



Effect of Cough Trick Technique on Vaccination Prick Pain among Preschool Children

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Authors' contributions

This work was carried out in collaboration between both authors. Author PT designed the study, wrote the protocol, managed the analyses and wrote the first draft of the manuscript. Author AB managed the literature searches and performed the statistical analysis of the study. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: To determine the effectiveness of the Cough trick technique on vaccination prick pain among preschool children.

Study Design: Quantitative approach with true experimental research design.

Place and Duration of Study: Pranav baby clinic, Chennai, from May 2021 to June 2021.

Methodology: True experimental post-test only research design was adopted to conduct the study with a samples of 40 children. Children were randomly allocated into the experimental group (n=20) and the control group (n=20). Demographic variables were collected from mothers of preschoolers using a structured questionnaire. The cough trick technique was administered to the experimental group during intramuscular vaccination whereas the control group received the regular technique of the intramuscular vaccination. The post-test level of pain was assessed by FLACC scale for both the group. The data were tabulated and analyzed by descriptive and inferential statistics using SPSS statistical package.

Results: The result of the study shows that in the experimental group, 14(70%) had mild pain and 6(20%) had no vaccination prick pain whereas in the control group, 14(70%) had severe pain and

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6(20%) had moderate vaccination prick pain. Independent't' test reveals that there is a significant difference in the level of pain after administration of the cough trick technique between the experimental and control at the level of $P < 0.05$.

Conclusion: The finding of the present study concludes that cough trick technique is an effective and easy method to minimize and reduce the pain during intramuscular vaccination. It is a simple distraction technique that can be effective in helping children cope with the pain of immunization.

Keywords: Cough trick technique; distraction technique; intramuscular; non-pharmacological pain reduction; pain; preschooler.

1. INTRODUCTION

Pain is a global health problem that exists from birth to the last stage of life. Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage [1]. Pediatric pain was been recognized as a major challenge for health care personnel while caring the pediatric clients. Injections for vaccinations, the most common source of iatrogenic pain in childhood [2]. In hospital settings, children experience pain because of different causes. Medical procedures, particularly needle insertions, are among the most feared experiences reported by children. Injections are the most frequently used medical procedure in the health care settings globally. The pain associated with injections is a source of distress for children, their parents, and those administering the injections. If not considered, it can lead to pre-procedural anxiety in the future, needle fears and health care avoidance behaviors, including non-adherence with vaccination schedules [3]. It is estimated that up to 25% of adults have a fear of needles [4], with most fears developing in childhood [5]. About 10% of the population avoids vaccination and other needle procedures because of needle fears [3]. In India 77.2% of rural and 80 % of urban children are immunized with vaccines annually. However, the children vaccinated will experience severe to moderate pain.

A number of strategies such as local anesthetics (LA), ethyl chloride, ice, or even distraction to reduce intramuscular pain have been developed to optimize patient comfort and satisfaction [6,7]. Those strategies stimulate nerves in the skin near the injection site with a device or through pinching, rubbing, or stroking. Although they are effective, nearly all of the existing strategies require increased time, cost, and/or effort on the part of clinic staff members or patients [8-15]. Cough trick is one of the non-pharmacological pain management strategies. Cough-trick”

(CT)—coughing on command simultaneously to skin puncture—is a simple effective method of pain relief during peripheral venipuncture and various injections [16–18] which is confirmed by several investigations. The underlying mechanisms of the pain reduction effects of CT still remain unclear; however it could be the activation of the segmental pain inhibitory pathways due to the increased pressure in the subarachnoid space during coughing mediated by vagal afferents [19–21].

Investigators found that during their clinical experience most of the children receiving a vaccination were anxious and had fear of injections due to pain and discomfort. Reviewing the literature considering the previous study findings which proven that cough trick helps in reduction of pain as well it is simple and easy applicable non-pharmacological management of pain. Hence the study was conducted with the aim to determine the effectiveness of the cough trick technique to reduce vaccination prick pain during vaccination among preschool children.

