

Incorporation of Storytelling as a Method of Oral Health Education among 3–6-year-old Preschool Children

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ABSTRACT

Purpose: To find the effectiveness of storytelling as a method of oral health education among 3–6-year-old preschool children.

Design: A non-randomized experimental pre–post study design.

Setting: Preschools located in urban Bengaluru.

Subjects: Two hundred, 3–6 years, preschool children.

Intervention: An age-appropriate story with oral health messages was delivered using hand puppets during the storytelling session in preschool.

Measures: A self-administered 11-item picture-based, closed-ended questionnaire assessed children's knowledge and attitude at baseline and post-intervention. A 1-week audit sheet to monitor the brushing, eating, and mouth rinsing pattern was administered for the parents to measure the change in behavior post-intervention.

Analysis: Change in KAP mean scores was assessed using the "Wilcoxon Sign Rank test" at $p < 0.05$. "Cohen's d " was used to calculate the "Effect size".

Results: Significant improvement was observed in mean KAP score (pre 7.52 ± 1.95 post 8.60 ± 1.55 , $p = 0.0001$) with effect size 0.2. There was a significant increase in the knowledge and attitude and practice score, knowledge (pre 2.97 ± 1.02 , post 3.63 ± 0.78 , $p = 0.0001$, effect size: 0.3), attitude (2.27 ± 0.81 , 2.77 ± 0.60 , $p = 0.000$, effect size: 0.3), and practice (2.04 ± 1.07 , 2.28 ± 0.60 , $p = 0.0001$, effect size: 0.1).

Conclusion: The storytelling method was effective in improving the oral health-related KAP of children aged 3–6 years.

Significance: This study attempts to inculcate good oral hygiene practices at a very early stage by targeting 3–6-year-old preschool children. Storytelling being humankind's oldest form of teaching and motivating change, can not only address the prevailing oral disease burden but also the oral health inequality by reaching out to every community.

Keywords: Experimental study, Game-based oral health education, Oral healthcare, Oral health knowledge, Pediatric oral health, Preschool children.

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INTRODUCTION

In developing countries like India, oral healthcare services have always been a challenge due to unaffordability, inaccessibility, and lack of utilization by the general community¹ and by the prevailing oral disease burden.² However, because of this prevailing oral health inequality, it is most difficult for the rural population to easily access these services.³

Health promotion, encompassing health education, has achieved a shift in the locus of initiatives for health from medical institutions and health professionals to individuals and communities.⁴ In this direction, edutainment plays a vital role in catering to the diverse population's needs in healthcare.^{5–8}

India has always had a rich culture of storytelling.⁹ From national epics to local, village stories have been passed down orally from generation to generation. The interesting stories range from the remarkable "Panchatantra" to "Hitopadesha", from Vikram Betal to "Akbar-Birbal". Limited literature has been identified regarding the effectiveness of storytelling among elderly and youth in improving health.^{10,11} But there is no study where the effectiveness of storytelling is used to promote oral health among children.

As there are already existing storytelling sessions in most of the preschools in India, incorporation of the oral health messages in stories can bring about a change in the oral health-related knowledge, attitude, and behavior of the children.¹²

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The objective of the current study was to investigate the effects of storytelling on the knowledge attitude and behavior of kindergarten children as it is critically important to find economical scientific methods in accordance with the affordability of health education responsible organizations which are effective in educating children and applicable at the kindergarten level, too.

MATERIALS AND METHODS

Design and Sample

A non-randomized pre–post study was conducted on 220, 3–6-year-old preschool children, in urban Bengaluru. Ethical clearance was obtained.

Conceptualization of the Story

An age-appropriate story with oral health messages have been conceptualized after a thorough review of the literature and numerous focus group discussion with various stakeholders; teachers, parents, dentists, and storyteller. Based on the oral health content provided by WHO Health-promoting School, and the feedback of the stakeholders, the story was conceptualized considering the feasibility of using Fogg’s behavior model. The story contained the following oral health messages; toothbrushing frequency, toothbrushing technique, amount of toothpaste, type of toothbrush, flossing, mouth washing, healthy and junk food, visit to the dentist. Oral health rhymes was also included in the story for reinforcement.

Questionnaire

An 11-item, closed-ended, picture-based questionnaire was designed to assess KAP for the pretest evaluation. For the posttest evaluation 4 practice questions among the 11 questions were removed and a 7-item questionnaire was administered. The change in practice component was evaluated using 1 week audit sheet administered for the parents.

