

Effect of Facilitated Tucking on Physiological and Behavioural Responses to Pain among Infants Receiving Vaccination

Mercy Joseph¹, Reshma K. Sasi¹, Alphonsa Michael², Amrutha C.²

¹Lecturer, Department of Child Health Nursing, Amrita Vishwa Vidyapeetham., Kochi, Kerala, India,

²Vth Year B.Sc. Nursing, Amrita Vishwa Vidyapeetham., Kochi, Kerala, India

Abstract

Objective: To evaluate the effect of facilitated tucking on physiological and behavioural responses to pain among infants between experimental and control group before and after the IM vaccination

Method: A quantitative approach with true experimental design and consecutive sampling technique was used in this study. Researcher selected 100 infants up to the age of 6 month receiving IM vaccination in the immunization clinic, AIMS, Kochi, and they are randomly assigned to control and experimental group. Demographic and clinical data was collected using structured interview schedule. Heart rate and SPO₂ was monitored 2 minutes prior to the vaccination and facilitated tucking was given to the experimental group before and during the immunization and routine position was given to the control group, after that behavioural response was assessed by using neonatal infant pain scale and physiological response such as heart rate and SPO₂ was assessed after 5 minutes.

Result: The result showed that all the subjects in the control group had severe pain 100 %, whereas in the experimental group 50 % of the subjects had moderate pain and 50% of them had mild pain. Also there was a significant difference in the mean score of the physiological and behavioural response between the control and experimental group after the intervention

Conclusion: The study revealed that the Facilitated Tucking improves the emotional security and reduces the pain perception. The nurse or care givers can effectively implement facilitative tucking for reducing pain during vaccination in any setting as it is a very simple technique.

Keywords: *Facilitated tucking, behavioural response, physiological response.*

Introduction

Pain in newborns is a complicated, individualized, subjective, and universal finding¹. The most common painful procedures performed during infancy are routine injections without pain management². Vaccinations are first administered when babies are very young.

An immunological product used to confer active immunity to a person against a particular disease is called vaccination. The process of producing artificial immunity in a subject is called immunisation³. Studies have shown that uncontrolled pain experienced during the early stages of life has negative and long-term side effects, such as distress, and that such pain negatively affects the development of the central nervous system⁴.

The most important problem encountered while evaluating pain in newborns is the inability of babies to express pain verbally. Physiological parameters, behavioural method, and stress hormones have been evaluated to define the pain felt by newborns⁵. Pain experienced by newborns affects the heart rate, respiration rate, blood pressure, and tissue oxygenation,

Corresponding Author:

Ms. Mercy Joseph

Lecturer, Amrita College of Nursing, AIMS, Kochi, 682041, Kerala, India

e-mail: mercysanoj1@gmail.com

Ph. No.: 8281528714

potentially causing these parameters to decrease or increase ⁶.

Pharmacological method used to relieve pain in newborns are reported to have side effects. Non-pharmacological and pharmacological method are considered for pain relief by health staff⁷. One method of non-pharmacological method is the facilitated tucking; it is defined as “a sub-form of method of nesting the baby and the procedure of bringing the body to middle or even close position by holding the upper and lower extremities of the baby in flexion with hands.” An infant can be held in the lateral, supine, or prone position while this method is performed ⁸. It has been reported to prompt infants own regulatory systems, prevent painful stimulants coming from the outside world, and reduce the pain felt by the infant by enabling heat and touching stimuli ⁹. In addition, this method stabilizes infants physiological parameters and helps them gain a feeling of safety based on the position, supports their motor development, and preserves their energy ¹⁰.

