

**Journal of International  
Academic Research for Multidisciplinary**



**A Global Society for Multidisciplinary Research**

# Editorial Board

---

Dr. Kari Jabbour, Ph.D  
Curriculum Developer,  
American College of Technology,  
Missouri, USA.

Er.Chandramohan, M.S  
System Specialist - OGP  
ABB Australia Pvt. Ltd., Australia.

Dr. S.K. Singh  
Chief Scientist  
Advanced Materials Technology Department  
Institute of Minerals & Materials Technology  
Bhubaneswar, India

PROF. Dr. Sharath Babu,LLM Ph.D  
Dean. Faculty Of Law,  
Karnatak University Dharwad,  
Karnataka, India

Dr.S.M Kadri, MBBS, MPH/ICHHD,  
FFP Fellow, Public Health Foundation of India  
Epidemiologist Division of Epidemiology and Public Health,  
Kashmir, India

Dr.Bhumika Talwar, BDS  
Research Officer  
State Institute of Health & Family Welfare  
Jaipur, India

Dr. Tej Pratap Mall Ph.D  
Head, Postgraduate Department of Botany,  
Kisan P.G. College, Bahraich, India.

Dr. Arup Kanti Konar, Ph.D  
Associate Professor of Economics Achhruram,  
Memorial College,  
SKB University, Jhalda,Purulia,  
West Bengal. India

Dr. S.Raja Ph.D  
Research Associate,  
Madras Research Center of CMFR ,  
Indian Council of Agricultural Research,  
Chennai, India

Dr. Vijay Pithadia, Ph.D,  
Director - Sri Aurobindo Institute of Management  
Rajkot, India.

Er. R. Bhuvanewari Devi M.Tech, MCIHT  
Highway Engineer, Infrastructure,  
Ramboll, Abu Dhabi, UAE

Sanda Maican, Ph.D.  
Senior Researcher,  
Department of Ecology, Taxonomy and Nature Conservation  
Institute of Biology of the Romanian Academy,  
Bucharest, ROMANIA

Dr. Jake M. Laguador  
Director, Research and Statistics Center,  
Lyceum of the Philippines University,  
Philippines.

Dr.Damarla Bala Venkata Ramana  
Senior Scientist  
Central Research Institute for Dryland Agriculture (CRIDA)  
Hyderabad, A.P, India

PROF. Dr.S.V.Kshirsagar, M.B.B.S,  
M.S Head - Department of Anatomy,  
Bidar Institute of Medical Sciences,  
Karnataka, India.

DR ASIFA NAZIR, M.B.B.S, MD,  
Assistant Professor, Dept of Microbiology  
Government Medical College, Srinagar, India.

Dr.AmitaPuri, Ph.D  
Officiating Principal  
Army Inst. Of Education  
New Delhi, India

Dr. Shobana Nelasco Ph.D  
Associate Professor,  
Fellow of Indian Council of Social Science  
Research (On Deputation ),  
Department of Economics,  
Bharathidasan University, Trichirappalli. India

M. Suresh Kumar, PHD  
Assistant Manager,  
Godrej Security Solution,  
India.

Dr.T.Chandrasekarayya,Ph.D  
Assistant Professor,  
Dept Of Population Studies & Social Work,  
S.V.University, Tirupati, India.

## EFFECT OF FOOT MASSAGE ON RELIEVING MOTHER'S POST CESAREAN SECTION INCISIONAL PAIN

**DR.ABD ELHALEEM, S\***  
**DR. SOAD, A. RAMADAN\*\***  
**HEBA, A. EL KADER\*\*\***  
**AMAL, S. TAHA\*\*\*\***

\* Nursing Faculty, Maternal and Neonatal Health Nursing Department, Benha University, Egypt

\*\*Nursing Faculty, Maternal and Neonatal Health Nursing Department, Benha University, Egypt

\*\*\* Nursing Faculty, Medical and Surgical Nursing Department, Benha University, Egypt

\*\*\*\* Nursing Faculty, Medical and Surgical Nursing Department, Benha University, Egypt

