



EFFECTIVENESS OF SWADDLING ON PAIN MANAGEMENT AMONG HOSPITALIZED NEONATES UNDERGOING HEEL LANCING PROCEDURE AT SPECIAL NEWBORN CARE UNIT (SNCU) OF MEDICAL COLLEGE AND HOSPITAL, KOLKATA, WEST BENGAL.

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ABSTRACT

Introduction: Pain in neonates has been a large subject of debate within the medical profession for centuries. Neonates often require examinations and investigations for admission in the hospital. Non-pharmacological pain relieving methods such as swaddling is a most common effective method of pain reduction. **Methodology:** Non-equivalent control group pretest posttest quasi-experimental design was adopted. From the population of hospitalized neonates, 60 samples (30 in experimental group and 30 in control group) were selected by purposive sampling. Pain level and physiological parameters were assessed Neonatal Facial Coding System and Bio-physical Proforma. **Results:** The result showed that there was significant difference in level of pain ($t=2.11, p<0.05$) and physiological parameters ($t=4.04, p<0.05$) among experimental and control group after 3 minutes of heel lancing procedure. **Conclusion:** It can be concluded that swaddling is effective on pain management undergoing heel lancing procedure among hospitalized neonates.

KEYWORDS : Effectiveness, swaddling, pain, heel lancing procedure

INTRODUCTION

Pain is a subjective experience of neonates respond to pain with behavioural reactions that depend upon their age and cognitive process. The neonate's responds with total body movements associated with grievance and loud crying.^[1]

In the past, health professionals often claimed that neonates do not experience as much pain as adults. Due to lack of myelination of nerve fibres there was lack of transmission of pain in neonates. But, this belief was proved false by reviewing several papers. All neurotransmitters and receptors with pain modulation are present and responsive from 24 weeks post-conception age.^[2]

The most effective strategy is swaddling to reduce the pain of the neonates.^[3]

OBJECTIVES

1. To assess the pain level undergoing heel lancing procedure among hospitalized neonates with and without swaddling in experimental and control group.
2. To assess physiological parameters of neonates undergoing heel lancing procedure among hospitalized neonates with and without swaddling in both groups.
3. To evaluate the effectiveness of swaddling on the pain level, physiological parameters undergoing heel lancing procedure among hospitalized neonates in both groups.
4. To find out association between the level of pain and physiological parameters of neonates in control group and their selected demographic variables such as gender.

HYPOTHESIS

H₁ There is significant difference between the mean pain score of neonates during, after 1 minute and 3 minutes of heel lancing with and without swaddling procedure in experimental and control group at 0.05 level of significance.

H₂ There is significant difference between the mean score of physiological parameters changes of neonates before, during, after 1 minute and 3 minutes of heel lancing with and without swaddling procedure in experimental and control group at the 0.05 level of significance.

H₃ There is significant association between neonatal demographic variables and level of pain of neonates in

control group at 0.05 level of significance.

MATERIALS & METHODS

A Quantative Quasi-Experimental research approach was selected. The non-equivalent control group pre-test post-test quasi experimental research design was adopted through flipping of a coin. Head of the coin indicated experimental group and tail of the coin indicated control group. Record analysis proforma, NFCS scale and pulse oxymeter was used to collect data. Final data collected from 60 subjects (E=30 & C =30) from SNCU of Medical College & Hospital, Kolkata, West Bengal during 07.02.2022 to 05.02.2022. For the experimental group intervention (swaddling) was done for 1 minute prior to the heel lancing procedure for 3 minutes and the other group (control group) has no intervention. Pain level and physiological parameters of the neonates were assessed during, after 1 and 3 minutes of heel lancing procedure through video recording and findings were recorded.

Frequency and percentage distribution, mean, median and standard deviation were to be used to assess the demographic variables and physiological parameter & 't' test used to test the effectiveness of swaddling. Chi-square was intended to be used to determine the association between the level of pain in control group and their selected demographic variable (sex).