A semi-experimental study was conducted on the effect of Facilitated Tucking (FT) during Venipuncture on duration of crying in preterm infants. In this study, 70 preterm infants born at average 32 to 36 weeks’ Gestational age (GA), who needed routine blood collection, were allocated to two intervention (35 neonates) and control (35 neonates) groups. In experimental group a nurse gave facilitated tucking to the infant. The results showed that the duration of crying after sampling in the two groups was statistically

significant difference, this duration in control group was higher than the intervention group ($P < 0.05$) The results of this study indicate that the facilitated tucking is effective in reducing the duration of crying infant.¹¹

The primary responsibility of a nurse is to ensure that pain-relieving method are performed before and after a procedure during routine practices in addition to determining and relieving the pain. The purpose of this study was to evaluate the pain perceptions of infants during vaccinations performed in the facilitated tucking position and the classical holding position respectively.

Method

The present study used the quantitative approach with true experimental design and consecutive sampling technique. After obtaining the ethical committee clearance from the institution and informed consent by the mothers researcher selected 100 infants up to the age of 6 month receiving IM vaccination in the immunization clinic, AIMS, Kochi, and they are randomly assigned to control and experimental group. Demographic and clinical data was collected using structured interview schedule. Heart rate and SPO2 was monitored 2 minutes prior to the vaccination and facilitated tucking was given to the experimental group before and during the immunization and routine position was given to the control group, after that behavioural response was assessed by using neonatal infant pain scale and physiological response such as heart rate and SPO2 was assessed after 5 minutes.

Results

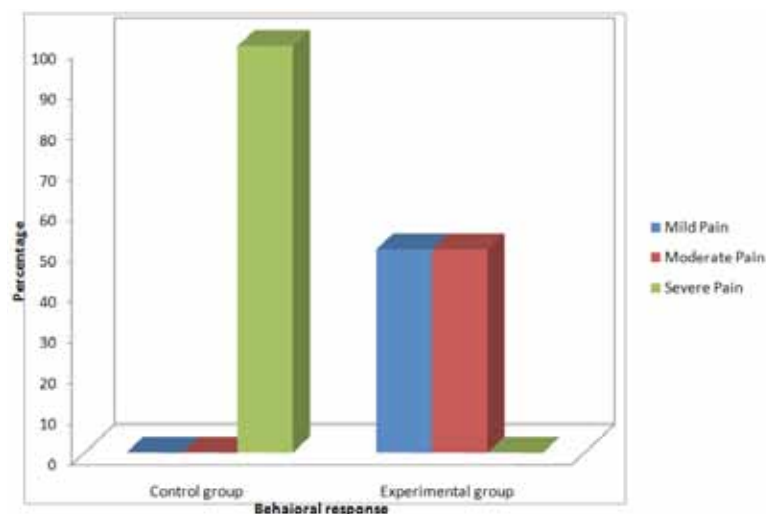


Fig 1: Distribution of subjects based on their behavioural response

The data depicts in the figure (1) shows that all the subjects in the control group had severe pain 100 %, whereas in the experimental group 50 % of the subjects had moderate pain and 50% of them had mild pain.

Table 1: Mean and standard deviation of physiological respons

	Control Group				Experimental Group			
	Min.	Max.	Mean	Sd	Min.	Max.	Mean	Sd
Heart rate before intervention	102	180	143.36	16.219	103	188	133.28	18.449
Heart rate after intervention	125	209	163.14	19.960	112	190	143.86	18.707
Oxygen saturation before intervention	97	100	99.82	.629	96	100	99.60	.857
Oxygen saturation after intervention	95	100	97.76	.938	97	100	99.16	.912

Table (2) shows that mean heart rate and SPO2 before and after the intervention in the control group were 143.36 +/-16.219, 163.14 +/-19.960, 99.82 +/--.629, 87.76 +/- .938, and the experimental group were 133.28 +/-18.449, 143.86 +/- 18.707, 99.60 +/- 0.857, 99.16 +/- 0.912 respectively .

Table 2 : Mean and standard deviation of behavioural response

	Control Group				Experimental Group			
	Min.	Max.	Mean	Sd	Min.	Max.	Mean	Sd
Behavioral response	6	7	6.92	0.274	6	7	6.92	0.274

The mean and standard deviation of behavioural response in the control and experimental group were 6.92 + 0.274, 6.92 + 0.274 respectively.

