A PILOT STUDY ON EFFECTIVENESS OF SELECTED INTERVENTIONS ON PAIN PERCEPTION AND PARENTAL SATISFACTION AMONG INFANTS RECEIVING IMMUNIZATIONS AT PUBLIC HEALTH CENTRE, CHENNAI.

Nursing

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ABSTRACT

An experimental post test only control design was used to assess the effectiveness of selected interventions on pain perception and parental satisfaction among infants receiving immunizations at Public Health Centre, Chennai. Using simple random sampling method, the total of 40 infants were allocated in four groups where each group had 10 infants. The interventions provided are oral sucrose for Experimental group I, 4 S's technique for experimental group II, oral sucrose with 4 S's technique for Experimental group III and routine care for Control group. The data collection tool consists of demographic profile, modified riley pain scale and parental satisfaction likert scale were used to collect data. The result of the study revealed that mean pain perception of experimental group III (3.21) was less than the experimental group I (4.08), experimental group II (3.40) and control group (4.22). There was no statistical difference between experimental group II and experimental group III at the level of 0.693 and also between experimental group I and control group at the level of 1.000 when other groups had statistically significant difference in pain perception. In mean parental satisfaction, the experimental group III (43.20) had high parental satisfaction than the experimental group I (39.80), experimental group II (41.90) and control group (38.60). Hence the pilot study concluded that 4S's technique was the effective intervention for infant immunizations.

KEYWORDS

Immunization, pain perception, parental satisfaction, 4 S'S technique, oral sucrose

INTRODUCTION

Immunizations are the most common preventive painful paediatric procedure. As a routine by the end of age 2 years, the infants are immunized with more than 20 injections. Despite, aiming for 100% immunization coverage, the immunization pain is left unassessed and untreated. Unlike the widely held belief of the past years, today it is accepted that small children and even newborns were able to feel, response and remember pain.

Mohammad, H, & Sahebihag (2014) stated that vaccination pain in infants causes short term and long term effects. The short term effect leads to hemodynamic instability, increase in intracranial pressure and decline in oxygenation. The long term effect of uncontrolled pain experienced by infants that brings some changes in the central nervous system are permanent impairment in the cognitive development of learning, memory, intelligent quotient and behavior and also leads to increase in physical impairment, anxiety, emotional complications, hyperactivity and disturbed attention in childhood.

Sahare, B. (2012) studied the effectiveness of oral sucrose solution for pain perception in infants during first intramuscular injection in hospital at Jawaharlal Nehru Hospital and Research centre, Bhilai. The research design adopted for the study was pre experimental design. The total of 150 infants who received first intramuscular injection were selected based on purposive sampling who met the selection criteria. The 75 infants in experimental group received oral sucrose and 75 infants in control group received routine care. The study findings revealed that there was significant difference in mean pain score of experimental and control group by using 't' test, the value was 5.47 was significant at the level of $p < 0.05$. There was no significant difference on the pain during first intramuscular injection in relation to the age, sex, body mass index and presence of care giver.

In 2012 study published in the journal of American academy of Pediatrics by Harrington, J. on physical intervention for immunization. The study was conducted in Children's Hospital of the King's Daughters and Eastern Virginia Medical School where researcher found that use of Karp's 5S's techniques was as effective as the commonly used analgesic sucrose. The results of the study of 230 children over a six-month period revealed that the 5S's physical

intervention was the most effective both in reducing the length of time a baby cried after a vaccination and also in the pain they experienced as measured on a modified Riley pain scale.

The investigator with practical experiences observed that infants suffer varying levels of pain during immunizations which emotionally upsets the mother and even the staff involved in procedure. It is crucial to find method to relieve the pain when administering immunizations to the infants. Perhaps, the pain not be completely eliminated, the effective pain management for immunizations will reduce the pain to the lowest level as possible. Therefore, the researcher is interested to find out the effectiveness of selected interventions on pain perception and parental satisfaction among infants receiving immunizations in the present pilot study.

