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# Effectiveness of Facilitated Tucking in Reducing the Pain Response during Veinpuncture among Preterm Neonate Admitted in NICU and Postnatal Ward at Tertiary Care Hospital

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**Abstract:** ***The infants who born preterm was depend on intensive care, associated with an exceedingly large amount of painful procedures. The study was aimed to assess the pain response during vein puncture in control group and effectiveness of facilitated tucking in reducing the pain response during vein puncture among preterm neonate admitted in Neonatal Intensive Care Unit and postnatal ward in experimental group at Krishna Hospital and Medical Research Centre, Karad, Maharashtra, India. The study design was Post test only control group design.30 preterm neonates in experimental group with facilitated tucking and 30 with routine NICU method in control group were the sample selected by non probability purposive sampling technique. The result shows that the mean pain scores of experimental group was 2.47 and control group was 6.17. The unpaired t-test value was 20.76, (p<0.001) showing a significant difference between mean pain level of neonates for control and experimental group as p value <0.05. The study concluded that the facilitated tucking is a non-pharmacological, effective, simple, inexpensive and safe pain management technique for reduction in pain during the vein puncture procedure.***

**Keywords:** Effectiveness, Pain, facilitated, Tucking, Preterm

## 1. Introduction

Pain management in a Neonatal Intensive Care Unit (NICU) is a difficult task to accomplish. Pain is both sensory and emotional experience. Preterm babies experience pain more because due to presence of the peripheral and central structure necessary for nociception. Infants that are born preterm before their complete growth and development occurs and they are prepared to cope with an external environment. The preterm infant is depend on intensive care, associated with an exceedingly large amount of painful procedures.[1]

The majority of ordinary painful procedures carry out during infancy are regular injections, heel prick, vein puncture, vaccination without pain management [2], also Painful events like medical and nursing procedures and the physical environment serve as stress imparting factors for neonate in NICU. The preterm neonates experience pain throughout the beginning stages of life and long-term adverse effects, for example respiratory distress, apnea, bradycardia, hypotension, desaturation, and that pain negatively effects the development of the central nervous system [3] and also due to stress and pain in preterm, there may be lifelong consequences like cognitive, learning, psychosocial disorders, poor motor performances, impulsive behaviour, lack of control in social situation. [3]

A non-pharmacological method such as facilitated tucking is considered for pain relief in preterm neonates. Facilitated tucking are the general placing of a neonate arms and legs in flexed, midline position near to the neonate body at the time of the neonate are in a lateral recumbent position. Facilitated Tucking is the simplest non pharmacological and cost effective technique simulating the condition of being in uterus. This helps the preterm infant comfortable, more secure with controlled response. It facilitates self regulation by decreasing the physiologic response like tachycardia last for longer time that causes stabilization of pain Stress [3].

Pain management in preterm can be classified as pharmacological or non pharmacological. For managing severe pain, narcotics or opiates pharmacological agents are used but, the use of medication include risk such as respiratory depression, sedation, nausea, seizures, and physiological dependence[4]' and non pharmacological methods such as non-nutritive sucking, music, swaddling, kangaroo care, maternal touch and "facilitated tucking" helps in reducing the pain. [5]. For prevention of pharmacological complication in preterm neonates Facilitated Tucking helps and it facilitates self regulation by decreasing the physiologic response like prolonged heart rate elevation that contributes to the disequilibrium associated with pain and stress[3].

Preterm birth is the most common cause of death among infants worldwide. About 15 million babies are preterm each year (5% to 18% of all deliveries). In many countries rates of premature births have increased between the 1990s and 2010s. Complications from preterm births resulted in 0.74 million deaths in 2013 down from 1.57 million in 1990.The chance of survival at fewer than 23 weeks is close to zero, while at 23 weeks it is 15%, 24 weeks 55% and 25 weeks about 80%. [6]

Non pharmacologic interventions are recommended for pain management and effectively reduce pain during painful procedures. So non pharmacological method such as Facilitated Tucking improves the emotional security and

reduces the pain perception also it is a effective, useful, simple method for reducing pain during the procedure [2].

## 2. Objectives of the study

1) To assess the pain response during veinpuncture among preterm neonate admitted in Neonatal Intensive Care Unit and postnatal ward in control group.
2) To assess the effectiveness of facilitated tucking in reducing the pain response during veinpuncture among preterm neonate admitted in Neonatal Intensive Care Unit and postnatal ward in experimental group.

