

A Study to Assess the Effectiveness of Child-to-Child Approach on Knowledge Regarding Dental Hygiene Among School Children at Selected School, Bangalore

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Abstract

Introduction: Every child has a fundamental right to comprehensive health, and it is our duty to uphold this principle. Dental health is a vital component of overall well-being, and the causes and risk factors for oral diseases often align with those of significant general health issues. In developing countries, many children experience tooth decay, which is frequently deprioritized for treatment due to limited access to oral health services. Poor dental health in childhood can carry into adulthood, affecting economic productivity and quality of life. The child-to-child approach aims to improve health outcomes and reduce infant mortality by promoting positive health behaviors among children. **Methods:** An evaluative approach was utilized in this study to assess the effectiveness of the child-to-child method in improving dental hygiene knowledge among school children. A quasi-experimental design was implemented, focusing on students from 1st to 7th grade at a selected school in Bangalore, with participants chosen using a simple random sampling technique. **Results:** The analysis indicated that the overall pretest mean score was 20.18, corresponding to a percentage mean of 50.45% and a standard deviation of 4.32. In contrast, the posttest mean score increased to 36.55, reflecting a percentage mean of 91.37% and a standard deviation of 1.12. This indicates an improvement in the school children's knowledge about dental hygiene. The increase in knowledge was shown by a mean difference of 16.37, a percentage mean increase of 40.92%, and a standard deviation of 2.49. Since the posttest scores exceeded the pretest scores, the child-to-child approach proved to be effective. **Recommendations:** Based on the study results the investigator suggested that a similar study can be undertaken with a larger number samples to generalize the findings.

Keywords: Dental hygiene, dental caries, child to child approach, school age, quasi experimental study

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Received Date: November 30, 2024

Accepted Date: January 13, 2025

Published Date: January 25, 2025

Citation: Precilla Jebarani J., Nagamani T., Selvarani S. A Study to Assess the Effectiveness of Child to Child Approach on Knowledge Regarding Dental Hygiene Among School Children at Selected School, Bangalore. Journal of Nursing Science & Practice. 2025; 15(1): 9–16p.

INTRODUCTION

The goal of WHO health for all by the year “2025 AD” is the slogan which gives importance to health care by the people and for the people. The aim was to increase awareness of different oral diseases and inform individuals about their prevention. School age is a critical developmental stage during which children learn to integrate into their peer groups. Instilling proper dental hygiene habits during this time can significantly contribute to maintaining a child's oral health throughout their life.

Dental health is defined as “the science and practice of preventing and managing dental diseases and promoting oral health through community

efforts.” Dental diseases are notable for their widespread prevalence and their persistence if left untreated, necessitating specialized expertise and time-consuming professional care [1–3].

Dental health is a crucial aspect of overall health, and it is evident that the risk factors for oral diseases often overlap with those for major general health conditions. Oral health plays a crucial role in the overall well-being, education, and development of children, families, and communities. Many children and their parents lack sufficient knowledge about the causes and prevention of common oral diseases. In India, a very small percentage of mothers receives adequate guidance on children's oral care from dentists or healthcare professionals. Additionally, the rate of children brushing their teeth is alarmingly low in many countries, including India, leading to increased premature tooth loss, malocclusion, and other related issues [4].

The child-to-child approach was developed in 1979 for the International Year of the Child by a group of health and education specialists. Its aim was to enhance health and decrease infant mortality by promoting positive health practices among children. Utilizing activity-based learning methods, this approach is implemented in programs across more than 90 countries. These programs vary from organized school initiatives to children's involvement in community health efforts in urban slums. Children tend to grasp concepts more effectively when activities involve visuals, role-playing, puppetry, poetry, drawing, mime, games, radio, dance, or multimedia such as films and videos. These engaging methods enhance their understanding [5].

