

Effect of Maternal Attachment on Infancy Pain Reduction during Invasive Procedures

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Abstract

Background: This study aimed to assess the effect of maternal attachment on infancy pain reduction during invasive procedures. **Research design:** A descriptive study was conducted to carry out this study. **Settings:** Pediatric Medical wards in Beni-Suef University Hospital and Children Hospital affiliated to Ain-Shams University Hospitals. **Sample:** A purposive sample includes one hundred infants from 1 month to 1 year and their accompanied mothers who are admitted to the previously mentioned settings. **Tools:** A structured questionnaire sheet to assess mothers' knowledge regarding invasive procedures and its pain. The second tool was Likert like type scale to assess mothers' perception regarding maternal attachment during invasive procedures. The third tool was face rating pain scale to assess infants' pain during invasive procedures. **Results:** revealed that two fifths of studied mothers were in the age group 20 >30 years old and more than one third of them were illiterate. More than half of studied mothers had unsatisfactory level of knowledge about invasive procedures and its pain and less than two thirds of them had positive perceptions about maternal attachment during invasive procedures. **Conclusion:** the study concluded that, more than half of studied mothers had unsatisfactory level of knowledge regarding invasive procedures, nearly two thirds of them had a positive perception towards maternal attachment during invasive procedures, and more than three quarters of studied infants with their mothers' participation had a moderate level of pain. **Recommendations:** The study recommended that, implementation of educational program for mothers regarding maternal attachment and importance of their presence with their infants during invasive procedures.

Key words: Maternal Attachment, Mothers' Knowledge, Perception, Infants.

Introduction

According to; **The International Association for the Study of Pain (2014)**, pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Perception of pain in pediatrics is complex and entails physiological, psychological, behavioral and developmental factors (**Srouji et al., 2010**).

An infant means unable to speak or speechless. The term infant is typically applied to young children between the ages of 1 month and 12 months. Infants may express their pain

in different ways such as in their facial expressions, and changes may also occur to their heart rate, breathing, blood pressure and color. The infants whom experience many painful procedures may show changes to their behavior in later childhood (**Wikipedia, 2015**).

Infants routinely experience pain associated with commonly used invasive procedures such as blood sampling and intramuscular injections. Reduction of pain is both a professional imperative and an ethical expectation because untreated pain has

detrimental consequences such as greater pain sensitivity in later childhood and may lead to permanent neuroanatomical and behavioral abnormalities (Johnston et al., 2011).

Nurses understand the need to integrate families, particularly mothers, into the care of hospitalized infant. This need is driven by the desire to avoid potential health problems posed by separation and interruption of maternal-infant relationships. (Harbaugh et al., 2010).

Mother-infant attachment is a complex link, which involves a consistency and a pattern of behaviors that solidifies trust and security between mother and infant. This attachment provides the ability to have a heightened awareness of infant's needs through closeness and commitment. Attachment is based on the mother's sensitivity to respond to her infant's needs. Mother-infant attachment can be assisted through clinical and social support (Hampton, 2014).

Invasive procedures are the most common reasons for pain in hospitalized infants. Invasive procedures may be mildly invasive such as stitches, shots, and blood draws, or may be more invasive as lumbar punctures or surgeries. Invasive procedures can cause infants emotional distress and varying degrees of pain. Information about procedure pain in infants is growing as there is increased interest and awareness among health care providers. It is important to think about pain control before the procedure begins, not after the infant has become increasingly fearful and difficult to calm (Carbajal et al., 2011).

Significance of the study

Mothers play an important role in their infants' life, especially during the infant's pain. Infants who are sick experience multiple invasive and tissue-damaging procedures in emergency, acute, and critical care units. These procedures are presumed to be painful and occur during the early days of life as part of stabilizing, diagnosing, and treating infant's condition (Lago et al., 2009). Maternal attachment is very important process to relieve

infant's pain during hospitalization; this process may include bonding, rooming in, touch and talk. Therefore, this study will be conducted to assess the effect of maternal attachment on infancy pain reduction during invasive procedures.

Aim of the study

This study aimed to assess the effect of maternal attachment on infancy pain reduction during invasive procedures.

Research questions:

- Is there an effect of maternal attachment on infancy pain reduction during invasive procedures?
- What is the mothers' knowledge regarding invasive procedures and its pain?
- What is the mothers' perception regarding maternal attachment during invasive procedures?

Subject and methods

I. Technical design:

Research design: A descriptive design was utilized to achieve the aim of this study.