---

### ABSTRACT

**Objective:** To assess the effect of foot massage on relieving mother's post cesarean section incisional pain. **Hypothesis:** Was foot massage had a significant effect on relieving post cesarean section incisional pain? **Design:** An intervention study was followed. **Settings:** The study was conducted in the cesarean section postnatal rooms at Benha University Maternity hospitals. **Sample:** It was involved 148 mothers, divided into 74 mothers as control group that received post cesarean section hospital routine care for pain relief and 74 mothers as intervention group that received 10 minutes foot massage for pain relief every 6 hours, 12 hours, and 18 hours. **Sample type:** A convenience sample type. **Tools of Data collection included:** structured interviewing questionnaire, modified McGill pain questionnaire short form and likert Scale. **Results:** There was significant relieving of pain level among intervention group compared to control group at different assessment times ( $p < 0.001$ ). Findings indicated that, the most cited description of pain among the study group mothers were fearful, tender, heavy and stabbing pain. While, the most prominent factors that aggravating pain were sitting, walking and carrying of the newborn. Also, more than half of subjects among control and less than half of intervention groups reported that, they had information about post cesarean section incisional pain relief measures. There was better satisfaction among mothers in the intervention group regarding post cesarean section pain relief measures than among the control group subjects. **Recommendations:** Designing health education training program for nurses about foot massage because it is an inexpensive pain relief measure, with no harm to mothers. In addition, there is need for further studies in this area also studies to investigate the health team attitude regarding this method.

**KEY WORDS:** Foot, Massage, Cesarean Section, Incisional Pain, Satisfaction

## INTRODUCTION

Cesarean section (C.S) is the birth of fetus through a trans-abdominal incision in the uterus. It is one of most common surgical procedure worldwide. It has played a major role in lowering both maternal and perinatal morbidity and mortality rates during the past century. The initial purpose of the operation was to preserve the life of the mother with obstructed labor and her newborn<sup>(1)</sup>.

Cesarean section is a prevalent operation that accounted for up to 32% of deliveries in the United States in 2007<sup>(2)</sup>. In Egypt, a significant rise in C.S deliveries occurred for all births. Hospital based C.S increasing to 22% in 1999-2000<sup>(3)</sup>. In Maternity Hospital of Benha University, cesarean delivery rate is accounting 60% of all deliveries<sup>(4)</sup>.

Moreover, there are various classifications that indicate of cesarean section as absolute or relative, common or uncommon, maternal and fetal. The absolute indication includes sever cephalopelvic disproportion, major degree of placenta previa, cancer cervix, vaginal atresia, transverse lie. Types of C.S are elective and emergency Cesarean section. Types of Cesarean incision are classic (vertical) incision and low segment (transverse) incision<sup>(5)</sup>.

Additionally, pain management post Cesarean section is necessary for mothers and medical reasons. Good pain relief improves mobility and woman's ability to breastfeed and care for her infant. Opioid drugs are routinely administered for post Cesarean section pain but it has the common side effects of dizziness, drowsiness, headache, nausea, insomnia, vomiting and weakness. And there is concern for opioid transmission to the neonate through breastfeeding, so the reduction of opioid use is desirable<sup>(6)</sup>.

Moreover, post cesarean section incisional pain is defined as an unpleasant sensory and emotional experiencing arising from actual or potential tissue damage. Pain includes not only the perception of an uncomfortable stimulus but also the response to that perception<sup>(7)</sup>. Moreover, types of pain can be divided into acute pain and chronic pain. Acute pain is experienced immediately after surgery (up to 7 days) and pain which lasts more than 3 months after the injury is considered to be chronic pain. Acute and chronic pain can arise from cutaneous, deep somatic or visceral structures<sup>(8)</sup>.

In advanced health care services, massage has taken an essential role. It has been shown importance to reduce stress, improve blood circulation, decrease pain, enhance sleep, reduce swelling, promote relaxation, decrease doses of analgesics and increase oxygen capacity of the blood. Foot Massage has also been recognized as a non-drug treatment for postoperative pain<sup>(9)</sup>. The ankle and foot consist of 34 joints, with many joint and reflex patterns. The nerve distribution to the feet is extensive. The position of the joint mechanoreceptors is through the central nervous

system. The sensory and motor centers of the brain contributed a large area to the foot. The feet often are easy place to begin a massage for a woman who is nervous or in pain. Massage of the foot is one of the best ways to enhance a high degree of nervous system input for relaxation and relief pain<sup>(10)</sup>.

Additionally, many studies proved that, foot massage stimulates the parasympathetic nervous system, resulting in relaxation and reduction in pain via a neural gating mechanism and an increase in body awareness. The gate control theory of pain states that a gate or a series of gates exists throughout the length of the spinal cord. Pain messages that originate from the periphery travel to the gate in the spinal cord. If the gate is open, then pain messages get through to the brain, if the gate is closed, then the brain does not receive the pain messages<sup>(11)</sup>.

