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Effectiveness of Dental Education Programme on Knowledge and Attitude Regarding Dental Caries and its Management among School Children from Selected Schools of Kolar

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Abstract

This study was conducted at schools to investigate the prevalence of dental caries and the effect of a dental education program on knowledge and attitude regarding dental caries and its management among School Children. An evaluative research approach with a one-group pre-test and post-test design was adopted to collect data The prevalence of dental caries was determined using the DMFT/DMFS index using the World Health Organization criteria 1997. After obtaining ethical clearance and permission from authorities children were subjects for dental screening; Mouth mirror, probe, and explorer were used for carrying out the dental examination in the classroom under natural light with the children seated on a stool, followed by administration of dental education program. The prevalence of dental caries among government and private school students is 31 (77.5%.) and the mean DMFT scores are 2.47 with a standard deviation of 2.184, and their mean DMFS scores are 5.38 with a standard deviation of 6.436. The majority 31(77.5%) school children were with dental caries and 9 (22.5%) with no tooth decay, the majority (100%) of school children had insufficient knowledge in the pre-test, 10% of school children had adequate knowledge on dental caries, and the majority (100%) of school children had an unfavorable attitude toward dental caries in the pre-test, (45%) had a moderately favorable attitude toward dental caries. The difference in knowledge and attitude about dental caries and its management between post-test and pre-test scores among school-aged children was statistically significant. The study's findings may be utilized to organize a school-based dental program for children and their parents to practice routine oral hygiene and get frequent dental checkups, allowing them to lead healthier lives.

Key words: *Dental caries, School children, Dental education program, DMFT/DMFS*

1. Introduction

1.1. Dental caries in children

Oral health has long been an integral element of overall health and has a significant impact on people's overall well-being. The formation of a healthy personality, perceptions, and overall enjoyable experience are all linked to the oral cavity. Dental caries and periodontal

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disease are the two most prevalent oral illnesses, and they commonly start in childhood. Periodontal disorders are the most common illness in the world, according to the World Health Organization. Despite technological breakthroughs, the illness remains a serious public health concern. People who have poor oral hygiene have more restricted activity days than those who do not. Oral disorders cause nearly 50 million school hours to be missed each year, affecting children's overall performance. In metropolitan India, there is a high frequency of oro-dental disorders, with caries prevalence ranging from 45 to 55 percent [1].

Infections, cosmetic issues, feeding difficulties, linguistic changes, the emergence of malocclusions and undesirable oral habits, as well as physical, emotional, and financial consequences, are all consequences of caries in children. Low socioeconomic status and low levels of education, poor eating and sanitary habits, medical history, and other variables unique to each individual might influence susceptibility to the disease's development [2].

Early childhood caries is a fast-growing condition that can damage teeth in a short period. It can spread to the proximal surfaces, causing irritation, suffering, and possibly affecting the tooth pulp, causing deciduous teeth to fall out prematurely. This damage or early tooth loss is not a serious issue for the child's parents, mainly because they are unaware of it. As a result, people seldom take the essential precautions to avoid it; as a result, it is not treated promptly, resulting in significant damage to the afflicted areas. It may potentially cause a variety of problems in the baby's mouth [3].

Early childhood caries is a substantial problem in both developed and developing nations, despite the drop in the prevalence of dental caries in children in Western countries [4]. The frequency of this form of caries varies widely based on characteristics such as race, culture, and ethnicity; socioeconomic position, lifestyle, food standards, and dental hygiene practices; and a variety of other factors that vary by location. According to a previous study, the incidence rate of early childhood caries ranges from 1 to 12 percent in most industrialized nations [5]. Prevalence has been claimed to be as high as 70% in less developed nations and among disadvantaged populations in industrialized ones, with low socioeconomic groups being more affected [6].

A high prevalence has been reported in some Asian countries, such as Palestine (76%) and the United Arab Emirates (74.1%) [7][8]. In other countries of the continent, an inconsistent prevalence of early childhood caries was found: in India (51.9%) and Israel (64.7%) [9]. In addition, the research by Ismail and Sohn [6] found a prevalence of 85.5% in Chinese children in rural areas [4].

In the United States, the prevalence was estimated to range between 3% to 6%, which is consistent with the prevalence in other Western countries, noting that the highest prevalence is found in the age group of 3 to 4 years and boys are significantly more affected than girls, aged between 8 months and 7 years [4][10].

