

Original Article

# A Study to Assess Dental Caries Among Rural Children and Effectiveness of Play Way Method of Teaching on Dental Hygiene in selected schools at Kuppam, Chittoor District, Andhrapradesh

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Received: 09 September 2022

Revised: 14 October 2022

Accepted: 26 October 2022

Published: 07 November 2022

**Abstract** - Oral hygiene is the practice of keeping one's mouth clean and free of disease and other problems (e.g., bad breath) by brushing the teeth (dental hygiene) and cleaning between and around the teeth regularly. Poor oral health will always affect the self-confidence of an individual. The most common types of dental diseases are tooth decay and gum diseases, including gingivitis and periodontitis. An evaluative approach, pre-experimental design with one group pre and post-test design was used. An oral examination was done, and the pre-test and post-test were conducted by administering a structured knowledge questionnaire. The play way method of teaching (Snake and ladder game) was used to impart knowledge on dental hygiene. The collected data was analyzed using descriptive and inferential statistics. Out of 225 primary school children, 60(27%) has dental caries. 31 (52%) children were affected with single teeth, 22 (37%) children were affected with 2 teeth, and 7 (12%) children were affected with 3 teeth. In the pre-test mean knowledge score was 2.9 with a SD of 2.9, the post-test mean score of 6.7 with a SD of 16.6, and the obtained p-value was significant at the level of  $p < 0.001$ , the obtained  $t$  – value was 3.66, showed a significant difference suggesting that the play way method of teaching was effective in imparting knowledge on dental hygiene. There was no significant relationship between the pre-test knowledge score with selected demographic variables. The study indicated that the play teaching method was an effective teaching strategy for providing information and improving dental hygiene knowledge among school children.

**Keywords** - Dental hygiene, Play way method of teaching.

## 1. Introduction

A child is the most precious gift with lots of potential within, which can be the best resource for the nation if raised and molded in a good manner. Healthy children can become healthy citizens constituting a healthy nation. Healthy children are also successful learners.<sup>1</sup>

Oral diseases, while largely preventable, pose a major health burden for many countries and affect people throughout their lifetime, causing pain, discomfort, disfigurement and even death.

According to WHO, The Global Burden of Disease Study 2017 estimated that oral diseases affect close to 3.5 billion people worldwide, with caries of permanent teeth being the most common condition. Globally, it is estimated that 2.3 billion people suffer from caries of permanent teeth and more than 530 million children suffer from caries of primary teeth.<sup>2</sup>

As per CDC, About 1 of 5 (20%) children aged 5 to 11 years have at least one untreated decayed tooth. 1 in 7 (13%) adolescents aged 12 to 19 years have at least one untreated decayed tooth. Children aged 5 to 19 years from low-income families are twice as likely (25%) to have cavities compared with children from higher-income households (11%).<sup>3</sup>

The Prevalence of early childhood caries differs according to the age group, and a prevalence of upto 85% has been reported for disadvantaged groups. Early childhood caries is the presence of one or more decayed, missed, or filled primary teeth in children aged 71 months or five years or younger<sup>4</sup>

Kamala Devi. C [2016] conducted a study to determine the effectiveness of snake and ladder games on knowledge of personal hygiene among 60 primary school children at Sri Ramakrishna Matriculation School, Coimbatore. Education about personal hygiene was given through a snake and ladder game for 5 days. The mean score before and after



education regarding personal hygiene was 13.68 and 33.31, and the standard deviation was 5.61 and 6.62, respectively, with a mean difference of 19.63. The calculated 't' value, 19.62, was greater than the table value at a 0.001 level of significance. Hence, it was concluded that the snake and ladder game effectively enhanced school children's knowledge regarding personal hygiene.<sup>5</sup>

Burman J, Dasgupta A et al. (2019) did a school-based, cross-sectional study conducted on oral hygiene among students of a secondary school in Haryana. Students studying 7<sup>th</sup>, 8<sup>th</sup>, and 9<sup>th</sup> of the school were approached, and the parents of 151 students gave their consent for the oral check-up. Among 151 students, 64.2% had poor oral health, 52.3% and 64.2% student had unsatisfactory awareness toward oral health and oral hygiene practice, respectively.<sup>6</sup>

