



“A STUDY TO ASSESS THE EFFECT OF THE FACILITATED TUCKING POSITION ON INJECTION VITAMIN K INDUCED PHYSIOLOGICAL AND BEHAVIORAL RESPONSES OF NEWBORNS IN SELECTED HOSPITAL OF CITY.”

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ABSTRACT: *Backgorund:* Pain in newborns is a complicated, individualized, subjective, and universal finding. The most common painful procedures performed during infancy are routine injections without pain management. As the nurses working in labour wards are the one who administer the shot of Vitamin K, non-pharmacological neonatal pain control supports the identification of practical and accessible techniques that nurses can incorporate into their practice.

Objective of study: to evaluate the effect of facilitated tucking position in terms of variation of physiological and behavioral responses of newborn before, during and after administration of vitamin K.

Methodology: quasi-experimental pre-test, post-test control group design used in study. Stethoscope and NIPS scale used to measure physiological (heart rate) and behavioural responses (NIPS score) among newborns. This study conducted in selected hospital of pune city, the subject were 50 normal newborn among them 25 from control group and 25 from experimental group.

result: Tucking position is given by investigator in experimental group. The findings shows that NIPS score less in experimental group than control group. ($p>0.05$)

Conclusion: facilitated tucking position to newborn while administration injection helps to prevent long term consequence of painful stimulus; therefore improves development of newborn.

KEYWORDS: Facilitated Tucking Position, Physiological Response, Behavioural Response, Injection Vitamin K.

INTRODUCTION:

Pain in newborns is a complicated, individualized, subjective, and universal finding.¹ The most common painful procedures performed during infancy are routine injections without pain management.^{1,2} Injection Vitamin K is the first administered when babies are just exposed to extra uterine life. 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 system.^{3,4}

The response of newborn to pain has been described in terms of physiologic, behavioral, and biologic indicators. Pain is both sensory and emotional experience. Newborn babies experience pain similarly and probably more intensively than older children and adult. It is due to presence of the peripheral and central structure is functional at an early stage of gestation between first and second trimester that is necessary to respond the harmful stimuli. Pain causes increase demands on cardio respiratory and neurological system.⁵

There can also be adverse long term developmental sequel such as reduction of pain threshold and hyper analgesia. Strong evidence exists that newborns experience and responds to pain.^{6,7}

Pain in newborns is a complicated, individualized, subjective, and universal finding. The most common painful procedures performed during infancy are routine injections without pain management.^{8,9}

From birth newborn experiences, pain due to much intervention. The first invasive procedure is administration of injection Vitamin K. This intramuscular injection is mandatory procedure in each healthcare delivery setup.

OBJECTIVES:

1. To identify background variables of newborn.
2. To assess the physiological response of newborns in experimental group and control group before and after administration of injection Vitamin K.
3. To assess the behavioral response of newborns in experimental group and control group before, during and after administration of injection Vitamin K.
4. To evaluate the effect of facilitated tucking in terms of variations in physiological response and behavioral response of newborn by comparing experimental and control group.
5. To correlate selected background variables with behavioral responses (NIPS scores) and physiological response (Heart Rate) after intervention.

Hypothesis:

1. **H₁** : There is a significant difference in the mean score of physiological response (Heart Rate) of experimental group and control group at $p < 0.05$ level.
2. **H₂** : There is significant difference in the mean score behavioral response (NIPS scores) of experimental group and control group at $p < 0.05$ level.
3. **H₃**: There is significant correlation between the selected background variables (Gestational age, Gender, Birth weight) and physiological response (Heart Rate) of experimental group neonates at $p < 0.05$ level.
4. **H₄** : There is significant correlation between the selected background variables (Gestational age, Gender, Birth weight) and behavioral response (NIPS scores) of experimental group neonates at $p < 0.05$ level.

5. **H₅** : There is significant correlation between the selected background variables (Gestational age, Gender, Birth weight) and physiological response (Heart Rate) of control group neonates at $p < 0.05$ level.
6. **H₆**: There is significant correlation between the selected background variables (Gestational age, Gender, Birth weight) and behavioral response (NIPS scores) of control group neonates at $p < 0.05$ level.

ETHICAL CLEARANCE:

The Institutional ethical committee approved the topic of the study. The permission for conducting the study was taken from the respective Head of the medical department and medical department of local government (Municipal corporation). Before data collection, the methodology and the purpose of study was explained and there after consent was obtained from the subject (Mother of newborns).

CONCEPTUAL FRAMEWORK:

Conceptual Framework based on Melzack and Wall's (1965) Gate Control Theory of pain, to explain the phenomenon of facilitated tucking position and physiological and behavioral responses of newborns after injection Vitamin K.

METHODOLOGY:

Research Design: Quasi-experimental Pre-test, Post-test control group design

Variables of study:

Independent variable: facilitated tucking

Dependent Variable: Heart rate (Physiological response) and NIPS score (Behavioral response).