MATERIALS AND METHODS

The study adopted quantitative research approach and true experimental post test only control design. The pilot study was conducted with formal written permission of the concerned authorities. Ethical clearance was obtained from the ethical committee of Public Health Centre, Chennai. Data was collected between February and March 2015. The sample size was 40 Infants, 10 each in experimental group I, experimental group II, experimental group III and control group were selected by using simple random sampling-lottery method. Inclusion criteria include infants aged between 1 and 4 months, who are accompanied by mother, immunized with pentavac and pneumococcal vaccine. Exclusion criteria consist of infants having neurological disorder, congenital anomaly, fever, illness, anaphylactic reaction to previous vaccine and prior participation in trial. Informed consent was obtained from the mother to participate in the study. After that demographic data consists of age of infant, gender, birth weight, gestational age, birth order, early pain experience, medical condition, person accompanied, dose of immunization, last feeding, last sleep, actual weight, actual length, mothers age, mothers education and mothers occupation were collected. The interventions given for four groups are 2 ml of oral sucrose 2 minutes before immunization and comfort by mother after immunization for experimental group I, 4 S's technique provided after immunization for experimental group II, 2 ml of oral sucrose 2 minutes before

immunization and 4 S's technique provided after immunization for experimental group III and routine care for control group. 25% oral sucrose solution was given to the infants using a 2ml sterile syringe. For 4 S's technique, the infant have to be placed in the blanket underneath during the immunization to facilitate the swaddling, then performer has to swaddle the infant within 15 seconds post vaccination, begins side lying, swinging and shushing into the infant's ear simultaneously. The stop clock was started immediately after the injection of last vaccination. Post vaccination pain was assessed every 15 second intervals for 2 minutes and then every 30 seconds for maximum of 5 minutes using modified riley pain scale. Modified Riley infant pain scale was used to measure the post vaccination pain of the infant which was based on three behaviours are facial grimace, body movements and quality of cry with each behavior carried minimum score of 0 to maximum score of 3 consists of highest total pain score was 9 and the lowest pain score was 0. Parent satisfaction likert scale was used to assess the satisfaction of the mother. Parent satisfaction likert scale had 10 positive statements contains options with scoring were very satisfied with 5, satisfied with 4, unsure/neutral with 3, dissatisfied with 2 and very dissatisfied with 1.

Table 1: Mean and standard deviation of pain perception of four groups

Timings in seconds	Control group		Experimental group I		Experimental group II		Experimental group III		Oneway ANOVA p-value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
15 sec	9.0	.20	8.8	.42	8.3	.48	8.4	.52	P≤0.001
30 sec	8.2	.42	8.2	.42	7.7	.48	7.3	.82	P≤0.01
45 sec	7.8	.42	7.4	.52	6.7	.48	6.6	.52	P≤0.001
60 sec	7.4	.52	6.8	.42	5.9	.74	5.2	.63	P≤0.001
75 sec	6.8	.00	6.1	.32	4.8	.79	4.3	.67	P≤0.001
90 sec	5.7	.48	5.1	.32	3.8	.79	3.3	.67	P≤0.001
105 sec	3.6	1.03	3.0	1.58	2.3	1.64	2.6	1.43	P≤0.001
120 sec	2.8	.79	2.4	.97	1.3	1.49	0.9	1.45	P≤0.01
150 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
180 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
210 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
240 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
270 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
300 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
330 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
360 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
390 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
420 sec	0	0.0	0	0.0	0	0.0	0	0.0	P = 1.00
Overall	4.22	0.12	4.08	0.17	3.40	0.27	3.21	0.37	P≤0.001

Table 1 revealed that overall mean pain perception of experimental group III (3.21) was less than the experimental group I (4.08), experimental group II (3.40) and control group (4.22).

Table 2: Mean, SD and F-value of Parental satisfaction Likert scale of four groups

Groups	Mean	Std. Deviation	One way ANOVA F-test
Control group	38.60	1.96	F=10.78 P=0.001
Experimental group I	39.80	2.14	
Experimental group II	41.90	2.08	
Experimental group III	43.20	1.75	

Table 2 indicates the high parental satisfaction mean score (43.20) in experimental group III when compared to experimental group I (39.80), experimental group II (41.90) and control group (38.60) and also showed that there is a significant difference between groups on parental satisfaction, it was calculated using one way analysis of variance F-test, the value F=10.78 at P=0.001.

