

# Impact of Planned Health Education on Knowledge and Practices of Oral Hygiene among Children in Selected Primary Schools of Karad Taluka

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**Abstract:** Oral health is an important aspect of general health in infants and children and impacts the quality of life and health outcomes. In India, the prevalence of dental caries is Worldwide, 60–90% of school children and nearly 100% of adults have dental cavities. The school based activities, regular oral health programs should be conducted in schools, to reach large number of children. At the school age, children are receptive to guidance and familiar with the learning environment and culture. **Methodology** -The study subjects comprised of school children studying in 3<sup>rd</sup> to 7<sup>th</sup> standard between 8-12 years of age in their schools of Karad Taluka included in the study. In the present study 14 Zilla Parishad schools in rural area were included. From all villages' schools, all school children of age group of 8- 12 yrs studying in 3<sup>rd</sup> to 7<sup>th</sup> std. school were studied which comprised of 1388 study subjects. **Results:** In the present study total 14 schools from 12 villages that lie in radius of 10 km. from Krishna Institute of Medical Sciences Deemed University, Karad were selected for the study. Total 1388 school children were participated in the study. Of these 705 (50.8%) were male and 683 (49.2%) were female. Maximum number of school children 174 (12.5%) were from school of Wing, and very minimum 30 (2.2%) were from school of Potale. School wise male female proportion revealed that high proportion of male and female school children were from Kapil (64.95) and Jakhinwadi (60.9%), respectively. The difference in the proportion of males as well as of females in different schools was significant (Chi-square value = 22.573, p = 0.0471).

**Keywords:** Health Education, Knowledge, Practices, Oral Hygiene, Children

## 1. Introduction

A smile is the shortest distance between two people. To make sure that your smile reflects the best about you is to practice good oral hygiene.

Oral health is an important aspect of general health in infants and children and impacts the quality of life and health outcomes.<sup>1</sup> Although dental caries' levels have declined and stabilized the world over, the problem of early childhood caries (ECC) has remained persistent in many areas of the world affecting certain segments of society, especially the socially deprived<sup>2,3</sup> who remain at high-risk to this disease. The factors associated with ECC primary to high school children include low income families,<sup>4</sup> cultural differences,<sup>2</sup> child temperament,<sup>5</sup> fewer dental visits,<sup>6,11</sup> lower educational level of the mother,<sup>7,13</sup> low levels of oral health knowledge among mothers,<sup>8,15</sup> inadequate oral hygiene<sup>6,9,10</sup> and a highly cariogenic diet in these children.<sup>6,9</sup> In many countries, the number of children brushing their teeth is very unsatisfactory including India.<sup>11</sup>

IN INDIA, THE PREVALENCE OF DENTAL CARIES IS WORLDWIDE, 60–90% OF SCHOOL CHILDREN AND NEARLY 100% OF ADULTS HAVE DENTAL CAVITIES.<sup>12</sup> AS PER THE W.H.O. NEWS ORAL HEALTH FACT SHEET N°318 APRIL 2012.

The school based activities, regular oral health programs should be conducted in schools, to reach large number of children. At the school age, children are receptive to

guidance and familiar with the learning environment and culture.<sup>11</sup>.

Hence the present study was undertaken in schools of karad Taluka in rural area.

## 2. Aim and Objective

To assess effectiveness of health education on knowledge and practices of oral hygiene of children.

## 3. Methodology

The study subjects comprised of school children studying in 3<sup>rd</sup> to 7<sup>th</sup> standard between 8-12 years of age in their schools of Karad Taluka included in the study.

### Sample and Sampling Technique

In the present study 14 Zilla Parishad schools in rural area were included. From all villages' schools, all school children of age group of 8- 12 yrs studying in 3<sup>rd</sup> to 7<sup>th</sup> std. school were studied which comprised of 1388 study subjects.

**After taking ethical committee's permission** the present study was conducted to find out the impact of health education on knowledge and practices of oral hygiene, among children from randomly selected schools of karad Taluka. A structured questionnaire for assessing knowledge and practices of oral hygiene was prepared validated from expert via. Paediatrician, dentist, community medicine etc.

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and modified accordingly used for data collection after procuring official permission of Head masters(principals) of these schools and day of study was planned with their consent.

Pre test was conducted on all study subjects of that school in the batches of 20-25 students only, for better understanding by them and then health education was given. In two session of 30 minutes After 3 weeks post test was conducted to same subjects.

Data was analysed by giving one Score was given for each scientifically correct response and zero for wrong in the knowledge and practices based questions of the oral hygiene questionnaire .

Knowledge as well as practice score was categorized as 'POOR' if the respective score was  $\leq 7$  i.e.' wrong responses and 'GOOD' if respective score was  $< 7$  i.e. 8,9,10 correct responses.