Women undergoing Cesarean section who have a high pain levels are in special need of attention and care because of a higher risk of decreased ability to breastfeed and to take care of their newborn. In his study<sup>(12)</sup> he added that, persistent pain is more common one year after cesarean section and the women with persistent pain recalled significantly more pain on the day after cesarean section. Also rates of chronic pain after cesarean section have been between 6% and 18%<sup>(13)</sup>.

The nurse who plays a role in the medical pain management she must be aware about their pharmacological effects and side effects. Post cesarean section sedation and pain scores throughout treatment and for at least 2 hours after treatment is recommended. Foot massage is a pain relief, reached easily, in-expensive and has no harmful on mothers. For example massage involves gentle application of touch and movement to muscles, tendons, and ligaments blocks pain impulse perception and helps relaxation of muscles<sup>(10)</sup>.

### **Significance of the study:**

According to the USA national survey pain was the most frequently identified postpartum problem among Cesarean section mothers, 33% described the problem as major in the first tow months after birth<sup>(14)</sup>. Massage is one of the most widely used as complimentary therapy in nursing practices. Foot massages have the potential to aid pain relief<sup>(15)</sup>. So, this study was conducted to assess the effect of foot massage, as non-pharmacological pain relief measure, on relieving post Cesarean section incisional pain which was not utilized before in Benha Maternity University Hospital. Egypt is a developed country with limited resources and facilities so inexpensive measures for pain relieve are recommended. No previous studies were conducted at the Maternity of Benha Hospital to discuss the effect of foot massage on post Cesarean section incisional pain.

**Aim of the study:**

The aim of this study was to assess the effect of foot massage on relieving post Cesarean section incisional pain.

**Research Hypothesis:**

Is foot massage has a significant effect on relieving post cesarean section incisional pain?

**Subjects and methods:**

**Settings of the study:** The study was conducted in the Cesarean section postnatal rooms at Benha University Maternity Hospitals from November 2013 to April 2013.

**Study Design:** Intervention study was followed.

**Study subject:** Post Cesarean section mothers were selected according to the following criteria:

The criteria of inclusion were mothers who agree to participate in the study and those who were conscious. The excluding criteria included the following: Mothers who has foot damaged tissues, arthritis, phlebitis, burn wound, injures, inflammation, and eczema.

**Sample type:** A convenience sample.

**Sample size:** 148 mothers divided into two groups, 74 control and 74 intervention groups.

**Technique:** The researcher was visited the study setting until the predetermined sample size was obtained. The first mother who attends the post cesarean section room was selected according the sample criteria. The other mother was selected every third one to give the researcher chance to complete the massage session. The researcher was recruited 2 mothers per day and worked individually with each one. Firstly, the control group was selected according to the previously mentioned sample criteria. Secondly, the intervention group was chosen according to the previously mentioned sample criteria. Foot massage was conducted for 10 minutes post cesarean section every 6 hours, 12 hours, and 18 hours.

**Data collection tools:****1-A structured Interviewing Questionnaire:**

It includes section for collection of general characteristics data of the study sample and section for assessment of mother's knowledge about pain relief measures post Cesarean section.

**2- Modified McGill Pain Questionnaire Short form** to measure pain characteristics. This tool is consists of two parts:

Part (I) sensory pain descriptors are including 11 words that measures sensory pain each as throbbing, stabbing/sharp.

Part (II) affective pain descriptors are consisting of words that measure the affective pain such as tiring/exhausting.

**3- Likert Scale:** It was used to assess mothers' satisfaction towards pain management at 18 hour post cesarean section. The scale scores as follows: satisfied = 2, slightly satisfied = 1 and dissatisfied = 0.

**Pilot study:**

A pilot study was carried out before starting the data collection. This was done on 15 mothers with the same sample criteria to evaluate the content validity of tools used. This group of women was excluded from the study sample.

**Ethical Consideration:**

- After explanation the purpose of the study, a written consent was obtained from Cesarean section mothers to participate in the study.
- Questionnaire did not include any immoral statement that contradicts the Egyptian culture, beliefs, customs, tradition, and religion.
- Questionnaire did not touch mother's dignity.
- Insuring the confidentiality of the study data and the interviewing sheets' information.