Table 3: Multiple comparison of pain perception within four groups using Bonferroni t-test

S. No	(I) Group	(J) Group	Mean Difference (I-J)	Sig.
1	Control group	Experimental group I	.150	1.000
		Experimental group II	.825*	.000
		Experimental group III	1.008*	.000

RESULTS

Demographic data: By using chi square test, similarities of demographic features of the study participants between groups were assessed. There was no significant difference in demographic variables between experimental group I, experimental group II, experimental group III and control group.

Fig 1: Mean Pain Score over time in seconds

Fig 1 showed the graphical representation of mean pain score of every 15 seconds for 2 minutes in experimental group I, experimental group II, experimental group III and control group.

2	Experimental group I	Control group	-.150	1.000
		Experimental group II	.675*	.000
		Experimental group III	.858*	.000
3	Experimental group II	Control group	-.825*	.000
		Experimental group I	-.675*	.000
		Experimental group III	.183	.693
4	Experimental group III	Control group	-1.008*	.000
		Experimental group I	-.858*	.000
		Experimental group II	-.183	.693

Table 3 indicated that in pain perception, there was no statistical difference between experimental group II and experimental group III at the level of 0.693 and also between experimental group I and control group at the level of 1.000 where statistically significant differences between other groups were present.

Table 4: Multiple comparison of Parental satisfaction Likert scale within four groups using Bonferroni t-test

S. No	(I) Group	(J) Group	Mean Difference (I-J)	Sig.
1	Control group	Experimental group I	-1.200	.867
		Experimental group II	-3.300*	.001
		Experimental group III	-4.600*	.000
2	Experimental group I	Control group	1.200	.867
		Experimental group II	-2.100	.079
		Experimental group III	-3.400*	.001
3	Experimental group II	Control group	3.300*	.001
		Experimental group I	2.100	.079
		Experimental group III	-1.300	.689

4	Experimental group III	Control group	4.600*	.000
		Experimental group I	3.400*	.001
		Experimental group II	1.300	.689

Table 4 indicated that in parental satisfaction, there was no statistical difference between experimental group I and control group, experimental group I and experimental group II, experimental group II and experimental group III where statistically significant difference between other groups were present.

Table 5: Correlation between pain perception and parental satisfaction

N=40(10+10+10+10)

Groups	Mean±Std. Deviation (Pain perception Vs Parental satisfaction)	Karl pearson Correlation coefficient
Control group	6.34±0.19 Vs 38.60±0.97	r=-0.25 P=0.01***
Experimental group I	6.11±0.26 Vs 39.80±2.15	r=-0.29 P=0.01***
Experimental group II	5.10±0.40 Vs 86.00±5.16	r=-0.35 P=0.001***
Experimental group III	4.82±0.56 Vs 87.00±6.75	r=-0.43 P=0.001***

Table 5 showed the correlation between pain perception and parental satisfaction which was significant negative fair correlation in control group and experimental group I where significant negative moderate correlation in experimental group II and experimental group III revealed that pain perception decreases with parental satisfaction increases fairly and moderately.

Association of pain perception and parental satisfaction with socio demographic variables: Based on chi square test, it was evident that there was no statistical significant association between pain perception and socio demographic variables and also between parental satisfaction and socio demographic variables

DISCUSSION

The present study was intended to find out the effectiveness of selected interventions on pain perception and parental satisfaction among infants receiving immunizations. The findings revealed that 4 S'S technique with or without oral sucrose was effective intervention in reducing pain perception of infants and improves satisfaction of the mothers of infants receiving immunization. These findings of the study was supported by Harrington,J.(2012) on effectiveness of 5 S's technique on immunization carried out with 230 infants during routine immunizations at 2 and 4 months.

CONCLUSION

The result of the present study concluded that the 4 S's technique is the effective physical intervention for the infant receiving immunization in terms of simple, safe and cost effective. Therefore 4 S's technique is to be provided as the part of routine nursing care during immunization of the infants.

Recommendations

Similar studies to be done with large samples and other pain relieving interventions for immunization to be used.

Mothers of infant to be involved in providing pain relieving intervention during immunization.

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