Boustedt K, and Roswall J (2020), did a prospective cohort to assess the relationship between tooth-brushing habits and caries prevalence at the age of 5 years. 336 children were examined at 2, 3 and 5 years. The relative risk (RR) for caries was significantly ( $p < 0.05$ ) increased for "tooth brushing less than twice daily" at two years (RR 2.1, 95% CI 1.3–3.3,  $p < 0.01$ ) and 3 years (RR 3.6, 95% CI 2.0–6.7;  $p < 0.001$ ). Likewise, reporting "major/minor difficulties to perform tooth brushing" at 2 and 3 years was significantly related to caries development at the age of five years.<sup>7</sup>

Babitha Abiel(2020), A study was done to assess the Effectiveness of Play Method Health Education on Oral Hygiene Among Selected School Children in Amroha, India. A total of 177 subjects were selected. Most of the 80 children (45.19%) had dental caries in the age group of 9-10 years which comprises 41(23.2%) were female, and 39(22.0%) were male. Half of the children, 92 (52%), had attended the previous dental visit. Half of the children, 98 (55.36%), experienced a previous toothache. Most of the children, 323 (64.6%), were not affected by dental caries. There was a significant improvement in the knowledge score  $t = 28.77$  ( $p < 0.05$ ). The researcher found a significant effect on the play way method of teaching the Fones brushing technique to improve the dental hygiene practice among school children.<sup>8</sup>

Thilaga Mary S, V Chandrakala (2022) did a study to assess the Prevalence of dental caries and the Effectiveness of the Play Way Method (snake and ladder game) of Teaching Dental Hygiene among School Children at St. Arnold's High School, R.C.Puram, Hyderabad. The study revealed that the mean percentage between pre-test and post-test 1 was 41.46% and post-test 1 and post-test 2 was 5.7%. The overall mean improvement percentage between pre-test and post-test 2 was 47.19%. The calculated paired 't' value  $t = 14.734$ ,  $t = 19.370$  and  $t = 4.119$  between pre-test, post-test 1 and post-test 2 was statistically highly significant at  $p$ , 0.001 level, respectively. Therefore the study concluded that intervention of the snake ladder game as a play way method

of Teaching Dental Hygiene among children was found to be effective in improving the level of Knowledge of Dental Hygiene.<sup>9</sup>

## 2. Objectives and Hypothesis

1. To know the proportion of dental caries among schoolchildren
2. To assess the pre and post test knowledge scores regarding dental hygiene among school children.
3. To find out the association between the pre-test knowledge scores on dental hygiene among school children with their selected demographic variables

### 2.1. Hypothesis

#### 2.1.1. RH1

There will be a significant difference in pre-test and post test knowledge scores on dental hygiene among school children.

#### 2.1.2. RH2

There will be a significant association between pre-test knowledge scores on dental hygiene among school children with the demographic variables.

## 3. Materials and Methods

### 3.1. Study design, Setting, Sampling, and Tools

#### 3.1.1. Design

A quantitative experimental approach, pre-experimental design with one group pre and post-test design.

#### 3.1.2. Setting

Mandal Parishad primary school at beggilapalli, Kuppam, Chittoor district, Andhra Pradesh.

#### 3.1.3. Sample

Based on the non-probability purposive sampling technique, first, second and third standard students from Mandal Parishad primary school were selected. The sample size was estimated using power analysis, and the sample size was 225 schoolchildren. The population was selected by screening the children using the oral examination per the inclusion criteria. 225 school children were screened for dental problems, and 60 children with dental caries were selected for this study. Consent for participation was obtained in writing by their school teachers.

#### 3.1.4. Tool

It consists of three sections, including demographic variables of age in years, gender, standard, no of children in the family, previous dental visit, and previous experience of toothache, oral examination tool and pre and post-test knowledge questionnaire. The tool's reliability was established by the test and retest method, and the obtained  $r$  value was 0.796; hence the tool was considered reliable.

### 3.2. Permission

Formal permission was obtained from the headmaster of the Mandal Parishad primary school at Beglilipalli, Kuppam.

### 3.3. Ethical Consideration

Ethical clearance was obtained from the Institutional Human Ethics Committee (PESIMSR) and the headmaster of Mandal Parishad primary school

### 3.4. Data collection procedures

Step-1: Obtaining formal permission was obtained from the headmaster of the Mandal Parishad primary school in Beggilapalli Kuppam.

Step-2: The researcher introduced herself and explained the purpose and nature of the study, then obtained informed consent.

Step-3: Administration of demographic variables of school children

Step-4: Oral examination was done.

Step-5: Administration of pre-test on dental hygiene among school children, Each subject took 30-35 minutes to complete the interview schedule.

Step-6: Administration of the play way method ( snake ladder game ) teaching dental hygiene among school children.

Step-7: Administration of post test on dental hygiene among school children after seven days.