Millions of children suffer from dental caries and periodontal disease, which causes pain, difficulties eating, swallowing, and speaking, as well as significant medical costs and missed time. It is vital to analyze oral health to design a treatment plan for a dental health program. To evaluate the magnitude of the Preventive obligation, it is critical to first understand the severity of the illness.

The District of Kolar is a geographical region situated in the state of Karnataka on the Andra Pradesh - Tamilnadu frontier. Many of the people who remain here have a lower socio-economic position. Karnataka State has several zones with high drinking water fluoride levels. There are also areas of skeletal and dental fluorosis in the District of Kolar. No current research was done in this area to show the prevalence of dental caries and thus the prevalence of dental caries in the Kolar district school children was determined by a study.

Keeping in mind that the investigator is interested in assessing children who are suffering from dental caries, for this purpose underwent DMFT/DMFS indices in assessing training so that children can be recognized at an early stage and preventive measures can be implemented, thus reducing the burden of diseases with Objectives 1] To determine the prevalence of dental caries among school children. 2] To examine schoolchildren exists knowledge and attitudes on dental caries and its management. 3] To assess the efficacy of dental education programs. 4] To compare pre- and post-test knowledge and attitude ratings among schoolchildren about dental caries and their management. 5] To determine the association between the pretest knowledge and attitudes scores of school-going children with selected demographic variables.

1.2. Research hypothesis

The hypothesis of this study is as follows

H01: The mean post-test knowledge scores will not be significantly higher than pre-test scores.

H02: The mean post-test attitude scores will not be significantly higher than pre-test scores.

2. Contents

2.1. Study design

The current study used an evaluative research technique to analyze the impact of a dental education program on schoolchildren's knowledge and attitudes about dental caries and its management in the Kolar government and private schools. The current study's aims were met using a one-group pre-test post-test (pre-experimental) design. The Independent variable is a dental education program and the Dependent variable is the knowledge and attitude of school children regarding dental caries and their management.

2.2. Participants

The target population of the present study comprises School going children studying at government and private schools of Kolar. By adopting Non - the probability convenient sampling technique 40 children from government and private school was used to collect data.

2.2.1. Sample selection criteria

Inclusion criteria:

Schoolgoing children at government and private schools in Kolar who are;

1. Studying at selected government and private schools in Kolar.
2. Between the age group of (6-10 years)
3. Willing to participate in the study
4. Available throughout the study.
5. Able to understand read and write English or Kannada.

Exclusion criteria:

School going children at government and private schools in Kolar who are;
1] On leave on the day of data collection
2] Treatment with dental problems.
3] Suffering from cleft lip and cleft palate

2.3. Selection and development of the tool

To find the prevalence of dental caries. The DMFT/DMFS Index was utilized, as well as a structured interview schedule to measure school-aged children's knowledge of dental caries and its management, and an Opinniare - Likert scale to assess school-aged children's attitude toward dental caries and its management.

2.4 Reliability

Structured knowledge questionnaires' dependability Cronbach's Alpha value of 0.63 (acceptable) and Cronbach's Alpha value of 0.93 for the attitude tool are both outstanding. This means that the tool was trustworthy.

2.5 Method of data collection

Data were collected from 40 participants after receiving official authorization from the relevant authority. On the first day, each child was examined for dental caries using the DMFT/DMFS index, using the World Health Organization criteria 1997. After obtaining ethical clearance and permission from authorities children were subjects for dental screening; Mouth mirror, probe, and explorer were used for carrying out the dental examination in the classroom under natural light with the children seated on a stool, followed by a structured interview schedule to assess knowledge and attitudes about dental caries and its management. On the same day, the research scholar delivered an integrated awareness session to the participants. Knowledge and attitude were examined after the seventh day of post-intervention using the same measure to see if the integrated awareness program had had any effect. The sample data was uploaded to an excel sheet for statistical analysis.