**Assumption**

Effectiveness of facilitated tucking may be more effective than routine NICU method during veinpuncture. The facilitated tucking helps in reducing the pain response during veinpuncture.

**Hypothesis**

- **$H_0$** – There will not be significant difference between pain level in experimental and control group.
- **$H_1$ –** There will be significant difference between pain level in experimental and control group.

## 3. Methods

The Post test only control group design was used to conduct the study among preterm neonates admitted in NICU and postnatal ward at Krishna Hospital and Medical Research Centre, Karad. Totally 60 samples in that 30 preterm neonates in experimental with Facilitated tucking and 30 in control group with routine NICU method during vein puncture were the sample selected by non probability purposive sampling technique. The samples included in this study that fulfilled the inclusion criteria with Preterm neonates who born between 28 to 32 weeks of gestation, admitted in NICU and Postnatal ward and whose parents are willing to subject their preterm neonate to Facilitated Tucking. Samples with chromosomal or genetic anomalies, who Receiving analgesic or sedating medication and having musculo-skeletal disorders were excluded from the study .

The permission to conduct the study was obtained from research ethics committee and Medical Director of Krishna Institute of Medical Sciences Deemed University Karad had given permission before the data collection .After collecting the demographic data the preterm neonate in facilitated tucking position were arms and legs in a flexed, midline position near to the neonate body either in a side-lying position.Facilitated tucking during the needle insertion and continue till the preterm become calm or three minutes after the veinpuncture.Pain is assessed by using the Neonatal Infant Pain Scale.

**Description of the tool**

**Section A:** This section consist of Demographic variable - Age, gender, gestational age and birth weight

**Section B:** Procedure of implementation of facilitated tucking on preterm neonates

**Section C:** Neonatal Infant Pain Scale for pain

There are total 7 items. Scoring has been categorized in the following manner:

0-2 mild to no pain, 3-4 = mild to moderate pain, >4 = severe pain

## 4. Result

**Table 1: Section I:** Analysis of baseline characteristics

Distribution of the preterm neonate in relation to demographic variables

| Parameters | Control | Experimental |
|---|---|---|
| Mean | 6.17 | 2.47 |
| Std. Dev. | 0.75 | 0.63 |
| Unpaired t value | 20.76, <0.001* | |

Table 1 shows that among all the study preterm neonates, 56.7% of the experimental group and 46.7 % of the control group were within the age group1-2 days and most of them, i.e 53.3% of experimental and 70 % of control group were male .Nearly 56.7% of the experimental and 56.7 % of the control group were having birth weight 1-1.5 kgs. The majority of preterm neonates i.e. 60%in experimental and 76.7% in control group were belong to 32 weeks of gestation.

**Table 2:** Represents distribution of the neonate in relation to Neonatal Infant Pain Scale. (n=60)

| Parameters | | Control | | Experimental | |
|---|---|---|---|---|---|
| | | Frequency | % | Frequency | % |
| Age (in days) | 1-2 | 14 | 46.7 | 17 | 56.7 |
| | 3-4 | 10 | 33.3 | 5 | 16.7 |
| | 5-8 | 6 | 20.0 | 3 | 10.0 |
| | >15 | 0 | 0.0 | 5 | 16.6 |
| Sex | Males | 21 | 70.0 | 16 | 53.3 |
| | Females | 9 | 30.0 | 14 | 46.7 |
| Birth weight (in kgs) | <1 | 0 | 0.0 | 3 | 10.0 |
| | 1-1.5 | 17 | 56.7 | 18 | 60.0 |
| | ≥1.5 | 13 | 43.3 | 9 | 30.0 |
| Gestational age (in weeks) | 28 | 3 | 10.0 | 9 | 30.0 |
| | 30 | 4 | 13.3 | 3 | 10.0 |
| | 32 | 23 | 76.7 | 18 | 60.0 |

**In Table 2** indicates that most of the preterm neonates, i.e 100% preterm neonates in control group and none of them in experimental group were having severe pain .