**Technique of foot massage:**

The researcher was applied the massage without using any special equipment, which includes petrissage, kneading, and friction applied to the mother's foot using classical massage techniques. Petrissage is the movement of the balls of the fingers and thumbs to apply direct pressure in a slow and rhythmic fashion to the soft tissue underlying the skin of the foot. Kneading is very similar in action to wringing and usually follows in sequence.

Compression on the muscle was achieved by altering the direction in which the foot. Friction was used only on small areas and it was applied by pressing with small circular movements using the pad of the fingers.

**Massage steps:**

The mother was placed on a comfortable table and in an unconstrained position. The mother was asked to avoid talking during the massage unless necessary. The mother's foot was elevated by supporting it with 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. The heel and ankle was kneaded between the researcher's thumb and forefingers.

**Limitation of the study**

Five mothers were refused to complete participation in the study because they were exhausted and they were wanted to sleep. Another five mothers who were fulfilling the study criteria were recruited to complete the study sample size. Crying and breast-feeding of baby were interrupting the massage process in some cases.

**Results:**

Table (1) shows that, there was a significant improvement of mother's correct knowledge about the measures of pain relievers post intervention ( $p=0.004$ ), while it shows that, there was no significant difference in the sources of information about the measures of pain relievers between the two groups. On the other hand, there was a highly significant difference between two groups regarding the methods of pain relievers ( $p<0.001$ ).

**Table (2)** shows that, there was a statistically significant difference in means of pain level among study groups at 6, 12, 18 hours after delivery ( $p<0.001$ ). The means of pain level were ( $5.44\pm1.9$ ,  $4.37\pm1.84$ ,  $2.52\pm1.4$  respectively) in control group versus ( $3.09\pm1.55$ ,  $2.05\pm1.17$ ,  $1.84\pm1.10$  respectively) in intervention group after foot massage.

**Table (3)** shows that, there were different observations of mother's behaviors such as crying, restlessness, and moaning that were experienced by mothers during their pain. There was no significant differences between the two groups except for immobilization ( $p=0.043$ ).

**Table (4)** shows that, there was statistical significant difference between the two groups only regarding carrying of the newborn and breastfeeding ( $p=0.002$  and  $p=0.008$  respectively).

**Table (5)** shows statistical significant difference between two groups, 70.7% of intervention group satisfied with post cesarean incisional pain management versus 20% in control group.

**Table (6)** shows no statistical significant difference between both two groups regarding initiation of breastfeeding. On the other hand, there was statistical significant difference between them regarding mother's ability to sleep and rest as 77.3% of control group versus 52% of intervention group their ability to sleep and rest was greatly affected.

**Table1:- Distribution of Mothers' Knowledge about posts Cesarean Section pain**

Knowledge of pain relief measure	Control group (n=74)		Intervention group (n=74)		$\chi^2$	p -value
	No	%	No	%		
Correct Knowledge	32	43.2	53	71.6	22.432	0.004*
Incorrect Knowledge	42	56.8	21	28.4		
<u>Sources of information</u>					5.896	0.074
Family	33	44.6	40	54.0		
Friends	21	28.4	22	29.8		
Nobody	18	24.3	8	10.8		
Book	2	2.7	4	5.4		



Methods of pain relievers					56.658	0.001**
Analgesics	43	58.1	3	4.0		
Hot drinks	15	20.3	2	2.7		
Rest	9	12.2	22	29.8		
Massage	7	9.4	47	63.5		

\*Statistical significant difference ( $p \leq 0.05$ )

\*\*Highly statistical significant difference ( $p \leq 0.001$ )

**Table 2: Comparison of mean scores of pain levels between control and intervention groups at 6, 12 and 18 hours post Cesarean**

Pain level score	Control group	Intervention group	Significance	
	Mean $\pm$ S.D	Mean $\pm$ S.D	t	p
6 h. after delivery	5.44 $\pm$ 1.90	3.09 $\pm$ 1.55	8.23	0.001**
12 h. after delivery	4.37 $\pm$ 1.84	2.05 $\pm$ 1.17	9.22	0.001**
18 h. after delivery	2.52 $\pm$ 1.40	1.84 $\pm$ 1.10	8.17	0.001**

\*\*Highly statistical significant difference ( $p \leq 0.001$ )