Intervention

Permission from school authorities, written informed consent from parents, and verbal assent from the children were obtained under the agreement of confidentiality and anonymity. The program was named Danta Katha Loka, and the story was titled Piggy and Dr Peacock. The pretest questionnaire was distributed. Each question was read out loud for the children to understand. On the return, a storytelling session was conducted for the same group the story was delivered using hand puppets for 15–20 minutes in a group of 20–25 children. Following the same protocol, the posttest questionnaire was administered.

An audit sheet and A goodie bag were distributed to each child at the end of the intervention.

Analysis

Descriptive and inferential statistics were used to analyze the data in the study. Demographic details and feedback were expressed in terms of number and percentage. Change in KAP was assessed using the non-parametric “Wilcoxon Sign Rank test” as the data was non-normal. $p < 0.05$ was considered significant. Cohen’s d^{13} was used to calculate the effect size.

RESULTS

Among 220 participants, 103 (46.8%) were males and 117 (53.2%) were females. The age of the participants ranges from 3 to 6 years. The majority of the participants were 4-year-old, 28 (56%), followed by 5 years 16 (32%) (Table 1).

Effectiveness of Storytelling (Table 2 and Figs 1 and 2)

Significant improvement was observed in mean KAP score (pre 7.52 ± 1.95 , post 1.55 , $p = 0.0001$) with effect size 0.2. There was

Table 1: Demographic detail of the participants

S. no.	Variables	N (%)				
1	General characteristics					
1a	Age	3 years	2 (4)			
		4 years	28 (56)			
		5 years	16 (32)			
		6 years	4 (8)			
1b	Gender	Male	35 (70)			
		Female	15 (30)			
2	Demographic details					
2a	Parents’ education	Father’s education	Illiterate	0 (0)		
			Primary school	0 (0)		
		Middle school	0 (0)			
		High school	15 (7)			
		College	61 (28)			
		Degree	144 (66)			
		Mother’s education	Illiterate	0 (0)		
			Primary school	0 (0)		
			Middle school	0 (0)		
			High school	22 (10)		
			College	67 (30.5)		
			Degree	131 (60)		
		2b	Parents occupation	Father’s occupation	Unemployed	0 (0)
					Unskilled worker	2 (1)
Semi-skilled worker	2 (1)					
Skilled worker	14 (6)					
Clerk, shop owner	33 (15)					
Semiprofessional	56 (26)					
Professional	116 (51)					
Mother’s occupation	Unemployed			63 (29)		
	Unskilled worker			3 (1)		
	Semi-skilled worker			4 (2)		
	Skilled worker			22 (10)		
	Clerk, shop owner			25 (11)		
	Semiprofessional			29 (13)		
	Professional			74 (34)		

a significant increase in the knowledge and attitude and practice score, knowledge (pre 2.97 ± 1.02 , post 3.63 ± 0.78 , $p = 0.0001$, effect size: 0.3), attitude (2.27 ± 0.81 , 2.77 ± 0.60 , $p = 0.000$, effect size: 0.3), and practice (2.04 ± 1.07 , 2.28 ± 0.60 , $p = 0.0001$, effect size: 0.1).

DISCUSSION

The present study explores the effectiveness of storytelling (product) in increasing oral health knowledge, attitude, and behavior of the children, we considered the term “beta test” to be appropriate.

This study attempts to inculcate good oral hygiene practices at a very early stage by targeting 3–6-year-old preschool children. Children at this age are reaches a developmental milestone where children grow physically, socially, emotionally, and intellectually.^{14,15}