NEED FOR THE STUDY

Today's children are tomorrow's leaders. They form 38 to 40% of our general population. Oral health issues, particularly dental caries, are significant challenges for future generations, especially in developing countries like India. These problems are exacerbated by factors such as illiteracy, poverty, and rapid population growth, which hinder the delivery of effective healthcare services. Consequently, prevention becomes a crucial strategy for enhancing oral health and overall well-being [6].

Maintaining dental health involves keeping the lips, teeth, gums, tongue, and palate in a healthy condition. Good dental hygiene focuses on cleaning and moisturizing the mouth to preserve oral health. Regular brushing helps eliminate food particles, plaque, and bacteria from the teeth. In North and West Belfast, 55 schools were paired according to their socio-economic status. From this group, 10 schools were randomly selected and assigned to either intervention or control groups, involving a total of 482 children. Older children in the intervention group were taught the “Snacks Facts” program and acted as “teachers” in the child-to-child intervention. Both baseline and final assessments were conducted to evaluate the children's dental health knowledge, snacking knowledge, and behaviors through questionnaires and waste analysis. The older children in the intervention group showed more significant improvements in their average knowledge scores compared to those in the control group. Additionally, they had greater reductions in mean cariogenic snacking scores than their counterparts in the control group [7].

A study was conducted for school children in Amritsar city. It was observed that 49.9% female children were suffering from dental caries. Most of the children taking sweets were having dental caries. Hence awareness must be brought among the children regarding their dietary habits and bad effects of sticky diet must be brought in their notice [8].

A descriptive study was designed as a national-level investigation to evaluate the prevalence of malocclusion and the oral hygiene levels among school children aged 12 to 14 years in two socio-economically distinct districts of Tanzania. The study involved 1,601 children (average age 13 years, 60.5% girls) from 16 primary schools in the Kinondoni and Temeke districts, where clinical examinations and interviews were conducted in their school environments. The findings revealed that 63.8% of the children (62.6% in Kinondoni and 66.0% in Temeke) had at least one type of dental anomaly. The most commonly observed issues were midline shift (22.5%), spacing of at least 2 mm (21.9%), and open bite (16.1%) [9].

A study was conducted for oral health status of school children of Wardha to find out the geographical differences in the oral health status and related it with teeth cleaning habits and the nutritional status. 778 children from two urban and two rural schools were selected; majority (60.8%) of the children were habituated to clean their teeth with a locally available herb. The oral health status of the children was found to be good in the urban status compared to the rural schools [10].

A study presented findings indicating that over 50% of children aged 12 to 15 years in rural Kerala suffer from some form of dental disease. Both boys and girls are equally impacted, with dental caries being the most common problem [11].

The investigator has identified that most of the school children are having dental caries. The aim of the investigator includes promotion of dental health by improving the dental hygiene practices. The investigator also felt that a different approach like child to child approach can make the children to learn actively the dental hygiene practices themselves. Hence, the investigator planned to conduct the present study to improve the knowledge about dental care among school children.

OBJECTIVES OF THE STUDY

- To evaluate the level of knowledge schoolchildren have about dental hygiene.
- To assess how effective the child-to-child approach is in enhancing dental hygiene knowledge among school children.
- To determine the association between knowledge regarding dental hygiene with selected demographic variables such as age, education, religion, type of family, location of family, occupation of parents, food pattern and sources of information on dental hygiene.

HYPOTHESES OF THE STUDY

- *H1*: The average posttest knowledge scores of school children will be significantly greater than their average pretest knowledge scores.
- *H2*: There will be a significant relationship between knowledge levels and selected demographic variables, including age, education, religion, family type, parental occupation, dietary habits, and sources of information on dental hygiene.

ASSUMPTION

The study is based on the following assumptions:

- School children may possess limited knowledge about dental hygiene.
- Children's dental hygiene practices may vary according to their level of knowledge.

DELIMITATION

The study is restricted to:

- School children aged 6 to 12 years.
- A sample size of 40 participants.
- A data collection period of 6 weeks.

METHODOLOGY

An evaluative method was employed in this study to assess the effectiveness of the child-to-child approach in enhancing dental hygiene knowledge among school children. A quasi-experimental design was selected for the research.