**Table 3:-Frequency distribution of observed Mother's behavior immediately post cesarean section among control compared to intervention group**

Variables	Control group (n=74)		Intervention group (n=74)		Significant	
	No	%	No	%	$\chi^2$	p-value
Crying	22	29.7	18	24.3	0.302	0.583
Lip pitting	23	31.0	13	17.6	3.655	0.056
Clenched teeth	25	33.8	17	22.9	2.116	0.146
Immobilization	34	45.9	22	29.7	4.103	0.043*
Moaning	34	45.9	24	32.4	2.811	0.094
Restlessness	10	13.5	6	8.1	1.119	0.290

\*Statistical significant difference ( $p \leq 0.05$ )

**Table 4:- Frequency distribution of intervention and control groups regarding conditions aggravating pain**

Conditions that aggravating pain	Control group		Intervention group		Significant	
	No	%	No	%	$\chi^2$	<i>p</i>
Walking	31	41.9	21	28.4	2.943	0.086
Sitting	35	47.3	33	44.6	0.108	0.743
Carrying of the newborn	40	54.0	21	28.4	9.974	0.002*
Cough/sneezing	16	21.6	15	20.3	0.041	0.840
Breastfeeding	40	54.0	24	32.4	6.977	0.008*

\*Statistical significant difference ( $p \leq 0.05$ )

**Table 5:- Comparison between control and intervention groups to mother's satisfaction and their attitude regarding pain relief measures post Cesarean section**

Satisfaction with pain management	Control group		Intervention group		Significant	
	No	%	No	%	$\chi^2$	<i>p</i> - value
Not satisfied	35	47.3	0	0.0	56.427	0.001**
Slight satisfied	24	32.4	21	28.4		
Satisfied	15	20.2	53	71.6		

\*\*Highly statistical significant difference ( $p \leq 0.001$ )

**Table 6:- Frequency distribution about initiation of breastfeeding and ability to rest among intervention group compared to control group**

Variables	Control group		Intervention group		Significance	
	No	%	No	%	$\chi^2$	<i>p</i>
<u>Initiation of breast feeding:</u>						
Not affected	20	27.0	29	39.2	2.428	0.297
Slightly affected	22	29.7	19	25.7		
Greatly affected	32	43.2	26	35.1		
<u>Ability to sleep and rest:</u>						
Not affected	3	4.1	7	9.5	10.554	0.005*
Slightly affected	13	17.6	28	37.8		
Greatly affected	58	78.3	39	52.7		

\*Statistical significant difference ( $p \leq 0.05$ )

## DISCUSSION

The aim of this study was to assess the effect of foot massage on relieving post Cesarean section mothers' incisional pain through assessment of post Cesarean section pain level among mothers, assessment of post Cesarean section pain characteristics among mothers and assessment mothers' knowledge about pain relief measures post Cesarean section. The research hypothesis was that foot massage has a positive effect on relieving post Cesarean section pain. This aim was significantly achieved because there was highly statistically significant difference in the mean of pain score between control and intervention group at different assessment times. This difference demonstrated that foot massage could reduce the pain intensity in the intervention group. This finding was supported by <sup>(16)</sup> who investigated the effect of 20 minutes foot massage on post-operative pain; he found that there was statistically significant difference on the pain intensity between the control and the massage group after the intervention. For information about pain relief measures post Cesarean section the present study found that 49.7% and 44.3% of control and intervention groups respectively reported that they had information about pain relief measures post Cesarean section. this result is similar with <sup>(17)</sup> Chen & Hancock (2011) results which they found that 46% of group A had information about postoperative treatment of pain however they didn't received any preparation before surgery and 51.5% of Cesarean section women had information about pain relief measures respectively. The sources of knowledge about pain relief measures post Cesarean section, mothers in both groups reported their families and their friends as the main sources of information that represents. This result is go with <sup>(16)</sup> Chen & Hancock (2011) who found that the sources of information in their study were midwife for 61%, friends for 24% and family for 21% of cesarean section women. Regarding the methods of post Cesarean section pain relief measures, More than half of mothers in control group reported that analgesics were the commonest pain relief measures, and few of them were using the massage for pain relief. While about two thirds of mothers in the intervention group reported that the massage was the method used for relief. This result is consistence with <sup>(18)</sup> who found that most of the patient reported that analgesics medication decrease pain and only 2% mentioned massage as pain relief measures. This may be due to inadequate education about natural pain relief measures. This reflects lack of health education during antenatal period from health team. The present study result found that the means of pain level were (6.44±1.9 at 6 hours & 5.37±1.84 at 12 hours) after Cesarean section, take into consideration that control group received only analgesics as post-operative pain relief measures. This result is in accordance with <sup>(19)</sup> who reported that, the means of post Cesarean section pain in groups A, B & C were (7.9±1.5, 7.1±1.2 & 7.8±1.8 ) at 6 hours respectively and (5.2± 1.8, 6.7±1.9 & 5.6±2.1) at 12 hours respectively after using different doses of analgesics.