Research Setting: The study was conducted at pediatric medical wards in Beni-Suef University Hospital and Children Hospital affiliated to Ain-Shams University Hospitals.

Subjects: A purposive sample included 100 infants and their accompanied mothers who are admitted to the previously mentioned settings; 40 infants with their mothers from Ain Shams Children's Hospital, and 60 infants with their mothers from Beni Suef University Hospital under the following criteria inclusion:

- Infants aged from one month to one year.
- From both gender.
- Regardless their diagnosis, residence.

Tools for data collection:

• **Tool (1): An Interviewing Questionnaire Sheet:** It was designed by the researcher after reviewing the related literature; it was written in simple Arabic language, to suit the level of mothers, in the form of closed ended questions and multiple choices. It included three parts, characteristics of infants included age, gender, ranking, previous hospitalization and causes of previous hospitalization. Characteristics of mothers

included age, level of education, marital status, place of residence, number of children and occupation. Knowledge of mothers about invasive procedures and its pain, such as meaning, aim, types, complications, symptoms and role of mothers. Perception of mothers regarding maternal attachment during invasive procedures.

Scoring system:

Each item was scored (1) for correct answer and (0) for incorrect answer. The total score of all questions was summed and the total mothers' knowledge was categorized into two levels, unsatisfactory knowledge (<50%) and satisfactory knowledge ($\geq 50\%$).

• **Tool (2): Face rating pain scale:** It was adopted from *Wong et al., (2001)* to assess infants' pain during invasive procedures. This scale comprises of six cartoon faces, with expressions ranging from a broad smile (representing "No hurt") to very sad and tearful (representing "Hurts worst") with each becoming progressively sadder; its degrees from zero to 5. Researcher assessed infant's face during invasive procedure and circled the same face in the face rating pain scale that expressed infant's feeling.

II. Operational design:

The operational design included preparatory phase, exploratory phase and field work.

• **Preparatory phase:** During this phase, tool contents were prepared through reviewing related references to construct the study tools.

• Validity and reliability:

✓ **Validity** was ascertained by a group of experts in Pediatric Nursing. Their opinions were elicited regarding the format, layout, consistency, comprehensiveness, accuracy and relevancy of the tools.

✓ **Reliability** was ascertained by measuring their internal consistency to identify the extent to which the items of the tools measure the same concept and correlate with each other. It is used to compute correlation

value among questions Cronbach's Alpha and its value was (0.83).

Ethical considerations:

✓ The research approval was obtained from the Ethical Committee before starting the study.

✓ The researcher was clarity the objective and aim of the study to subjects includes the study.

✓ The researcher was assuring maintain anonymity and confidentiality of subject's data.

✓ Subjects were informed that they are allowed to choose to participate or not in the study and they were the right to withdraw from the study at any time.

• Pilot study:

A Pilot study was carried out on 10% (10 infants with their mothers) of total sample to test the clarity and applicability of tools and determine the needed time. After analyzing the pilot study results, the necessary modifications were done such as, added questions to assess mothers' perception and knowledge, in addition to rephrased of some questions. Finally the infants and their mothers who were taken in pilot study were excluded from the study subjects.

Field work:

The actual field work was carried out over 6 months started from beginning of February (2018) to the end of July (2018). The researcher was available two days/week (Sunday and Tuesday) in Beni-Sueif university hospital and one day weekly (Wednesday) in Children Hospital affiliated to Ain-Shams University throughout the morning shift from 9Am to 2 Pm and started by introducing herself to the mothers then informing them about the aim of the study. The researcher was asking mothers questions to fulfill the questionnaire sheet, the time consumed for completion of questionnaire ranges from 10-15 minutes. The researcher assessed the infants' degree of pain by using face rating pain scale during invasive procedures that carried to them.

III. Administrative design

An official permission was obtained by submission of a formal letter issued from the Dean of Faculty of Nursing, Ain Shams University to the director of each of the previously mentioned settings to collect the necessary data for current study after a brief explanation of the purpose of the study and its expected outcomes.

IV. Statistical Design:

The collected data were organized, tabulated and statistically analyzed using Statistical Package for Social Studies (SPSS) version 19. For quantitative values the mean and standard deviations were calculated. Chi square test was used to detect the statistical differences between variables. When chi square test was not suitable due to presence of observations with small number, Fisher exact test was used.

Results

Table (1) shows that, the mean age of the studied infants of 7.4 ± 3.7 , more than half (51%) of them aged (4 - 9) months and more than two thirds (69%) of them were female. Additionally this table reveals that less than half (43%) of studied children had previously hospitalization and 17% of them hospitalized due to gastroenteritis.