In this study, the independent variable is the child-to-child approach related to dental hygiene, while the dependent variable is the school children's knowledge of dental hygiene. The research was conducted at a selected school in Bangalore, targeting students from 1st to 7th grade. A simple random sampling method was employed.

Inclusion Criteria

The study includes school children who are:

1. Available during the period of data collection.
2. Willing to participate in the study.
3. Able to read and write Kannada/English.
4. Between the age of 6 and 12 years.

DESCRIPTION OF THE TOOL

The tool used for the study comprised of a structured interview schedule and child to child approach on dental hygiene consisting of two parts, namely, part I and Part II.

- *Part I:* It deals with demographic variables which include age, education, religion, type of family location of family, occupation of parents, food pattern, and sources of information.
- *Part II:* This section includes 30 multiple-choice questions on dental hygiene, divided into three subsections.

A health education plan was also prepared by the investigator which covers major areas such as definition of dental hygiene, define brushing, dental problems of poor dental hygiene, purpose, scientific principles, and solutions used for mouth wash, denitrifies used for mouth wash, causes of tooth loss and periodontal diseases, diet to prevent dental caries, name of tooth paste. Content validity was established with the help of five experts. To ensure the tool's reliability, the split-half method was employed, resulting in a reliability coefficient of $r=0.8$ for data collection. The proposed study was conducted after obtaining permission from the ethical committee, Chinai College of Nursing.

RESULTS

The demographic variables which include age, education, religion, type of family location of family, occupation of parents, food pattern, sources of information and pretest and posttest mean knowledge scores of respondents on dental hygiene is observed and discussed in Tables 1–6.

DISCUSSION

The results of the study are discussed as per the following objectives:

- *Objective 1: To assess the level of knowledge of school children regarding dental hygiene:* The results indicated that among the 40 samples, 97.5% displayed inadequate knowledge about dental hygiene in the pretest. Approximately 2.5% had moderate knowledge, while none had adequate knowledge.
- *Objective 2: To assess the effectiveness of child-to-child approach on knowledge regarding dental hygiene:* Analysis result showed that the overall pretest mean is 20.18 and mean % of 50.45% with SD of 4.32 and posttest mean is 36.55 and mean % 91.37% with SD of 1.12. An increase in knowledge was noted, with a mean of 16.37, a mean percentage of 40.92%, and a standard deviation of 2.49. Since the posttest score exceeded the pretest score, the child-to-child approach proved to be effective.
- *Objective 3: To determine the association between pretest knowledge regarding dental hygiene with selected demographic variables:* The analysis of the association between the pretest knowledge level and selected demographic variables using the chi-square test showed no significant relationship with variables such as age, education, religion, type of family, dietary patterns, and sources of information, as the obtained values were lower than the critical value at the 0.05 significance level. As a result, the null hypothesis is accepted, and research hypothesis H2 is rejected. However, a significant association was identified between pretest knowledge scores and variables such as parental occupation and family location, with the obtained values surpassing the critical value at the 0.05 significance level. Therefore, research hypothesis H2 is accepted, and the null hypothesis is rejected.

Table 1. Frequency and percentage distribution of demographic variables.

S.N.	Demographic variables	Frequency	%
1.	<i>Age</i>		
	a) 6–12 years	38	95
	b) 12–16 years	2	5
	c) Above 16 years	0	0
2.	<i>Education</i>		
	a) Primary education	36	90
	b) Middle education	4	10
3.	<i>Religion</i>		
	a) Hindu	20	50
	b) Christian	15	37.5
	c) Muslim	5	12.5
4.	<i>Type of family</i>		
	a) Nuclear family	18	45
	b) Joint family	22	55
5.	<i>Occupation of parents</i>		
	a) Coolie	23	57.5
	b) Agriculture	9	22.5
	c) Business	8	20
	d) Others	0	0
6.	<i>Food pattern</i>		
	a) Vegetarian	21	52.5
	b) Nonvegetarian	19	47.5
7.	<i>Location of family</i>		
	a) Urban	8	20
	b) Rural	32	80
8.	<i>Source of information</i>		
	a) Television	16	40
	b) Radio	4	10
	c) Newspaper	8	20
	d) No information	12	30

Table 2. Aspect wise pretest mean knowledge scores of respondents on dental hygiene (N=40).