The present study results showed that, different observational of mother's behaviors (crying, restlessness, moaning) that were experienced by mothers during their pain. There was no significant differences between the two groups except for immobilization ( $p < 0.05$ ). In the same line, study results<sup>(20)</sup> stated that, women expressed pain in different behaviors such as crying, moaning, facial expression (lip biting) and body movement. Also, the Jewish patients expressed their pain through crying, moaning and complication. In addition, with regard to culture, Javanese and Batak patients responded to pain somewhat differently. Javanese patients showed stoic responses. In contrast, Batak patients demonstrated expressive responses<sup>(21)</sup>.

In the present study, the conditions that aggravating mothers' pain in both groups were sitting, standing and walking. Also with the same the study conducted by<sup>(22)</sup> reported that, sitting down and standing up followed by walking were the physical activities with the highest pain scores among Cesarean section women.

The result of the present study concluded that the ability to rest in the intervention group was significantly better than the control group and this may be due to less level of pain in the intervention group than level of pain in control group. This is in agreement with<sup>(23)</sup> results which reported that, pain level and ability to sleep was significantly improved with foot massage in intervention group.

Also The study revealed that there was no statistical significance difference between intervention and control groups regarding effect of pain on initiation of breast feeding, a highly percentage of mothers in both groups reported that initiation of breast feeding was greatly affected by pain in the first hours of delivery and this not a surprising because cesarean section women's ability to breast feeding greatly affected by pain in the first hours after delivery according to the previous studies results by<sup>(24)</sup>.

The present study repeated that mothers' satisfaction of pain management was significant better in the intervention group than the control group ( $p < 0.001$ ) for the first 18 hours of Cesarean section surgery. The study conducted by<sup>(25)</sup> is supporting the present study results; these results proved that, the massage group rate treatment statistically significantly better than the control group ( $p < 0.001$ ).

The present study concluded that foot massage which is cheap, natural measures of pain relief was highly minimizing post cesarean section incisional pain. As we are a developing country with a limited facility and limited hospital beds, this method can be utilized by all maternity nurses during postnatal period as a successful measure for incisional pain relief rather than pharmacological methods. Moreover foot massage method is cost effective and it has high efficacy because it is inexpensive and it has no harm to the mothers and the neonatal health<sup>(26)</sup>.

## CONCLUSION

Foot massage has a positive effect in reducing the mean score of pain level post cesarean section accordingly this conclusion replies the study hypothesis. Also, there was a highly significant improvement was observed among subjects in the intervention group compared to control group regarding the mother's satisfaction.

## Recommendations

Designing health education training program for nurses about foot massage as it is an inexpensive pain relief measure, with no harm to the mothers. In addition, there is need for further study to investigate health team attitude regarding this method. Brochure about foot massage must be distributed among maternity health facilities in the Egyptian Ministry of health Hospitals.