Extraneous Variables: gestational age of the newborn, gender, birth weight of the newborn, APGAR (Appearance, Pulse, Grimace, Activity, Respiration) score at 1 minute and 5th minute.

Setting of the study: The study was conducted in the labor ward, of two hospitals. One is private trust hospital and another hospital setting is governed by local government.

Population: normal newborns under going intramuscular injection Vitamin K administration procedure.

Sample and sampling: the total sample size for this study was 50 normal newborns, 25 in experimental group and 25 in control group.

Sampling technique: Non-Probability Purposive Sampling Technique

Sampling criteria:

Normal term newborns born vaginally after 37 weeks of gestation.

Newborn with APGAR score 7 and above at 1 and 5 minutes after birth.

Newborns with weight 2.5 kg (2500gm) and above.

Data collection technique and instrument:

1. Neonatal Infant Pain Scale (reliability $\alpha=.738$)
2. Stethoscope

Procedure for data collection: After recording of background variables, NIPS scores, and heart rate were marked before intervention in both the group. Investigator had washed her hand and performed warming of hands by rubbing the palm against palm to provide a sense of touch on the term newborn, gently turned the infant to the lateral side and positioned their arms and legs flexed, to the middle of the trunk new born was held in this tucked position for 30 second before procedure. The nursing staff performed the injection Vitamin K on the newborn in tucked position. During procedure investigator observed physiological response of newborn. The newborn was retained in facilitated tucking position 30 second after the injection procedure physiological and behavioral responses were observed by investigator. As the newborn was comfortable the newborn was un-tucked and placed in to pre procedural position.

The data related to back ground variables were collected from newborns in control group. During procedure of intramuscular injection Vitamin K administration the newborns were observed before, and after for physiological response (heart rate) and before, during and after for behavioral responses (NIPS scores) and recorded .

Score Interpretation:

Neonatal infant pain Scale

0 to 2 – No Pain

2 to 4 –Mild Pain

>4 – Severe Pain

DATA ANALYSIS AND INTERPRETATION:**I. Section 1:**

Findings related to background variable

N=50

Background variables	Experimental Group (n=25)		Control Group (n=25)	
	<i>F</i>	%	<i>f</i>	%
	Gender			
Male	11	44	11	44
Female	14	56	14	56
Gestational age in weeks				
37 weeks	6	24	1	4
38 weeks	12	48	12	48
39 weeks	5	20	6	24
40 weeks and above	2	8	6	24
Birth weight				
2500 grams	5	20	6	24
25001 to 3000 grams	16	64	15	60
Above 3000 grams	4	16	4	16

Table 1. Distribution of term newborns according to background variables.

II. Section 2:

- Findings related to physiological response (Heart Rate) of newborns

		Heart rate 120-170bpm	Heart rate >170bpm
Exp.group	Before intervention	30%	20%
	After intervention	22%	28%
Control group	Before intervention	34%	16%
	After intervention	30%	20%

Table-2. Findings related to physiological response (Heart Rate) of newborns

- Findings related to behavioral response before, during and after injection Vitamin K administration.

		NIPS score 0-2	NIPS score 2-4	NIPS score >4
Exp.group	Before intervention	72%	24%	4%
	after intervention	32%	20%	48%
Control group	Before intervention	72%	16%	12%
	After intervention	4%	8%	88%

Table-3. Findings related to behavioral response before, during and after injection Vitamin K administration.

III. Section 3:

- **Comparison of physiological response in experimental and control group.**

Facilitated tucking position does not have significant effect on physiological response ($p=0.3 > 0.05$).

N=50

Group	Mean(μ)	SD	SE	<i>df</i>	<i>T</i>	<i>p</i>
Control Group	1.4	0.5	.142	48.0	-1.1	0.3
Experimental group	1.6	0.5	.142			

* Significant at $p < .05$, two tailed

Table4: Comparison of physiological response in experimental and control group.

➤ **Comparison of behavioral response in experimental and control group.**

Facilitated tucking position have significant effect on behavioral response

($p=0.00 < 0.5$).

N=50

Group	Mean (μ)	SD	SE	<i>df</i>	<i>t</i>	<i>P</i>
Control Group	6.16	1.46	0.29			
				48.00	3.64	0.00*
Experimental group	3.92	2.71	0.54			

* Significant at $p < .05$, two tailed.

Table5: Comparison of behavioral response in experimental and control group.

Facilitated tucking position helps to reduce perceived pain by newborn induced due to administration injection Vitamin K. ($p=0.00 < 0.05$). **accepts H_2 There is significant difference in the mean score behavioral response (NIPS scores) of experimental group and control group at $p < 0.05$ level. And rejects H_0 There is no significant difference in the mean score behavioral response (NIPS scores) of experimental group and control group at $p > 0.05$ level.**

IV. Section 4

Correlation between selected back ground variables with behavioral responses was not found significant ($p > 0.05$). But Negative correlation was found between gestational age with physiological responses indicates as newborn with less gestational age will have increased physiological response to pain.