Aspects of knowledge	Inadequate (<50%)		Moderate (50–75%)		Adequate (>75%)	
	No.	%	No.	%	No.	%
Dental hygiene	39	97.5	1	2.5	0	0
Causes of dental problems	38	95	2	5	0	0
Prevention of dental problems	36	90	4	10	0	0
Overall	38	95	2	5	0	0

Table 3. Aspect wise posttest knowledge scores of respondents on dental hygiene (N=40).

Aspects of knowledge	Inadequate (<50%)		Moderate (50–75%)		Adequate (>75%)	
	No.	%	No.	%	No.	%
Dental hygiene	2	5	32	80	6	15
Causes of dental problems	1	2.5	35	87.5	4	10
Prevention of dental problems	2	5	33	82.5	5	12.5
Overall	1	2.5	35	87.5	4	10

Table 4. Overall pretest and posttest mean knowledge score on dental hygiene (N=40).

Aspects of knowledge	Max. score	Respondents knowledge		
		Mean	SD	Mean %
Pretest	40	20.18	4.32	50.45
Posttest	40	36.55	1.12	91.37
Enhancement	40	16.37	2.49	40.92

* Significant at 5% level.

Table 5. Overall knowledge aspects mean knowledge score on dental hygiene (N=40).

Domain	Respondents knowledge (%)						Paired 't' test
	Pretest		Posttest		Enhancement		
	Mean	SD	Mean	SD	Mean	SD	
Knowledge aspects	20.18	4.32	36.55	1.12	16.37	2.49	27.2***S

N.S= Not Significant; S= Significant; *P>0.05 level, **P>0.01 level, ***P>0.001 level

Table 6. The analysis of association of selected demographic variables with pretest level of knowledge.

S. N.	Demographic variables	No.	%	Inadequate (<50%)		Moderate (50–75%)		Adequate (>75%)		Chi square
				No	%	No	%	No	%	
1.	Age									
	a) 6–12 years	38	95	36	60.00	2	3.33	0	0.00	1.78 df 1 N.S
	b) 12–16 years	2	5	2	3.33	0	0.00	0	0.00	
	c) Above 16 years	0	0	0	0.00	0	0.00	0	0.00	
2.	Education									
	a) Primary education	36	90	34	56.67	2	3.33	0	0.00	1.23 df 1
	b) Secondary education	4	10	4	6.67	0	0.00	0	0.00	
3.	Religion									
	a) Hindu	20	50	19	31.67	1	1.67	0	0.00	1.28 df 2 N.S
	b) Christian	15	37.5	14	23.33	1		0	0.00	
	c) Muslim	5	12.5	5	8.33	0	0.00	0	0.00	
4.	Type of family									
	a) Nuclear family	18	45	17	28.33	1		0	0.00	1.42 N.S
	b) Joint Family	22	55	21	35.00	1	1.67	0	0.00	
5.	Occupation of parents									
	a) Coolie	23	57.5	23	38.33	0	0.00	0	0.00	5.99 df 2 S*
	b) Agriculture	9	22.5	8		1		0	0.00	
	c) Business	8	20	7	11.67	1	1.67	0	0.00	
	d) Others	0	0	0	0.00	0	0.00	0	0.00	
6.	Food Pattern									
	a) Vegetarian	21	52.5	20	33.33	1	1.67	0	0.00	1.05 df 1 N.S
	b) Nonvegetarian	19	47.5	18	30.00	1	1.67	0	0.00	
7.	Location of family									
	a) Urban	8	20	6	10.00	2	3.33	0	0.00	8.41 df 1 S**
	b) Rural	32	80	32	53.33	0	0.00	0	0.00	
8.	Previous source of information regarding dental hygiene from									
	a) Television	16	40	15	25.00	1	1.67	0	0.00	4.33 df 3 N.S
	b) Radio	4	10	4	6.67	0	0.00	0	0.00	
	c) Newspaper	8	20	7	11.67	1	1.67	0	0.00	
	d) No information	12	30	12	20.00	0	0.00	0	0	

NS= Not Significant; S= Significant *P>0.05 level; **P>0.01 level; ***P> 0.001 level.