Table (2) illustrates that the mean age of the studied mothers of 38 ± 6.8 , two fifths (40%) of them were in the age group $20 > 30$ years old and more than one third (38%) of them were illiterate. Also, the majority of mothers (83%) were married, and 75 % of them were employee.

Figure (1) shows that less than half (47%) of the studied mothers have satisfactory knowledge about invasive procedures and its pain, while more than half (53%) of them have unsatisfactory knowledge.

Figure (2) illustrates that half (50%) of studied mothers participated in restrain of their infants during invasive procedures, while the other half of them did not participate.

Figure (3) reveals that less than two thirds (61%) of studied mothers have positive perceptions about maternal attachment during invasive procedures, while the rest of them (39%) of them have a negative perception.

Figure (4) represents that less than half (45%) of studied infants have moderate pain according to face pain rating scale, while 23% and 32% of them have sever and worst pain respectively.

Table (3) reveals that there is statistical significant difference between children' pain and mothers' participation during invasive procedures ($p < 0.05$). Where, more than three quarters (76%) of studied infants with their mothers participation have a moderate level of pain; while more than half (54%) of studied infants without their mothers participation have a worst level of pain.

Table (4) reveals that there is statistical significant difference ($p < 0.05$) between mothers' participation during invasive procedures and their total knowledge regarding invasive procedures and its pain. Almost two thirds of participated mothers had satisfactory knowledge, while less than three quarters of non-participated mothers had unsatisfactory knowledge.

Table (5) clarifies that there is statistical significant difference ($p < 0.05$) between mothers' participation during invasive procedures and their total perception regarding maternal attachment during invasive procedures. Most of participated mothers had a positive perception, while more than half of non-participated mothers had a negative perception.

Table (1): Distribution of studied children according to their characteristics (n=100)

Items	N	%
Age/ months:		
• 1 < 3	25	25
3 < 6	31	31
• 6 < 9	20	20
• 9 < 12	24	24
Mean + SD :57+7.6		
Gender:		
• Male	31	31
• Female	69	69
Child's ranking:		
• First	30	30
• Second	30	30
• Third and more	40	40
Previous hospitalization:		
• Yes	43	43
• No	57	57
Causes of previous hospitalization:		
• Gastroenteritis	17	17
• Bronchitis	15	15
• Asthmatic	9	9
• Urinary Tract Infection	2	2

Table (2): Distribution of studied mothers according to their characteristics (n=100)

Items	N	%
Age/ years:		
• 20 -	40	40
• 30 -	33	33
• 40 – 50	27	27
Mean + SD: 38 ± 6.8		
Education:		
• Illiterate	38	38
• Primary	30	30
• Secondary	22	22
• University	10	10
Marital status:		
• Married	83	83
• Divorced	12	12
• Widowed	5	5
Occupation:		
• House Wife	25	25
• Employee	75	75
Residence place:		
• Rural	59	59
• Urban	41	41

Figure (1): Distribution of studied mothers according to their total knowledge about invasive procedures and its pain

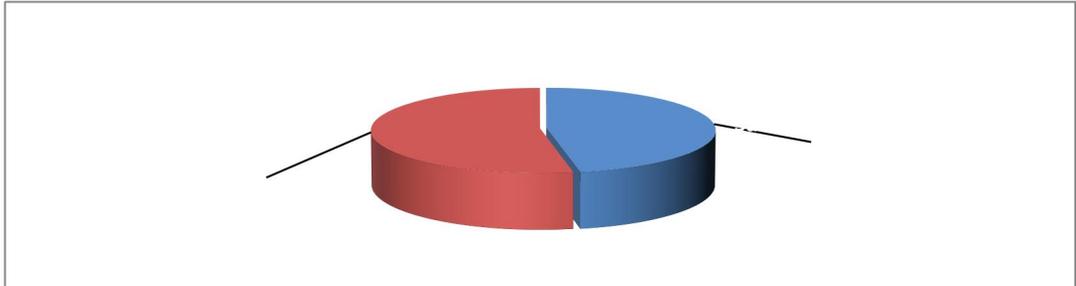


Figure (2): Distribution of studied mothers' opinion regarding their participation during invasive procedures (n=100)