RESULTS

Table-1 Frequency And Percentage Distribution Of The Demographic Variables

N=60 (n_E=30 + n_C=30), E = Experimental group, C = Control group

Demographic Variables	Experimental Group		Control Group	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age				
0-14 days	16	53	14	47
15-28 days	14	47	16	53
Gender				
Male	16	53	12	40
Female	14	47	18	60
Gestational Age				

32 weeks - <34 weeks	7	23	5	17
34 weeks - <36 weeks	13	43	8	27
36 weeks - 38 weeks	8	27	10	33
More than 38 weeks	2	7	7	23
Birth Weight				
1500 gm - 1999 gm	4	13	8	27
2000 gm- 2499 gm	7	23	6	20
2500 gm - 3000 gm	13	44	11	36
More than 3000 gm	6	20	5	17

Data represent in Table 1 majority (53%) of the neonates were in the age group (0-14) days, regarding gender (53%), according to gestational age (43%) and 44% neonates having birth weight (2500 gm.-3000 gm) in experimental group.

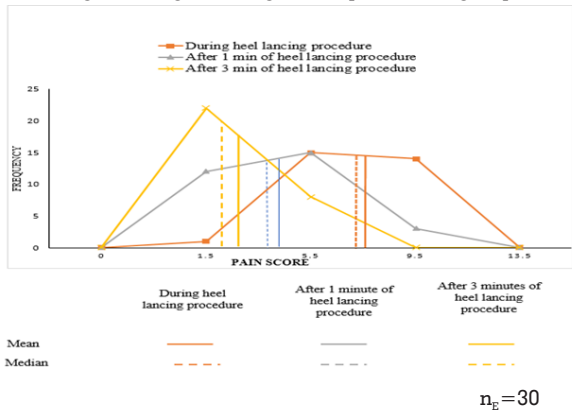


Figure-2 Frequency polygon showing pain level of neonates during, after 1 minute and 3 minutes of heel lancing with swaddling procedure in experimental group.

Data presented in figure-2 after 3 minutes of heel lancing procedure with swaddling, the mean pain score was 3.67, median and mode was 3, 3 so it showed positive skewness, it denoted as majority neonates (73.33%) had mild or no pain.

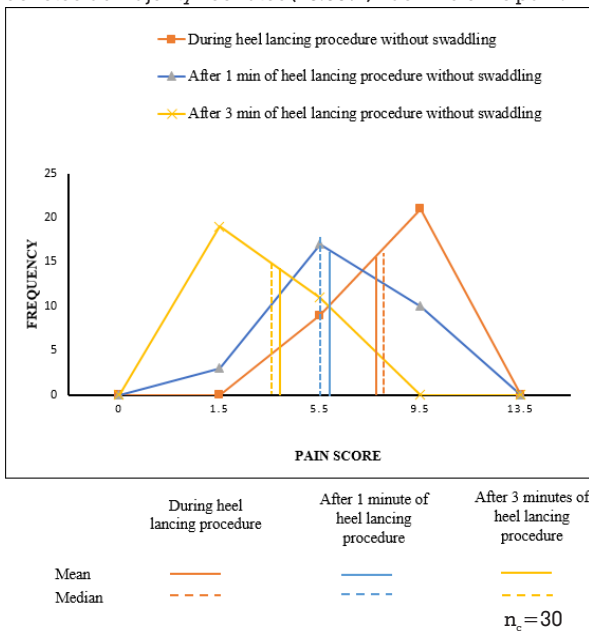
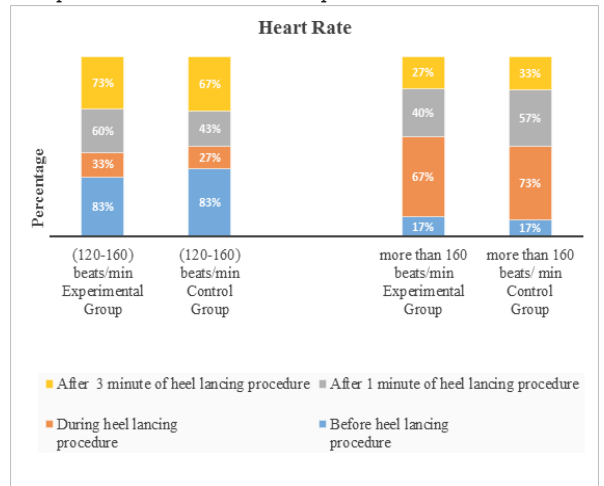


Figure-3 Frequency polygon showing pain level of during, after 1 minute and 3 minutes of heel lancing procedure without swaddling.

after 1 minute and 3 minutes of heel lancing without swaddling procedure in the control group.