3. Result

The data were analyzed based on the study objectives, using both descriptive and inferential statistics. Findings are organized in the following headings

3.1. Distribution of School children based on demographic variables

Table 1:- Distribution of subjects based on demographic variables. (N=40)

Sr. no.	Demographic variables	Government School (N=20)		Private School (N=20)	
1	Age in years	Frequency	%	Frequency	%
	6 years	4	20.0	6	30.0
	7 years	4	20.0	2	10.0
	8 years	4	20.0	6	30.0
	9 years	3	15.0	2	10.0
	10 years	5	25.0	4	20.0
2	Gender				
	Male	9	45.0	12	60.0
	Female	11	55.0	8	40.0
3	Religion				
	Hindu	16	80.0	15	75.0
	Muslim	3	15.0	3	15.0
	Christian	1	5.0	2	10.0
4	Family type				
	Nuclear	19	95.0	20	100.0
	Joint	1	5.0	0	0.0
5	Members in family				
	Two	1	5.0	3	15.0
	Three	9	45.0	7	35.0
	Four	6	30.0	9	45.0
	More than four	4	20.0	1	5.0
6	Education of father				
	Primary	1	5.0	1	5.0
	Secondary	2	10.0	2	10.0
	Matriculation	6	30.0	7	35.0
	PUC	3	15.0	3	15.0
	Diploma	3	15.0	3	15.0
	Graduation	3	15.0	2	10.0
	Post Graduation	2	10.0	2	10.0
7	Education of mother				
	Primary	6	30.0	2	10.0
	Secondary	7	35.0	7	35.0
	Matriculation	1	5.0	1	5.0
	PUC	6	30.0	6	30.0
	Diploma	0	0.0	2	10.0
	Graduation	0	0.0	2	10.0
8	Father Occupation				
	Daily wager	2	10.0	2	10.0
	Self employee	5	25.0	5	25.0
	Private job	7	35.0	6	30.0
	Government Employer	1	5.0	3	15.0
	On contract basis	4	20.0	3	15.0
	Others	1	5.0	1	5.0
9	Mother Occupation				
	Daily wager	13	65.0	12	60.0
	Self employee	2	10.0	4	20.0
	Private job	4	20.0	4	20.0
	Government Employer	1	5.0	0	0.0
10	Ordinal position in the family				
	First	6	30.0	8	40.0

	Second	13	65.0	7	35.0
	Third	1	5.0	5	25.0
11	Area of residence				
	Rural	14	70.0	14	70.0
	Urban	6	30.0	6	30.0
12	Dietary pattern				
	Vegetarian	0	0.0	3	15.0
	Mixed	20	100.0	17	85.0
13	Source of information				
	Mass Media	5	25.0	5	25.0
	Peers/friends	1	5.0	2	10.0
	Family members	0	0.0	3	15.0
	Teachers	14	70.0	10	50.0

The frequency and percent-wise allocation of samples based on demographic characteristics reveal that the bulk of samples are at the age 25 percent of government school children belong to 10 years of age and 30 percent of private school children belong to 6 and 8 years of age, respectively. Sample distribution depending on gender majority Females made up 60% of students in private schools, while males made up 55% of students in public schools. Samples are distributed based on religion. In government schools, 80% of the students were Hindu, whereas, in private schools, 75% of the students were Hindu. In terms of family structure, 95 percent of children in government schools come from nuclear families, whereas 100 percent of pupils in private schools come from nuclear families. In terms of family members, 45 percent of government school students had three family members, compared to 45 percent of private school students who had four. The distribution of samples was dependent on the father's educational status. In government schools, 30% of dads finished matriculation, whereas, in private schools, 35% of fathers completed matriculation. According to the distribution of samples depending on the mother's educational status, 35 percent of government school children's moms finished PUC, whereas 35 percent of private school children's mothers completed secondary education. In terms of parent occupation, 35 percent of government school children's dads work in the private sector, whereas 30 percent of private school children's fathers work in the private sector. In terms of mothers' profession, 65 percent of government school children's mothers work as daily wagers, whereas 60 percent of private school children's mothers work as daily wagers. Sample distribution based on ordinal position majority of Children at government schools were born in the second ordinal position 65 percent of the time, whereas children in private schools were born in the first ordinal position 40 percent of the time. According to the distribution of samples based on the area of residence, 70% of government school students were from rural areas, whereas 70% of private school children were from rural areas solely. The majority of students in government schools ate a mixed diet, whereas 85 percent of children in private schools ate a mixed diet. According to the distribution of samples based on information sources, 70 percent of government school students received information from instructors, whereas 25% of private school children received information from the media.