DISCUSSION :

In the assessment of physiological response (Heart Rate) of newborn in experimental and control group before administration of injection Vitamin K found that; in experimental group 15 (30%) newborns had heart rate in range of 120-170 bpm remaining 10(20%) newborns showed their heart rate above 170 bpm. In

control group 17(34%) newborn had heart rate in range of 120 -170 bpm. and it increases above 170 bpm in 8(16%) newborns .

After administration of injection Vitamin K found that; in experimental group 11 [22% ($\mu = 1.6$)] newborns had heart rate in range of 120-170 bpm remaining 14[28% ($\mu = 1.6$)] newborns showed their heart rate above 170 bpm. In control group 15 [30% ($\mu = 1.4$)] newborn had heart rate in range of 120 -170 bpm. and it increases above 170 bpm in 10 [20% ($\mu = 1.4$)] newborns .

In the assessment of behavioral response(NIPS, pain score)of newborn in experimental and control group after administration of injection Vitamin K found that ;control group newborn experience severe pain 22 [88%, ($\mu = 6.16$)] and in experimental group only 12[48% ($\mu = 3.92$)] newborn experience severe pain . This finding of pain difference between two groups related to the findings of effect of facilitated tucking on procedural pain control among normal newborns by O.Lopez; P. Subramanian;NRahmat; L.C. Theam; K Chinna; R Rosli.90

In the comparison of physiological response in control and experimental group after administration of injection Vitamin K it was found that; majority of newborns in experimental group had increase heart rate than newborns in control group. This finding does not supports to findings of study conducted by Liaw J; Yang L; Wang K; Chen C; Chang Y; et al a prospective randomized controlled crossover trial study for assessing effect non-nutritive sucking and facilitated tucking to relieve preterm infant pain during heel-stick procedures.86

In the correlation of selected background variable with physiological and behavioral response it was found that there is no correlation of selected background variable(gender , gestational age, birth weight) with behavioral response, but there is correlation of selected background variable (gestational age) with heart rate in the newborns who receive injection Vitamin K conventional position. This findings supports the findings of study conducted by BO Valeri and MBM Linhares.45

CONCLUSION:

The present study was aimed to assess the effectiveness of facilitated tucking position on pain induced physiological and behavioral response. The findings revealed that the mean pain score of post intervention level of behavioral response(NIPS, pain score)in experimental group was 3.92 with standard deviation 2.71

where as the mean pain score in control group was 6.16 with SD 1.46. the calculated “t” test value ($t=3.64$) was found to be statistically significant at $p<0.05$. hence this value indicates that this was reduction in the post intervention level of pain among term newborn who were in the facilitated tucking position during injection vitamin k administration.

Implications in nursing

- This interventions can be utilized by the practicing nurses in their daily clinical practice routine as a pain control measure.
- can be taught to mother where they can give gentle touch to their baby during painful procedure.

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“God has promised me to supply my needs and I am so grateful he has chosen you to supply them”.

Achie C

Words of gratitude create a lovely circle that returns at the right moment .Gratitude makes each one lives happier and our world and universe a more positive and forgiving environment.

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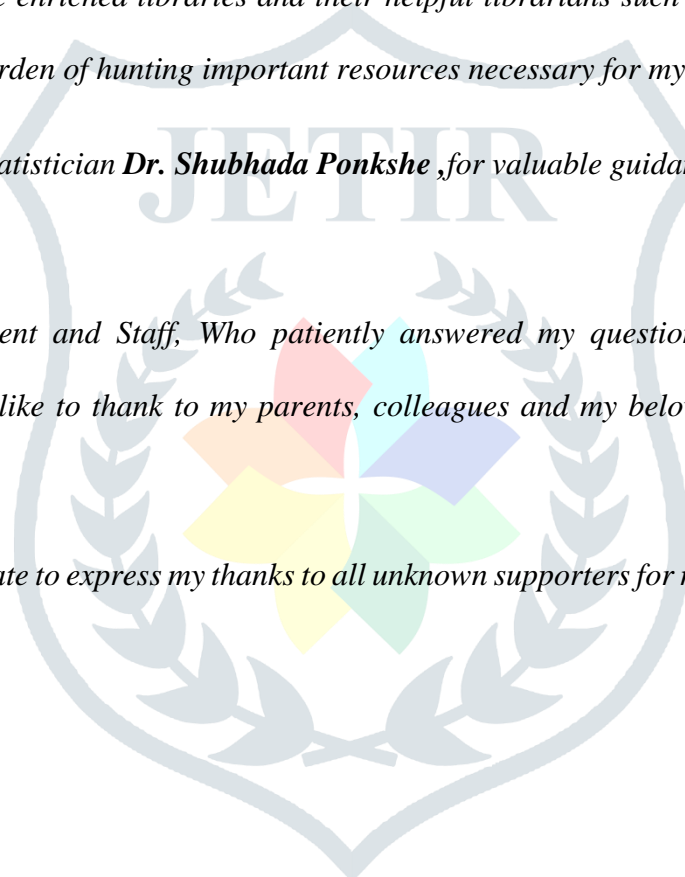
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