Table 3: Effectiveness of facilitated tucking on behavioural response

Behavioral response	t –value	Df	p value
Control group	-29.190	98	.0001**
Experimental group			

** : Highly significant

The above table (4) reveals that there was a significant difference in the mean score of the behavioural response between the control and experimental group after the intervention.

Table 4: Effectiveness of facilitated tucking on physiological response

Physiological response	t -value	df	P value
Heart rate	-4.983	98	.0001**
SPO2	7.568	98	.000**

** : Highly significant

The above table (5) reveals that there was a significant difference in the mean score of the physiological response between the control and experimental group after the intervention

Table 5 : Correlation between the behavioural and physiological response

Variable	r value	p value
Heart rate	0.489	0.001
Behavioral response		
SPO2	-0.630	0.001
Behavioral response		

Table (6) shows that there is a positive correlation between heart rate and behavioral response (r value is 0.489, p value is < 0.001 and there is negative correlation exists between SPO2 and behavioral response (r value is -0.630, p value is < 0.001)

Table 6: Association between physiological response with selected demographic variables

	Value	df	Level of significance
Age of the child	16.964	2	.0001**
Birth weight of the child	4.010	4	.405
Type of vaccine	18.721	2	.0001**
Order of vaccine	12.176	4	.016 *

*: Significant, **: Highly significant

The above table (7) reveals that there is a significant association between the physiological response and selected demographic and clinical variables such as age of the child, type of vaccine, order of vaccine.

Discussion

Facilitated Tucking is one of the simplest non pharmacological and cost effective techniques simulating the condition of being in uterus. This makes the infant comfortable, more secure with controlled response. It facilitates self-regulation by decreasing the physiologic response like prolonged heart rate elevation that contributes to the disequilibrium associated with pain and stress.

A study was conducted on a cohort of preterm infants (n = 42), divided into control (n = 21) and treatment (n = 21) groups, to determine the effect of facilitated tucking on pain relief during venipuncture on preterm infants in the neonatal intensive care unit. The severity of pain was measured using the Premature Infant Pain Profile score. The primary outcome measure was reduction in the Premature Infant Pain Profile scores. The Premature Infant Pain Profile score for the treatment group was significantly lower (M = 6.62, SD 2.598) than for the control group (6.62 ± 2.60, 8.52 ± 2.99 respectively, t = -2.202, p < 0.05).¹²

In the present study, the result shows that all the subjects in the control group had severe pain 100 %, whereas in the experimental group 50 % of the subjects had moderate pain and 50% of them had mild pain. Also there was a significant difference in the mean score of

the physiological and behavioural response between the control and experimental group after the intervention

The above two studies shows that the facilitating tucking is very effective way of non –pharmacological method for reducing pain in infants. Therefore, the health care professionals must identify the distress and discomfort shown by babies to routine immunization, regarding pain perception, assessment and management in infants.

Conclusion

Facilitated Tucking improves the emotional security and reduces the pain perception. The nurse or care givers can effectively implement facilitative tucking for reducing pain during vaccination in any setting as it is a very simple technique. This motivated the investigator to take up an initiative to teach the health care professionals to practice facilitated tucking while giving vaccination. In this study the investigator aims to assess the effect of facilitated tucking on physiological and behavioural responses of neonates undergoing IM vaccination and it was concluded that the non-pharmacological method used was very effective

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Conflicts of Interest: There is no conflict of interest

Ethical Clearance: Approval was sought from the ethical review committee of AIMS, Kochi. Written informed consent was obtained from the entire participant prior to the study. Needed steps were taken up to maintain the confidentiality while doing data collection.

Authors' Contribution: Author has substantially contributed for the study from the conception of the problem, data collection, analysis and drafting the manuscript.

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