2. METHODS AND MATERIALS

True Experimental Study – posttest only design was adopted to conduct the study at Pranav Baby Clinic with 40 Preschool children. Children who met the inclusion criteria were selected randomly and allocate into the experimental group (n=20) and the control group (n=20). Preschool children under age group 3 - 6 years receiving immunizations intramuscularly and their mothers willing to give consent to participate in the study were included in the study. The exclusion criteria were uncooperative children, impaired cognitive function, history of peripheral neuropathy; and abnormal skin conditions (infection, scars, psoriasis, or eczema) at the site of injection. An investigator introduced herself and explained the purpose of the study and their right to participate or withdraw from the study to the mothers of the preschoolers. The consent was obtained after assuring confidentiality.

Demographic variables were collected from mothers of the preschoolers using a structured questionnaire. The Cough trick technique was administered to the experimental group during intramuscular vaccination. The children were instructed to cough with moderate force as a test cough. Immediately after, in a second cough, an investigator administered vaccine intramuscularly, which coincided cough with the needle puncture. Whereas the control group participants received the intramuscular vaccination in regular technique. The post-test level of pain was assessed by FLACC scale for both the groups. FLACC scale is a standardized scale as well an observation checklist of Face, Legs, Activity, Cry, and Consolability and interpreted as 0: - no pain, 1-3: mild pain, 4-6: moderate pain, 7-10: severe pain Confidentiality was maintained throughout the study. The data were tabulated and analyzed by descriptive and inferential statistics using SPSS statistical package. A probability of 0.05 or less was taken as statistically significant.

3. RESULTS

3.1 Demographic Characteristics of Preschooler

The findings of the current study show that preschool children in the experimental group, 10(50%) were aged between 5 – 6 years, 12(60%) were male, 14(70%) belonged to a nuclear family, 6(30%) of caregivers had high school education, 12(60%) were first born child, 16(80%) were vaccinated till date, 11(55%) of

children cried frequently during injection and 18(90%) had no previous knowledge about pain reduction interventions. In the control group, 11(55%) were aged between 3 – 4 years, 13(65%) were female, 13(65%) belonged to a nuclear family, 6(30%) of caregivers were graduate and above, 10(50%) were first born child, 18(90%) were vaccinated till date, 15(75%) of children cried frequently during injection and all 20(100%) had no previous knowledge about pain reduction interventions as depicted in Table 1.

3.2 Level of Vaccination Prick Pain

The below Table 2 shows that in the experimental group, 14(70%) had mild pain and 6(20%) had no vaccination prick pain among the preschool children. Whereas in the control group, 14(70%) had severe pain and 6(20%) had moderate vaccination prick pain among the preschool children.

The table 3 depicts that in the experimental group mean score of vaccination prick pain was 1.75 with standard deviation 1.20 and the mean score of vaccination prick pain in the control group was 7.50 with standard deviation 1.36. The calculated student independent 't' test value of $t = 13.719$ was found to be statistically significant at $p < 0.01$ level. This clearly infers that cough trick technique administered to preschool children in the experimental group was found to be effective in reduction of vaccination prick pain than the preschool children in the control group.

Table 1. Frequency and percentage distribution of demographic variables of preschool children in the experimental and control group

Demographic Variables	Experimental Group		Control Group	
	No.	%	No.	%
Age of the child in years				
3 – 4	6	30.0	11	55.0
4 – 5	4	20.0	7	35.0
5 – 6	10	50.0	2	10.0
Gender				
Male	12	60.0	7	35.0
Female	8	40.0	13	65.0
Type of family				
Nuclear family	14	70.0	13	65.0
Joint family	6	30.0	7	35.0
Caregivers literacy level				
No formal education	3	15.0	5	25.0
Primary education	3	15.0	2	10.0
High school	6	30.0	3	15.0

