reflexology could be added to nursing management protocol and advocated as a non-pharmacological approach for management of post-cesarean pain and reduction of anxiety.

3-Nursing Management Protocol and Reflexology could be recommended in hospital protocols for management of post-cesarean pain and promotion of anxiety level.

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