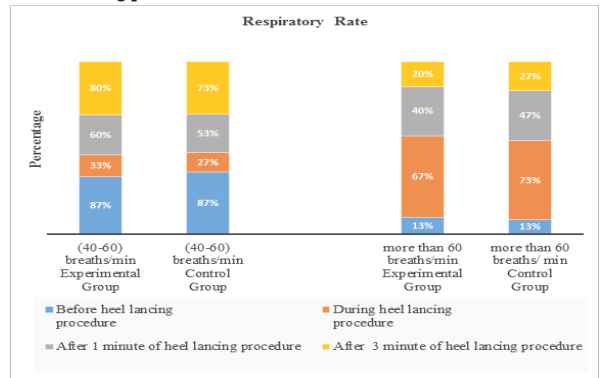
Data presented in figure-2 after 3 minutes of heel lancing procedure without swaddling, the mean pain score was 3.4, median and mode was 3, 3 so it showed positive skewness, it denoted as majority neonates that was 63.33% neonates had mild pain and 36.66% moderate pain.



N=60 (n_E=30 + n_C=30)

Figure-4 Bar diagram showing changes of heart rate of neonates before, during, after 1 minute and 3 minutes of heel lancing with and without swaddling procedure in experimental and control group.

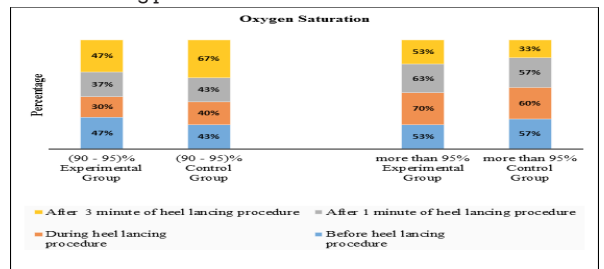
Data presented in figure- 4 swaddling was effective for returning back normal range of heart rate after 1 minute of heel lancing procedure.



N=60 (n_E=30 + n_C=30)

Figure-5 Bar diagram showing changes of respiratory rate of neonates before, during, after 1 minute and 3 minutes of heel lancing with and without swaddling procedure in experimental and control group.

Data presented in figure-5 swaddling was effective for returning back normal range of respiratory rate after 1 minute of heel lancing procedure.



N=60 (n_E=30 + n_C=30)

Figure-6 Bar diagram showing changes of oxygen saturation of neonates before, during, after 1 minute and 3 minutes of heel lancing with and without swaddling procedure in experimental and control group.

of neonates before, during, after 1 minute and 3 neonates of heel lancing with and without swaddling procedure in experimental and control group.

Data presented in figure-6 swaddling was effective for returning back more than 95% of oxygen saturation after 1 minute of heel lancing procedure.

Table 2 Mean, SD And Unpaired 't' Value Of Pain Score By Neonatal Facial Coding System Scoring Scale In Experimental Group And Control Group.

n=60(n_E=30 + n_C=30), E = Experimental group, C = Control group

	Group	Mean	Standard deviation	Mean deviation	t-value
During heel lancing procedure	Experimental Group	7.37	1.22	0.5	1.89
	Control Group	7.87	0.78		
After 1 minute of heel lancing procedure	Experimental Group	4.57	1.99	1.13	2.27*
	Control Group	5.70	1.87		
After 3 minutes of heel lancing procedure	Experimental Group	2.67	1.71	0.73	2.11*
	Control Group	3.40	1.04		

t_(df58) = 2.002, p < 0.05

Data represented in table 2 showed that there was statistically significant at df(58) and at 0.05 level of significance as evident from corresponding 't' value of 2.27 and 2.11 respectively. It can be concluded that swaddling was effective for pain management of hospitalized neonates undergoing heel lancing procedure.