## REFERENCES

1. Gibbs, R. S., Karlan, B. Y., Haney, A. F., et al., (2008): Danforth's Obstetrics and Gynecology (10th ed). Philadelphia, USA: Lippincott Williams & Wilkins, PP.491-503.
2. Menacker, F. and Halmiton, B. E., (2010): Recent Trends in Cesarean Delivery in the United States. NCHS Data Brief, 35. Retrieved on April 19, 2011 from: <http://www.cdc.gov/nchs/data/databriefs/db35.htm>
3. Khawaja, M., Jurdi, R. and Khasholian, T. K., (2004): Rising trends in cesarean section rates in Egypt. Birth, 31 (!):12-6.
4. Nabhan, A. F., (2008): long-term outcomes of two different surgical techniques for cesarean. International journal of Gynecology & Obstetrics, 100 (1): 69-75
5. White L., Duncan, G. and Banumle, W., (2011): Foundations of Maternal & Pediatric Nursing (3rd ed). USA: Delmar, Cengage Learning, p92.
6. Reynolds, F., (2011): Labour analgesia and the baby: good news is no news. International Journal of Obstetric Analgesia, 20:38-50.
7. International Association for the study of pain (IASP) (2103): PAIN Terminology. Available at: <http://www.iasp-pain.org>.
8. Andres, J., Fischer, H. B. J., Ivani, G., et al., (2009): postoperative pain management- Good Clinical practice General recommendations and principles for successful pain management. Available at: <http://www.esraeurope.org/postoperativepainmanagement.pdf>. Accessed 5 may 2011.
9. American college of physicians (ACP) (2008): Massage therapy may have immediate positive effect on pain and mood for advanced cancer patients. Available at: <http://www.science.daily.com/releases/2008/09/080915174534.htm>
10. Fritz, S. and Synder, W. R., (2009): Mosby's Fundamentals of therapeutic massage (4th ed). CHINA: Mosby Elsevier, PP. 142-463.
11. Freeman, L., (2009): Mosby's Complementary & Alternative Medicine (3rd ed ). Chin: Mosby Elsevier, PP. 364- 385.
12. Kainu, J. P., Sarvela, J., Tiippana, E. M. et al., (2010): persistent pain after caesarean section and vaginal birth: a cohort study. International Journal of Obstetric Anesthesia, 19:4-9.
13. Vermelis, J., Wassen, M., Fiddlers, A., et al., (2010): Prevalence and predictors of chronic pain after labor and delivery. Current Opinion in Anaesthesiology, 23:295-299.

14. Declercq, E., Cunningham, D, Johnson, C. and Sakala, C., (2008): Mothers reports of postpartum pain associated with vaginal and cesarean deliveries: results of a National survey. *Birth*, 35:16-24.
15. Wang, H. L., & Keck, J. F., (2004): Foot massage as an intervention for postoperative pain. *Pain management nursing*, 5(2):59-65.
16. Asadizaker, M., Fathizadeh, A., Haidari, A., et al., (2011): the effect of foot massage on postoperative cardiac surgery pain. *International journal of nursing and midwifery*, 3(10): 165-169. Available at: <http://www.academicjournals.org/IJNM>.
17. Chen, M., and Hancock, H., (2011): Women's knowledge of options for birth after Cesarean section. *Women birth*, doi: 10.1016/j.wombi.2011.08.001.
18. Buyukyilmaz, F. E. and Asti, T., (2010): POSTOPERATIVE PAIN CHARACTERISTICS IN Turkish Orthopedic patients. *Pain management nursing*, 11(2): 76-84.
19. Jabalameli, M., Saryazdi, H. and Massahipour, O., (2010): The Effect of Subcutaneous Dexamethasone. Added to Bupivacaine on post cesarean [ain: ARandomized Controlled Trial. *Iran J Med Sci*, 35(1).
20. Yildirim, G. and Sahin, N, H. (2004): The effect of breathing and skin stimulation techniques on labor pain perception of Turkish women, *pain Res manage*, 9 (4): 183-184.
21. Suza, D.E. (2007): PAIN Experiences and pain management in postoperative patients. *Majalah Kedokteran Nusantara*, 40(1).
22. Sousa, L., Pitangui A. C. R. and Gomes, F. A., et al., (2009): Measurement and characteristics of post-cesarean section pain and the relationship to limitation of physical activities. *Acta Paul Enferm*, 22(6):741-7.
23. Adams, R., White, B. and Beckett, C., (2010): the effect of massage therapy on pain management in the acute care setting. *International journal of therapeutic massage & bodywork: research, education, & practice*, 3(1).
24. Karlstrom, A., Olofsson, R. E., Norbergh, K. G., et al., (2007): Postoperative Pain after Cesarean birth Affects Breastfeeding and Infant care. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 36(5): 430-440.
25. Seers, K., Crichton, N., Martin, J., et al., (2008): A randomized controlled trial to assess the effectiveness of a single session of nurse administered massage for short term relief of chronic non-malignant pain. *BMC Nursing*, 7:10doi:10.1186/1472-6955-7-10.
26. Gupta, A. K., Sharma, S., et al., (2010): Clinical aspects of acute post-operative pain management & its assessment. *J Adv pharm Tech Res.*, 1:97-108. Available at: <http://www.japtr.org/text.asp?2010/1/2/97/72250>