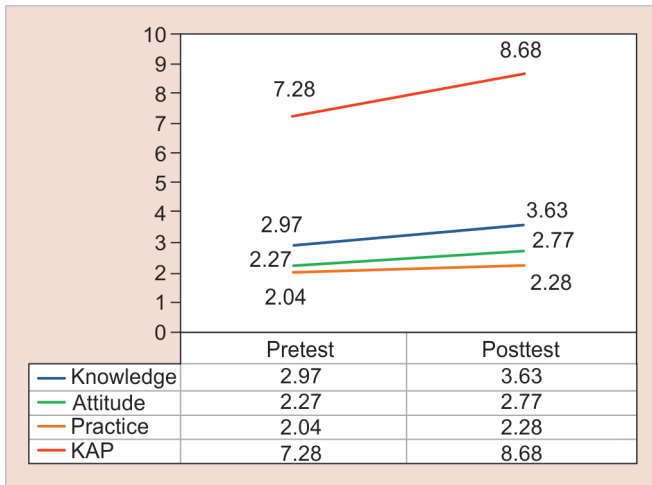


Fig. 1: Change in mean score from pretest to posttest

Table 2: Increase in KAP after the intervention

S. no.	Parameters		Mean ± Std	Z	p value	Effect size
1	Knowledge	Pretest	2.97 ± 1.02	-7.80	0.00*	0.3
		Posttest	3.63 ± 0.78			
2	Attitude	Pretest	2.27 ± 0.81	-6.57	0.00*	0.3
		Posttest	2.77 ± 0.60			
3	Practice	Pretest	2.04 ± 1.07	-2.62	0.009*	0.1
		Posttest	2.28 ± 0.60			
4	KAP	Pretest	7.52 ± 1.95	-5.43	0.00*	0.2
		Posttest	8.60 ± 1.55			

*Significant

Our study considered to evaluate the effectiveness of storytelling in improving the oral health related KAP through a picture-based questionnaire and audit sheet. Hence, we chose to measure these study variables by using oral health-related KAP questionnaire. Isolated studies are present in the dental literature measuring the oral health-related KAP,¹⁶⁻¹⁸ there was lack of availability of KAP questionnaire for 3-6-year-old children, and hence the investigator developed a new picture-based KAP questionnaire considering the comprehensiveness of the oral health information appropriate for that age group. The outcome of this development process was an 11-item, close-ended self-administrated KAP questionnaire. To prevent the observer bias as an offshoot of fatigue during the questionnaire filling process, we chose only 15-20 preschool children at a time for storytelling session. The present study shows a significant increase in the KAP score (pre 7.52 ± 1.95, post 8.60 ± 1.55, $p = 0.0001$) with effect size 0.2. The findings are in consistence with, similar studies done in a school setting in the other countries have reported a significant improvement in oral health-related knowledge scores¹⁹ and nutrition knowledge scores²⁰ in school children. In a study conducted by Amaro et al.,²⁰ after a 24-week post-interventional follow-up period, the mean nutrition knowledge in the intervention group (played the Kaledo nutrition health board game) were when compared with for the control group. In a study done by Sinor,²¹ there was an over-all increase in oral health-related KAP in the intervention group (watched oral health-related cartoon animations) when compared with

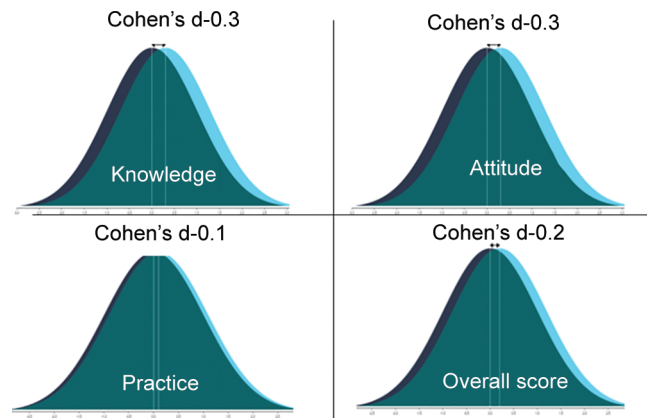


Fig. 2: Effect size interpretation of KAP scores

the control group (received conventional oral health instructions) with an effect size of 0.2. It also focuses upon the effectiveness of edutainment-based approach when compared with traditional method of oral health education.^{19,20}

The concept of this edutainment program incorporates the universally popular and culturally expected storytelling component which has been sustained over centuries in India and is culturally stable not only in children but also in adults. The stories like Hitopdesha, Panchatantra, Akbar Birbal, and Vikram Betal are still popular and imparts moral values among Indian population. The present study findings and overwhelming acceptability of the story by the children provides compelling evidence that this concept cuts across society and may reach millions of children irrespective of urban and rural. The attempt to change the oral health practice of an individual usually takes longer time to gain momentum before reaching a tipping edge, there after which very minimal efforts are required to get a change. The storytelling method is believed to work on this tipping edge concept,²² wherein the edutainment component gives the tipping edge. Considering the positive effects of education, it could be said that actively educating children by storytelling is effective in increasing their awareness about dental and oral hygiene.

CONCLUSION

The storytelling method was effective in improving the oral health-related knowledge, attitude, and practice children aged 3-6 years.

CLINICAL SIGNIFICANCE

- Storytelling is a cost-effective edutainment tool, can be integrated into any community irrespective of the urban and rural.
- Requires minimum infrastructure hence can be easily administered.
- Storytelling in India has its own cultural value hence can aid in widespread acceptance.

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