Table 3 Mean, SD and unpaired 't' Value Of Physiological Parameters Changes Score In Experimental Group And Control Group.

n=60(n_E=30 + n_C=30)

	Group	Mean	Standard Deviation	Mean Deviation	t-value
Before Heel lancing procedure	Experimental group	6.23	0.77	0.40	2.00
	Control group	6.63	0.56		
During Heel lancing procedure	Experimental group	7.50	1.04	0.47	1.02
	Control group	7.97	0.72		
After 1 minute of heel lancing procedure	Experimental group	6.43	1.36	1.44	5.09*
	Control group	7.87	0.73		
After 3 minutes of heel lancing procedure	Experimental group	6.40	1.04	0.03	4.04*
	Control group	7.47	1.01		

t_(df58) = 2.002, p < 0.05 * significant

Data represented in table 2 showed that there was statistically significant at df(58) and at 0.05 level of significance as evident from corresponding 't' value of 5.09 and 4.04 respectively. It can

be concluded that swaddling was effective on physiological parameters changes of hospitalized neonates undergoing heel lancing procedure.

Table 4 Association Between The Level Of Pain Of Neonates During Heel Lancing Without Swaddling Procedure In Control Group And Their Selected Demographic Variables As Measured By Neonatal Facial Coding System Scoring Scale.

n_C = 30α

Demographic Variable	Pain score		Chi ² Value (χ ²)	df	P-value
	<Median	≥ Median			
Age					
0-14 days	6	8	0.09	1	0.77
15-18 days	6	10			
Gender					
Male	8	4	5.93	1	0.02*
Female	4	14			
Gestational Age					
<36 weeks	7	7	1.09	1	0.29
≥ 36 weeks	5	11			
Birth Weight					
< 2.5 kg	7	7	1.33	1	0.29
≥ 2.5 kg	5	11			

χ²_(df1) = 3.84, p < 0.05 * significant

Data presented in table 4 there was statistically significant association between neonatal demographic variables (gender) and the level of pain of neonates during heel lancing procedure without swaddling in control group as the calculated chi square value (5.93) was higher than table value of chi square (3.84 with 1 df) at 0.05 level of significance (including Yates correction).

DISCUSSION

The finding of the current study showed that, mean pain score in both experimental and control groups had consistently increased over time but the mean pain score in control group (7.87) higher than experimental group (7.37). Hospitalized neonates who was received swaddling intervention had high ability to control pain (t = 2.27, p < 0.05) than hospitalized neonates who did not receive the intervention. The finding of the current study was supported by the study conducted by O'Rorke D et al.⁽⁴⁾ who conducted the study on pain management among hospitalized neonates and mentioned that hospitalized neonates in the intervention group had better pain management than control group (p < 0.05).

In the present study it was found that hospitalized neonates who received swaddling intervention had high ability to keep heart rate between (120-160) beats/min that was 73.33% after 3 min of heel lancing procedure. The finding was congruent with the study of Stadler J.⁽⁵⁾ on effect of swaddling on physiological parameters changes during heel lancing procedure among newborns and it was found that hospitalized neonates who received the intervention had better ability to keep heart rate between (120-160) beats/min than hospitalized neonates in the control group (p < 0.05).

CONCLUSION

On the basis of the findings of the present study it can be concluded that swaddling is effective for pain management among hospitalized neonates undergoing heel lancing procedure. Providing swaddling to the hospitalized neonates undergoing heel lancing procedure to be beneficial in improving the pain management ability of hospitalized neonates.

REFERENCES

1. Carbajal R, Rousset A, Danan C, Coquery S.(2008) Episeimology and treatment of painful procedures in neonates in intensive care units. JAMA: the journal of the American Medical Association. 300(1), 60-70.
2. Huang, C.M., Tung, W.S., Kuo, L.L., & Chang, Y.J (2004). Comparison of pain responses of premature infants to the heelstick between containment and

- swaddling. *Journal of Nursing Research*, 12(1), 31-35.
3. Witt N, Coynor S, Bradshaw H. (2016) A guide to pain assessment and management in the neonate. 4(1), 1-4.
 4. O'Rorke D. (2004) The measurement of pain in infants, children and adolescents: from policy to practice. 85(2), 560-570.
 5. Ngoc HV. (2020) Analgesic effect of non-nutritive sucking in term neonates: A randomized controlled trial. 61(1), 106-113.