**Table 3:** Mean, standard deviation and unpaired t-value of pain response during vein puncture with facilitated tucking (n=60)

| Parameters | | Control | | Experimental | |
|---|---|---|---|---|---|
| | | Frequency | % | Frequency | % |
| Facial expression | Relaxed | 0 | 0.0 | 25 | 83.3 |
| | Grimace | 30 | 100.0 | 5 | 16.7 |
| Cry | No cry | 0 | 0.0 | 21 | 70.0 |
| | Whimper | 11 | 36.7 | 9 | 30.0 |
| | Vigorous crying | 19 | 63.3 | 0 | 0.0 |
| Breathing pattern | Relaxed | 2 | 6.7 | 30 | 100.0 |
| | Change in breathing | 28 | 93.3 | 0 | 0.0 |
| Arms | Restrained/ Relaxed | 0 | 0.0 | 0 | 0.0 |
| | Extended | 30 | 100.0 | 0 | 0.0 |
| | Flexed | 0 | 0.0 | 30 | 100.0 |
| Legs | Restrained/ Relaxed | 0 | 0.0 | 0 | 0.0 |
| | Extended | 30 | 100.0 | 0 | 0.0 |

| | | | | | |
|---|---|---|---|---|---|
| | Flexed | 0 | 0.0 | 30 | 100.0 |
| State of arousal | Sleeping | 0 | 0.0 | 0 | 0 |
| | Awake | 12 | 40 | 30 | 100.0 |
| | Flussy | 18 | 60 | 0 | 0.0 |
| Pain level | Mild to no pain | 0 | 0.0 | 17 | 56.7 |
| | Mild to moderate pain | 0 | 0.0 | 13 | 43.3 |
| | Severe pain | 30 | 100.0 | 0 | 0.0 |

Table 3 shows that in experimental group mean pain level was 2.47and in control group 6, 17.the unpaired t test value was 20.76 proves that There was significant difference between mean pain level of neonates for control and experimental group as p value <0.05. Based on the p value of the findings $H_0$ is rejected as there was no significant difference between pain level in experimental and control group so $H_1$ was accepted as there was significant difference between pain level in experimental and control group.

## 5. Discussion

The result of the present study shows that there was a significant difference in the level of pain among the experimental and control group(<0.001)

The findings of different studies show that facilitated tucking is a non-pharmacological, effective and helpful technique for reducing pain during the procedure and result of study indicate that the mean pain scores of facilitated tucking position is (2.83 ± 1.18) and in the classical holding position (6.47 ± 1.07) ($p < 0.05$). [2]

Another supporting study was conducted to evaluate the use of facilitated tucking for non pharmacological pain management in preterm infants. Neonates demonstrated a lower mean heart rate 6–10 minutes post-stick ($p < 0.04$), shorter mean crying time ($p < 0.001$), shorter mean sleep disruption time ($p < 0.001$), and fewer sleep-state changes ($p = 0.003$) after heel stick with facilitated tucking than without. The study concluded that Facilitated tucking was helpful to preterm infants in reducing their painful reaction to procedures. [7]

A similar study was conducted to find the the effect of facilitated tucking during venipuncture on duration of crying in preterm infants in NICU. There was significant difference between duration of crying after sampling in the two groups, this duration were higher in control group than the experimental group (P<0.05).The study concluded that for reducing the duration of crying infant facilitated tucking was beneficial . [8]

Another supporting study was conducted to find the effectiveness of facilitated tucking in reducing pain during veinpuncture among preterm infants in NICU .The PIPP score was significantly lower ($M$ = 6·62, SD 2·598) than for the control group (6·62 ± 2·60 vs. 8·52 ± 2·99, respectively, $t = -2·202$, $p < 0·05$). At the end of the study it was found that reduced the PIPP scores in preterm infants with Facilitated tucking. [9]

## 6. Conclusion

The present study concludes that in control group with routine NICU method during vein puncture showed severe pain score during vein puncture and in experimental group facilitated tucking is a non-pharmacological, effective, inexpensive and safe pain management technique for reduction in pain during the vein puncture procedure

## 7. Recommendations

On the basis of the study, the following recommendations are being made:

- A similar study can be replicated in different setting to strengthen the findings.
- A comparative study can be conducted to compare the effectiveness of facilitated tucking with other non pharmacological pain relief measures.
- The study can be replicated with large sample in the same setting for reinforcement and can be concluded to assess the effectiveness of facilitated tucking on various other painful procedures.
- The result of this study can be implemented for both the full term as well as preterm neonates.
- The study can be done on association between various demographic variables, which are significant on larger sample.

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