### 3.5. Statistical Analysis

The data were compared into an excel sheet analyzed using SPSS 23 version.

**Table 1. Description of data analysis**

| Sl. No | Type of Statistics     | Method                          | Objectives  |
|--------|------------------------|---------------------------------|---|
| 1      | Descriptive Statistics | Frequency and percentage        | To describe the demographic variables of school children.   |
|        |                        |                                 | Assess the knowledge level of dental hygiene  |
| 2      | Inferential Statistics | Independent and paired 't' test | Comparison of pre and post test mean sd, t and p values of knowledge scores on dental hygiene among school children |
|        |                        | Chi-square                      | Associate the pre-test levels of knowledge with the selected demographic variables                                  |

## 4. Results

### 4.1. Demographic Data

Frequency and percentage distribution of demographic variables of school children.

#### 4.1.1. Age (in years)

30(50%) children age was between 6- 8 years, 25(42%) children age was between 8.1- 10 years, and 5(8.3%) of them were aged between 10.1 to 12 years.

#### 4.1.2. Gender

About 31(51.7 %) of them were females and 29(48.3%) were males.

#### 4.1.3. Standard

12 (20%) students were studying 1<sup>st</sup> standard, 12 (36.7%) students were studying 2<sup>nd</sup> standard, 16( 26.7%) students were studying 3<sup>rd</sup> standard students and 4<sup>th</sup> standard students are 10(16.7%).

#### 4.1.4. No of children's in the family

About 31(51%) of the them have three children in their family, 23(38.3%) of them have two children in their family and 6(10%) have one child in their family,

#### 4.1.5. Area of Residence

The majority, 55(91.7%) and 5(8.3%), were residing in rural and urban areas, respectively.

#### 4.1.6. Family Size

Most of the children, 50(83.3%), belong to joint families, and 10(16.7%) belong to a nuclear family.

#### 4.1.7. Fathers' Occupation

7(11.7%) children's fathers were employed in the government sector, 23 (38%) fathers were working in private sector jobs, and 30(50%) of them were laborers.

### 4.2. Frequency and percentage distribution of school children based on the dental problems elicited by oral examination

#### 4.2.1. The total number of Teeth Present

About 38(17%) of the school children have less than 25 teeth, and 22 ( 98 % ) have more than 25 teeth.

#### 4.2.2. The number of Milk Teeth

The majority, 43 (19.1% ) of the school children having less than 5 milk teeth, whereas 17 (7.5%) of them have greater than 5 milk teeth.

#### 4.2.3. Number of Permanent Teeth

About 44(20%) of the school children having less than 20 permanent teeth and 10 (7.1%) of them were having greater than 20 permanent teeth.

4.2.4. Number of Tooth Decay

Almost 60(27%) of the school children are having tooth decay.

4.2.5. The number of Teeth Missing

Mostly, 58(26%) of the school children lost their milk teeth, and 2 (0.8 %) lost their permanent teeth due to dental carries.

4.2.6. The number of Teeth Filled

The majority, 37(16.4%) of them, had less than 25 teeth, whereas 23(10.2%) had greater than 25 teeth.

4.2.7. Toothache

Among 60 school children, 45 (20%) of them had a toothache, and 15 (6.6%) of them did not have a toothache.

4.2.8. Halitosis

Almost 32 (14.2%) of the school children had halitosis, and 28 (12.4%) of them were not having halitosis.

4.2.9. Discoloration due to Fluorosis

43(19.1%) school children were having discoloration of the teeth, and 17 (7.5%) of them were not having discoloration of the teeth.

4.2.10. Bleeding gums

Out of 60,27(12%) school children had bleeding gums, and 33 (15%) did not.

4.2.11. Brushing

Among 60 school children, 32 (14.2%) of them were

brushing their teeth twice a day (morning and night), and 28(12.4%) of them were brushing once in the morning.

4.2.12. The Habit of Drinking Bed Coffee

About 18(8%) of them were drinking bed coffee in the morning, and the remaining 42(19%) did not have the habit of drinking bed coffee in the morning.

4.2.13. Dental caries

Out of 225 primary school children, 60(27) have dental caries.

4.2.14. The number of affected Teeth

31 (52%) of them was affected with single teeth, 22 (37%) of them were affected with 2 teeth, and 7 (12) of them were affected with 3 teeth.

4.2.15. The Severity of Tooth Decay

Out of 60, 58(99%) school children were partially affected with dental caries, and 2 (1%) were completely affected with tooth decay.