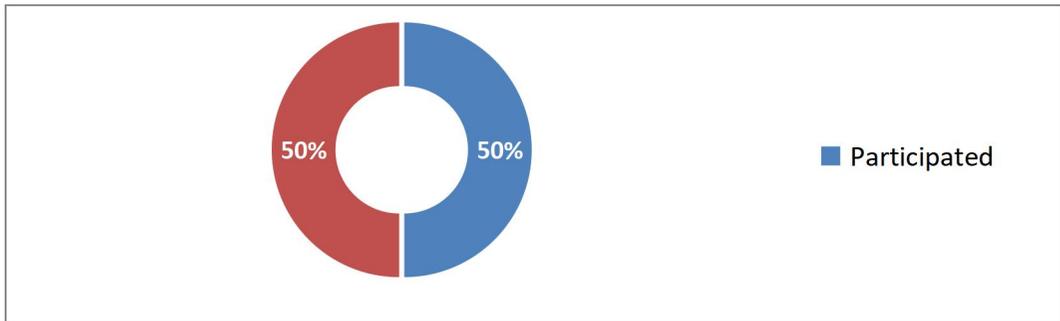


Figure (3): Distribution of studied mothers according to their total perception about maternal attachment during invasive procedures

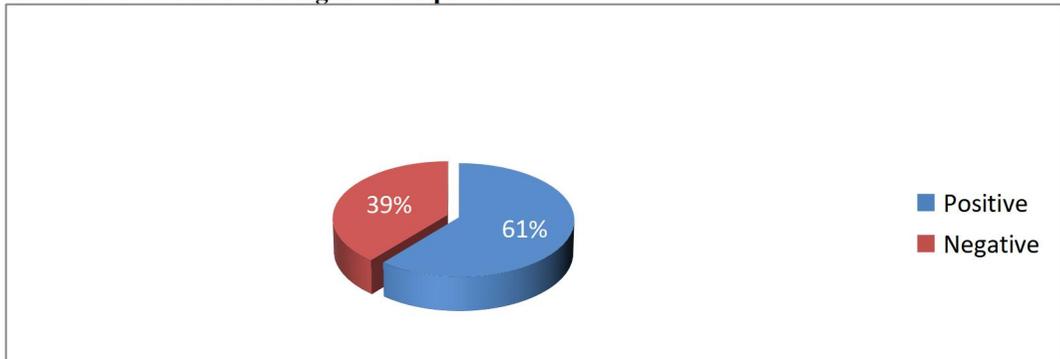


Figure (4): Percentage distribution of studied infants according to their pain measurement scale

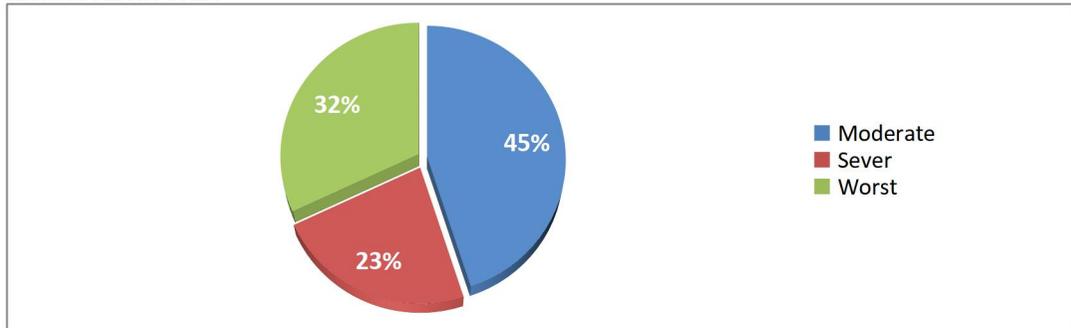


Table (3): Association between mothers' participation during invasive procedure and child's level of pain

Levels of pain	Moderate		Severe		Worst		X ²	P value
	N	%	N	%	N	%		
Mothers Participation								
Participated	38	76	7	14	5	10	40	0.000*
Not participated	7	14	16	32	27	54		

* Statistically significant($p < 0.05$)

* Statistically significant($p < 0.05$)

Table (4): Association between mothers' participation during invasive procedure and their total knowledge regarding invasive procedures and its pain

Mother Participation	Satisfactory		unsatisfactory		X ²	P
	N	%	N	%		
Participated	33	66	17	34	14.4	.0001*
Not participated	14	28	36	72		

* Statistically significant($p < 0.05$)

Table (5): Association between mothers' participation during invasive procedure and their total perception regarding maternal attachment during invasive procedures