CONCLUSION

- Majority of the school children belongs to the age group of 6–12 (95%) followed by 12–16 years of age (5.0%).
- Majority of the school children (90.0%) had primary school, 10.0% had middle school education.
- The type of the family, majority (55%) were joint families, 45% were nuclear families.
- Religion wise majority (50%) of the school children belongs to Hindu families, 37.5% were Christian families and 12.5% were Muslim families.
- The majority of parents' occupations included 57.5% working as laborers, 22.5% in agriculture, and 20% in business.
- 52.5% of school children were vegetarian, 47.5% were non-vegetarian.
- The location of family, majority (80.0%) were living in rural area, 20.0% were living in urban area.
- Majority (28 (70%)) had received information on dental hygiene and 12 (30%) did not receive information on dental hygiene.
- The source of information of school children from television was 16 (40%), radio was 4 (10%) and newspaper was 8 (20%).
- The overall mean pretest knowledge score is 20.18%, with a standard deviation of 4.32%.
- The aspect wise mean pretest knowledge score was found in the area of dental hygiene (2.5%) followed by for causes of dental problems (5.0%) and prevention of dental problems (10.0%). In the posttest, the samples achieved the highest mean percentage scores of 80% in the area of dental hygiene, 87.5% in the causes of dental problems, and 82.5% in the prevention of dental issues.
- The paired 't' test results revealed a statistically significant difference between the pretest and posttest knowledge scores related to dental hygiene across all investigated aspects ($P < 0.05$).
- A statistically significant association was observed between occupation of parents and location of family and knowledge level of respondent in pretest on dental hygiene, the X^2 of 5.99 with 2df, 8.41 with 1df respectively at 0.05 level of significance.
- Whereas age, education, religion, type of family, food pattern and source of information do not show any association with the knowledge of school children of dental hygiene.

Implications of the Study

Nursing Practice

Nurses should be involved in planning the dental hygiene for school children. Nurses should incorporate the concept of different levels of dental hygiene in their practice. They can play a key role in identifying the causes and prevention of dental problems and can motivate children to improve health of children which will prevent dental problems.

Nursing Education

Nurse education can teach the adults to acquire knowledge on dental hygiene. They can also teach the school children about the adverse effects which affect the health of the school children due to dental problems. Nurse educator can teach to adopt appropriate preventive measures against dental problems.

Nursing Administration

Nurse administrators can plan and conduct a short term educational program for school children as well as nurses to enhance their knowledge. For this, she should include all research findings in teaching program and conduct continuing education program periodically. Nurse administrators are in the key position to organize, implement and evaluate staff education programs which will in turn help to raise the standard of care.

Nursing Research

The study's findings indicate that most school children lacked knowledge about dental hygiene in the pretest. Based on these results, researchers are encouraged to conduct further studies on increasing awareness and improving dental hygiene knowledge among school children with larger sample sizes.

Such research could inspire new researchers to explore different variables on a larger scale. Additionally, nursing research can identify existing knowledge gaps in the profession, which will contribute to enhancing the quality and standards of nursing care through evidence-based practices.

Limitation

The present study has following limitations:

- The study has sampling constraints.
- Only 40 school children were selected as sample.
- Study was conducted only in school at Bangalore. Hence generalization is possible only to the selected settings.

Recommendations

- Similar study can be undertaken with a larger number samples to generalize the findings.
- A similar study can be undertaken with Quasi experimental design.

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