Demographic Variables	Experimental Group		Control Group	
	No.	%	No.	%
Higher secondary	3	15.0	4	20.0
Graduate and above	5	25.0	6	30.0
Birth order				
First child	12	60.0	10	50.0
Second child	8	40.0	7	35.0
Third and above	-	-	3	15.0
Have you vaccinated till date?				
Yes	16	80.0	18	90.0
No	4	20.0	2	10.0
Do your child cry frequently during injection?				
Yes	11	55.0	15	75.0
No	9	45.0	5	25.0
Previous Knowledge about pain reduction interventions				
Yes	2	10.0	-	-
No	18	90.0	20	100.0

Table 2. Frequency and percentage distribution of level of vaccination prick pain among preschool children in the experimental and control group

Vaccination prick pain	No Pain (0)		Mild Pain (1 – 3)		Moderate Pain (4 – 6)		Severe Pain (7 – 10)	
	No.	%	No.	%	No.	%	No.	%
Experimental	6	30.0	14	70.0	0	0	0	0
Control	0	0	0	0	6	30.0	14	70.0

Table 3. Comparison of posttest level of vaccination prick pain between experimental and control group

Vaccination Prick Pain	Mean	S. D	Student Independent 't' test Value
Experimental Group	1.75	1.29	t = 13.719
Control Group	7.50	1.36	p = 0.000 S***

***p<0.001, S – Significant

3.3 Association between Posttest Level of Vaccination Prick Pain with Selected Demographic Variables of Preschooler in both Experimental and Control Group

Chi-square test reveals that none of the demographic variables had not shown statistically significant association with level of vaccination prick pain among preschool children in both the experimental and control group.

4. DISCUSSION

Pain from vaccine injection is common and is a source of distress for individuals of any age especially children as well as for the immunization provider. The main concern is to minimize the vaccination prick pain by diverting the focus of children from vaccine injection. The aim of the management is to reduce the level of

pain as it cannot completely alleviate but can reduce the threshold of pain. The main focus of the study was to determine the effectiveness on cough trick technique on intramuscular vaccination prick pain. The findings of the current study demonstrated that there is a significant reduction in the level of vaccination prick pain after implementation of the cough trick technique. The study findings is supported by the study conducted by Kumar VS et al which concluded that the cough trick can be an effective strategy for the reduction of pain for male adolescent children undergoing routine immunizations [17]. A study by G Betty Lebona G et al found that there is a reduction in the percentage of pain when compared to the control group [22]. Dustin P Wallace also concluded that the cough trick can be an effective strategy for the reduction of pain for some children undergoing routine immunizations [18]. Taras I. Usichenko reported

that the cough trick technique is effective reducing pain during venipuncture in comparison with two distraction methods, as well as under the influence of naloxone among healthy volunteers [23]. Similarly in another study by Ramandeep Kaur et al also reported that there is a significant decrease in pain score in the cough trick method group as compared to the conventional care group among (6-12yrs) old children undergoing intravenous cannulation. This reduction in the pain results in judicious application of this intervention as it is one of easiest non-pharmacological method in managing pain due to intravenous cannulation [24]. These supportive study findings are in accordance with the present study. The Cough trick technique is effective in reducing pain during needle puncture of intramuscular and intravenous for all age group people, However, further research study can be done by comparing the effect of the cough trick between children and adults with large samples. The present study found that few children had severe pain due to individual differences in perception of pain and distraction. This intervention can be implemented in both hospital and community setting as it is very simple, cost-effective, feasible and has no side effects when compared to pharmacological management of pain and as a significant means of reducing vaccination prick pain.

5. CONCLUSION

The finding of the present study concludes that the cough trick technique is an effective and easy method to minimize and reduce the pain during intramuscular vaccination. It is a simple distraction technique that can be effective in helping children cope with the pain of immunization as well can be applied in any invasive procedure. The strategy requires no equipment, not time consuming, cost-effective, feasible, and minimum training for parents, children, and nursing staff members.

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CONSENT

The participants were explained the purpose of the study and written consent was obtained from the care-givers of the preschool children.

ETHICAL APPROVAL

This study was ethically cleared and approved by the Institutional Scientific Review Board (ISRB) with reference of 512/2021/ISRB/SCON dt 21.01.2021.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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