3.2. Frequency of dental caries among school children

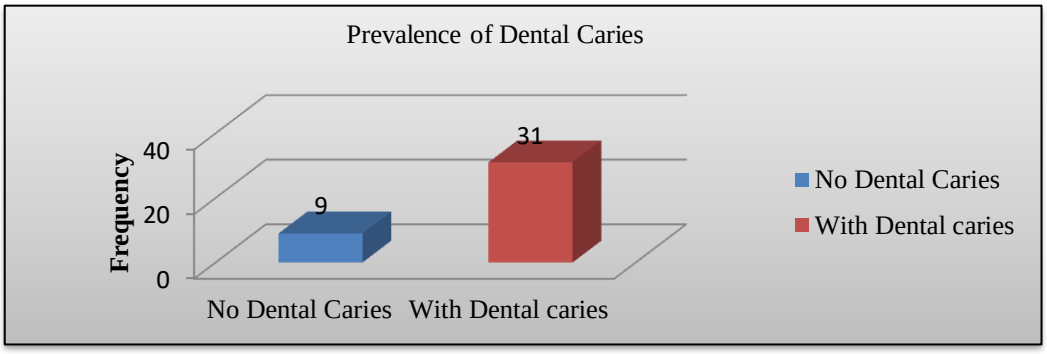

Figure 1. Frequency-wise distributions of samples based on the occurrence of dental caries

From the above graph, it is evident that out of 40 school children screened 9 (22.5%) were free from dental caries, and the remaining 31 (77.5%) had dental caries.

Table 2. Mean and standard deviation of DMFT and DMFS scores. N= 40

Descriptive Statistics	N	Minimum	Maximum	Mean	Std Deviation
DMFT scores	40	0	7	2.47	2.184
DMFS scores	40	0	25	5.38	6.436

Schoolchildren's mean DMFT scores are 2.47 with a standard deviation of 2.184, and their mean DMFS scores are 5.38 with a standard deviation of 6.436.

Table 3. Gender-wise mean% of DMFT and DMFS scores. N= 40

Gender		DMFT scores	DMFS scores	Mean % DMFT	Mean % DMFS
Boys	Mean	3.00	4.00	82.6	45.81
	N	24	24		
	Standard deviation	0.000	0.000		
Girls	Mean	4.56	15.81	125.6	181.1
	N	16	16		
	Std. Deviation	3.265	12.254		
Over All	Mean	3.63	8.73		
	N	40	40		
	Standard Deviation	2.168	9.597		

Boys' mean DMFT scores are 3.00 with a standard deviation of 0.000, and their mean DMFS scores are 4.00 with a standard deviation of 0.000, with a mean percent of DMFT score of 82.6 and a DMFS score of 45.81. Girls' mean DMFT scores are 4.56 with a standard deviation of 3.26, while males' mean DMFS scores are 15.81 with a standard deviation of 12.254. The average DMFT score is 125.6, while the average DMFS score is 181.1. Boys have a mean percent of DMFT scores of 3.63 2.168 (n=24) while girls have a mean percent of DMFT scores of 4.56 3.265 (n=16).

3.3. Knowledge and attitude level of school children on dental caries

Table 4. Frequency and % allocation of knowledge stage of school children. N=40

Sl. No	Knowledge level	Government School				Private School			
		Pre Test		Post Test		Pre Test		Post Test	
		f	p	f	p	f	p	f	p
1.	Inadequate knowledge	20	100.0	13	65.0	20	100.0	2	10.0
2.	Moderate knowledge	0	0.0	7	35.0	0	0.0	16	80.0
3.	Adequate knowledge	0	0.0	0	0.0	0	0.0	2	10.0
	Total	20	100.0	20	100.0	20	100.0	20	100.0

In the pre-test, the majority (100%) of schoolchildren had inadequate knowledge, whereas in the post-test, 65 percent of schoolchildren had inadequate knowledge and 35 percent had a moderate understanding. In private school pupils, the majority (100%) had poor knowledge in the pre-test, whereas the majority (80%) had moderate knowledge and 10% had deficient knowledge in the post-test.