Mother Participation	Positive		Negative		X ²	P
	N	%	N	%		
Participated	40	80	10	20	15.1	.00001*
Not participated	21	42	29	58		

* Statistically significant($p < 0.05$)

Discussion

On assessing the characteristics of the studied infants **table (1)**, the findings of the current study revealed that more than half of studied infants aged 4 – 9 months and ranked as a third infant in their families. These findings were in agreement with the findings of **Wylie (2014)**, who studied "Postoperative pain in newborn and infants" and mentioned that the

studied infants aged from one month to more than 10 months and ranked as the third infant. Regarding gender of studied infants, the finding of the current study revealed that more than two thirds of them were females. This finding was supported by the finding of **Burcu & Nurten (2016)**, who studied "Effect of family presence on pain and anxiety during invasive nursing procedures in an emergency department" and reported that most of the studied sample was females.

Regarding to characteristics of studied mothers **table (2)**, the finding of the present study clarified that less than half of studied mothers aged 20 < 30 years. This finding was disagreement with the finding of *El-Sharkawy (2014)* who studied "Effect of tactile stimulation on reducing infant's postoperative pain after abdominal surgery" and reported that the majority of studied mothers aged 20 – 30 years. Regarding level of education of studied mothers, the finding of the current study showed that less than two fifth of studied mothers was illiterates. This finding not in accordance with the finding of *Pinto & Barbosa (2007)*, who studied "Maternal-Infant Bonding and The Mother's Participation during Venipuncture: A Psychoanalytic Perspective " and mentioned that most of the studied mothers had university graduation. This could be due to differences between cultural and economic status between different countries. The findings of the current study clarified that the highest percentage of studied mothers were married and employee. These findings were in accordance with the findings of *Burcu & Nurten (2016)*, who reported that the majority of studied sample were married and work.

As regards mothers' total knowledge about invasive procedures and its pain **figure (1)**, the findings of the current study indicated that more than half of studied mothers had unsatisfactory level of knowledge; this could be due to low educational level of studied mothers that more than one third of them were illiterate; in addition to more than half were from rural area. This finding was contradicted with the finding of *Tarja et al., (2018)*, who said that more than half of studied parents had a high level of knowledge about painful invasive procedures, and added that more than half of them were college and university education.

Regarding mothers' participation during invasive procedures **figure (2)**, the findings of current study revealed that half of studied mothers not participate with their infants during applying invasive procedures; this could be due to their inability to see their infants in pain and sometimes their participation disturbed nurses' work. This finding was in agreement with

finding of *Rennick et al., (2011)* who studied "Mothers' experiences of a Touch and Talk nursing intervention to optimize pain management in the PICU" and mentioned that less than two thirds of studied mothers were unable to participate with their infants during invasive procedures, because they didn't want to see their infants in these painful procedures.

Concerning mothers' total perception about maternal attachment during invasive procedures **figure (3)**, the finding of the current study clarified that less than two thirds of studied mothers were have a positive perception about maternal attachment during invasive procedures. This finding was in agreement with the finding of *Ditzel (2016)*, who studied "Parent Presence during Invasive Procedures", and reported that more than three quarters of studied sample were have a positive perception about their presence with their children during invasive procedures.

The result of the current study **figure (4)**, illustrated that more than half of studied infants were have sever and worst pain according to face pain rating scale during invasive procedures; this could be due to their exposure to several painful invasive procedures during their hospitalization. This finding was supported by the finding of *Walther-Larsen et al., (2016)* who studied "Pain prevalence in hospitalized children" and mentioned that more than half of studied children experienced severe pain during applying invasive procedures, while less than half of them were have moderate level of pain.

Regarding the relation between mother participation during invasive procedures and child's level of pain **table (3)**, the findings of the present study showed that there was statistical significant difference between child's level of pain and mothers participation during invasive procedures; it could be due to the importance of mothers' attachment and participation during applying the painful medical procedures for their hospitalized infants. This finding was in agreement with the finding of *Mastuda-Castro and Linhares (2014)*, who revealed that there was a significant positive correlation between

child's pain and presence of mothers during painful medical procedures.

On assessing the association between mothers' participation during invasive procedures and their total knowledge about invasive procedures and its pain **table (4)**, the finding of the current study illustrated that there was statistical significant difference between mothers' participation and their total knowledge. Almost two thirds of participated mothers had satisfactory level of knowledge, while less than three quarters of non-participated mothers had unsatisfactory level of knowledge. This could be due to participated mothers had an increased understanding of their infants' condition. This finding was in agreement with the finding of *Duran et al., (2007)* who studied "Attitudes toward and beliefs about family presence: A survey of healthcare providers, patients' families, and patients", and reported that there was statistical significant difference between parents' participation and their total knowledge.