The comparison of frequency and percentage of pre-test and post test among school children revealed, on the pre-test, 31(52%), 27(45%) and 2(3.3%) of them were had poor, average and good knowledge of dental problems, respectively. None of them had excellent knowledge Whereas in post test, 1(1%),3(5%) of them had poor and average levels of knowledge and 44(74%) of them were had good knowledge, and 12(20%) of them had excellent knowledge, respectively.

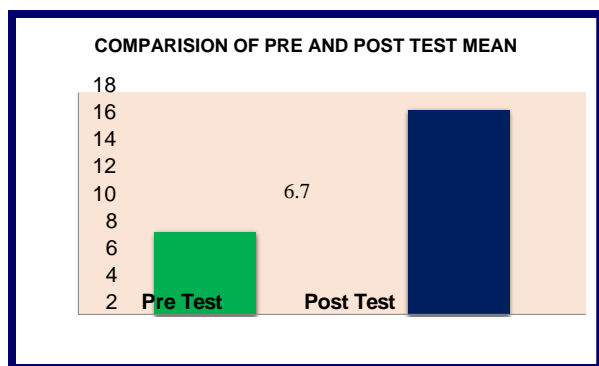
Table 2. Frequency and percentage distribution of pre-test and post test knowledge scores on dental hygiene among school children with dental caries N=60

|                  | Poor level of knowledge |    | Average level of knowledge |    | Good level of knowledge |    | Excellent level of knowledge |    |
|------------------|-------------------------|----|----------------------------|----|-------------------------|----|------------------------------|----|
|                  | F                       | %  | F                          | %  | f                       | %  | F                            | %  |
| <b>PRE TEST</b>  | 31                      | 52 | 27                         | 45 | 2                       | 3  | -                            | -  |
| <b>POST TEST</b> | 1                       | 1  | 3                          | 5  | 44                      | 74 | 12                           | 20 |

Table 3. Comparison of pre and post test mean sd, t and p values of knowledge scores on dental hygiene among school children N=60

|           | Mean | Standard deviation | P-value | t- value | Result                         |
|-----------|------|--------------------|---------|----------|--------------------------------|
| Pre-test  | 2.9  | 2.9                |         |          | The intervention was effective |
| Post-test | 6.7  | 16.6               | <0.001  | 3.66     |                                |

In the pre-test mean score was 2.9 with an SD of 2.9 Whereas in post test mean score of 6.7 with SD16.6 and the obtained p-value were significant at the level of p <0.001.the obtained t – value of 3.66.



#### 4.3. Association between the pre-test knowledge scores with the selected demographic variables of school children

The association between the pre-test knowledge scores with selected demographic variables. Age in years, gender, standard, no of children in the family, previous dental visit, and previous toothache experience were not significant.

### 5. Discussion

Knowledge of proper oral hygiene practices is one of the key factors in maintaining good oral health. School-based oral health programs can benefit a wide group of children with extremely low costs in improving oral health knowledge and behavior. Games can make studying more entertaining and have been widely utilized for study by students and teachers across all age groups and areas of education.

According to Cinku Angeline, S (2016), Among 500 children, 177(34%) were affected by dental caries, which was identified using the DMFT score; Babitha Abiel (2022) found that most of the children, 80 (45.19%) had dental

caries. Whereas, In this study, out of 225 children, 60(27%) of the school children have tooth decay.

According to Cinku Angeline, S (2016), While comparing the pre-test and post-test scores of knowledge and practice on dental caries and hygiene, there was a significant difference between the tests which indicates  $t = 28.77$  and  $t = 8.24$  at  $(p < 0.05)$ . Where in this study, the obtained p-value was significant at the level of  $p < 0.001$ , the obtained t – value 3.66. Babitha Abiel (2022), they showed that there was a significant improvement in the knowledge score  $t = 28.77$  ( $p < 0.05$ ).

Mrs. Thilaga mary ,V. Chandrakala (2022) concluded that the Play Way method of Teaching Dental Hygiene was found to be effective in improving the level of Knowledge among School Children, and they were found to be statistically highly significant at  $p < 0.001$ . Similarly, this study also concluded that the play way method of teaching was effective.

### 6. Conclusion

The study revealed that school children were prone to get dental caries, which causes discomfort. The knowledge level of dental hygiene and dental problems is poor in the pre-test among school children. Through the play way method of teaching (snake ladder game), knowledge level was improved among the school children regarding dental hygiene.

### Acknowledgment

I acknowledge the Institutional Human Ethics committee of PESIMSR, the school's headmaster.

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