Table 5. Frequency and % distribution attitude level of school children N=40

Sl. No	Attitude level	Government School				Private School			
		Pre Test		Post Test		Pre Test		Post Test	
		f	p	f	p	f	p	f	p
1.	Unfavorable attitude	20	100	15	75.0	20	100	11	55.0
2.	Moderately favorable attitude	0	0.0	5	25.0	0	0.0	9	45.0
3.	Favorable attitude	0	0.0	0	0.0	0	0.0	0	0.0
	Total	20	100	20	100	20	100	20	100

Samples are distributed based on attitude and school level. In the pre-test, the majority (100%) of students in government schools had an unfavorable attitude, whereas, in the post-test, 75% had an unfavorable attitude and 25% had a moderately positive opinion. In private school students, the majority (100%) had an unfavorable attitude in the pre-test, whereas 55 percent had an unfavorable attitude in the post-test, and 45 percent had a moderately positive opinion.

Table 6. Comparison of the post-test scores with pre-test scores of knowledge regarding dental caries and its management among school children. N=40

Paired t-test	Mean	N	Std. Deviation	Std. Error Mean	t value	df	P-Value
Pre Knowledge score	17.8	40	3.275	0.518	12.76	39	<0.001*
Post Knowledge score	27.6	40	4.407	0.697			

The mean knowledge score before the exam is 17.8, with a standard deviation of 3.27, while the mean knowledge score after the test is 27.6, with a standard deviation of 4.407. At 0.001 levels, the resulting t-value of 12.76 was significant. The difference between post-test and pre-test knowledge of dental decay and its management among school-aged children was statistically significant, indicating that the intervention enhanced their understanding.

Table 7. Comparison of the post-test scores with pre-test scores of attitude scores regarding dental caries and its management among school children. N=40

Paired t-test	Mean	N	Std. Deviation	Std. Error Mean	t value	df	P-Value
Pre Attitude score	40.8	40	5.737	0.907	10.49	39	<0.001**
Post Attitude score	48.6	40	5.498	0.869			

Pre-test attitude scores average 40.83 with a standard deviation of 5.737, while post-test attitude scores average 48.65 with a standard deviation of 5.498. At 0.001 levels, the resulting t-value of 10.492 was significant. The difference in attitude ratings before and after the intervention among school-aged children on tooth decay and its treatment was statistically significant, indicating that the intervention had changed their attitude.

3.4. To find out the association between before-test awareness and attitude scores with demographic variables of the samples

The Chi-square test was used to find out the association among selected socio-demographic variables with the pretest knowledge score of school children. The selected Population variables such as age, religion, family type, members of the Family, education status of the father, occupation of mother, ordinal Position, Place of residence, dietary type, and sources show a significant statistical association with their pre-test knowledge levels. The Population variables of school children such as age, family type religion, members of the family, education status of the father, occupation of mother, ordinal Position, place of residence, dietary type, and sources show a significant statistical association with their pre-test attitude levels.

4. Recommendation

Based on the results, the following recommendations were framed:

1. According to the findings, a short-term oral health education program can help improve oral hygiene and gingival health.
2. A large-scale cross-sectional investigation is required to reinforce the available data and generalize the findings.
3. Develop a variety of educational programs to increase schoolchildren's awareness of dental caries and how to treat it.
4. To address the rising problem of dental caries among schoolchildren, a school program should be promoted through integration into the school curriculum and oral health care preventative services.
5. Community-based oral health prevention initiatives emphasizing proper oral hygiene should be established.
6. School instructors and parents can raise awareness among youngsters by acting as role models for them.
7. Annual oral health education should be performed in schools, as well as the supply of oral hygiene aids at reduced prices, particularly in government schools.
8. A comparison research can be conducted to determine the best teaching approach using additional instruments.
9. According to the study, coordinating efforts between school staff, health professionals, and parents should be promoted to ensure the long-term advantages of such initiatives.

10. Further oral health promotion through a well-structured oral health education program and preventative school dental health program is recommended by the investigator to maintain this increase in dental caries awareness.

5. Limitations of the study

1. The study assessed knowledge and attitude by knowledge questionnaire and Likert scale only, but practice scores were not assessed on tooth brushing techniques.
2. The report was unable to analyze the additional factors that lead to decay, such as oral cleanliness, intake of sweets, and dental treatment.
3. As the study sample were school children research scholar had difficulty in gaining their attention during delivering the awareness program.

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