As regards the association between mother participation during invasive procedures and their total perception about maternal attachment during invasive procedures **table (5)**, the finding of the current study showed that there was statistical significant difference between mothers' participation and their total perception. Most of participated mothers had a positive perception, while more than half of non-participated mothers had a negative perception. This finding was supported by the finding of *Edwards et al., (2013)*, who studied "Changes in provider perceptions of family presence during resuscitation" and mentioned that there was statistical significant difference between parents' participation and their attitude toward maternal attachment during painful procedures; and added that parents who participated with their infants during invasive procedures also reported higher level of emotional support and they felt comfort with this participation,

Conclusion

In the light of the current study, it can be concluded that, more than three quarters of

studied infants had a moderate level of pain with their mothers' participation, while more than half of them had a worst level of pain without their mothers participation, and more than half of studied mothers had unsatisfactory level of knowledge regarding invasive procedures and its pain, while nearly two thirds of them had a positive perception towards maternal attachment during invasive procedures.

Recommendations

- Allowing mothers participation during invasive procedures with their infants.
- Educational program for mothers about maternal attachment and its importance.

References

- Burcu İşlekdemir and Nurten Kaya (2016):** Effect of family presence on pain and anxiety during invasive nursing procedures in an emergency department: A randomized controlled experimental study. *International Emergency Nursing* 24 (2016) 39–45.
- Carbajal, R., Rousset, A., Danan, C., Coquery, S., Nolent, P., and Ducrocq, S. (2011):** Epidemiology and treatment of painful procedures in neonates in intensive care units. *J. Am. Med. Assoc.*; 300(1), P: 60–70.
- Harbaugh L. Bonnie, Tomlinson S. Patricia, and Gross R. Cynthia (2010):** An Ethological Approach to Measuring Maternal Caretaking during Critical Child Illness. *Southern Online Journal of Nursing Research*; 10(4), P: 76-77.
Available at: <https://www.snrs.org>
- Johnston, C., Rennick, J., Filion, F., Campbell-Yeo, M., Goulet, C., Bell, L., Tucci, M. and Ranger, M. (2011):** Maternal Touch and Talk for Invasive Procedures in Infants and Toddlers in the Pediatric Intensive Care Unit. *Journal of pediatric nursing*.
- Lago P., Garetto E., and Merazzi D. (2009);** Pain Study Group of the Italian Society of Neonatology. Guidelines for procedural pain in the newborn. *Acta Paediatr*; 98(6), P: 932-939.
- Mastuda-Castro C. Ana and Linhares B. Maria (2014):** Pain and Distress in Inpatient

- Children According to Child and Mother Perceptions. *Paidéia*, 24(59): 351-359.
- Pinto JP, Barbosa VL. (2007):** Maternal-infant bonding and the mother's participation during venipuncture: a psychoanalytic perspective. *Rev Latino-am Enfermagem janeiro-fevereiro*; 15(1):150-5.
- Rennick, J., Lambert, S., Hilderhose, J., Campbell-Yeo, M., Fillion, F. and Johnston, C. (2011):** Mothers' experiences of a Touch and Talk nursing intervention to optimise pain management in the PICU: A qualitative descriptive study. *Intensive and Critical Care Nursing*, 27, p.151-157.
- Srouji R., Rathapalan S., and Schneeweiss S. (2010):** Pain in Children: Assessment and Non-Pharmacological Management. *International Journal of Pediatrics*; P: 101-155.
- Tarja Pölkki, Anne Korhonen, Helena Laukkala (2018):** Parents' Use of Nonpharmacologic Methods to Manage Procedural Pain in Infants. *JOGNN*, 47: 43–51.
- The International Association for the Study of Pain (2014):** Assessment and Non-Pharmacological Management.
- Walther-Larsen S., Pedersen M. T., Friis S. M., Aagaard G. B., Rømsing J., Jeppesen E.M. (2016):** Pain prevalence in hospitalized children: a prospective cross-sectional survey in four Danish university hospitals. *Acta Anaesthesiologica Scandinavica*, 61(2017) 328–337.
- Wikipedia foundation: April, 25, 2015.**
<http://en.wikipedia.org/wiki/Infant>
- Wylie J., (2014):** Postoperative Pain in Newborn. *N En J Med.*, 351 (25): 2581-2589.