The researcher administered the questionnaire for the pre-test. The duration of data collection for sample was given 30 minutes. Then after collecting the answered pre test questionnaires, from all subjects of respective school health education was given in groups of 25-30 students at a time for one hour in two sessions Demonstration of teeth brushing, gum massaging, tongue cleaning shown on dental model with the actual tooth brush, finger and tongue cleaner. Poster charts were shown with detail explanations on anatomy of teeth, process of tooth decay, healthy teeth, and appearance of decayed teeth, gum, and healthy diet.

## 4. Results

In the present study total 14 schools from 12 villages that lie in radius of 10 km. from Krishna Institute of Medical Sciences Deemed University, Karad were selected for the study.

Total 1388 school children were participated in the study. Of these 705 (50.8%) were male and 683 (49.2%) were female. Maximum number of school children 174 (12.5%) were from school of Wing, and very minimum 30 (2.2%) were from school of Potale. School wise male female proportion revealed that high proportion of male and female school children were from Kapil (64.95) and Jakhinwadi (60.9%), respectively. The difference in the proportion of males as well as of females in different schools was significant (Chi-square value = 22.573,  $p = 0.0471$ ). (Table no. 1).

**Table 1:** Village wise distribution school children.

Name of the village	Male	Female	Total
Malkapur	69(60%)	46(40%)	115
Agashivnagar	67(59.3%)	46(40.7%)	113
Chachegaon	56(49.1%)	58(50.9%)	114
Wing	83(47.7%)	91(52.3%)	174
Yenake	45(46.4%)	52(53.6%)	97
Potale	15(50.0%)	15(50.0%)	30
Jakhinwadi	36(39.1%)	56(60.9%)	92
Kapil	24(64.9%)	13(35.1%)	37
Golshwar	51(42.1%)	70(57.9%)	121
Gharewadi-1	41(54.7%)	34(45.3%)	75

Gharewadi-2	55(49.1%)	57(50.9%)	112
Kole-1	43(50.6%)	42(49.4%)	85
Kole-2	37(49.3%)	38(50.7%)	75
Nandalapur	83(56.1%)	65(43.9%)	148
<b>Total</b>	<b>705(50.8%)</b>	<b>683(49.2%)</b>	<b>1388</b>

Very high number, 518 (37.3%), school children were of age 9yrs. However, high proportion of male school children belonged to age 8yrs while high proportion of female school children belonged to age 12yrs. However, there was no significant difference in the proportion of males as well as of females at different ages (Chi-square value = 4.845,  $p = 0.3036$ ). (Table 2).

**Table 2:** Age wise distribution of school children

Age (years)	Male	Female	Total
8	81(54.4%)	68(45.6%)	149
9	267(51.5%)	251(48.5%)	518
10	149(53.0%)	132(47.0%)	281
11	97(50.3%)	96(49.7%)	193
12	111(44.9%)	136(55.1%)	247
<b>TOTAL</b>	<b>705(50.8%)</b>	<b>683(49.2%)</b>	<b>1388</b>

It was observed that all 1388 children were having their mother and father with them . High number of mothers 487(31.1%) were learned upto primary while high number of fathers 513(37.05%) learned upto secondary. In all total 84.9% of mothers and 86.2% of fathers were literate. The proportion of literacy was similar in mothers and fathers. However, there was significantly less proportion of illiterate mothers as well as of fathers as compared to literates (Chi-square value = 69.666,  $p < 0.0001$ ).

Village wise mean knowledge score of children regarding oral hygiene, before intervention, ranged between 3.80 and 4.61. The overall mean knowledge score was 4.21 with S.D 1.23. It revealed that village wise there was no significant difference in the mean knowledge score of children before imparting the education ( $F_{13,1374} = 1.338, p=0.263$ ).

The mean practice score before intervention ranged from 5.97 to 6.78. The overall mean practice score was 6.43 with S.D 1.12. It revealed that village wise there was no significant difference in the mean practice score of children before imparting the education ( $F_{13,1374} = 0.660, p=0.654$ ).

Since village wise knowledge and practices score was found similar, further statistical analysis was carried out by combining school children of all villages together.

Correct responses received on question wise knowledge aspect regarding oral hygiene among school children before and after health education are given in Table 3. It revealed that proportion of correct responses for each question was significantly increased in post education assessment. Pre education assessment of question nos. 8 & 5 were found with very less proportion of children with correct answers in comparison to other questions. However, post education assessment revealed that proportion of children with correct answers for each question, except question no. 10, was more than 90%.

**Table 3:** Question wise correct responses about knowledge of oral hygiene

Q.N	Knowledge aspect	Pre-education n (%)	Post-education n (%)	$\chi^2$ value **
1	Teething occurs twice in human life-What are their names?	1056 (76.1)	1380 (99.4)	351.8
2	What is the significance of teeth in our body?	423 (30.5)	1369 (98.6)	1409
3	How do healthy teeth look?	1228 (88.5)	1384 (99.7)	157.7
4	What do healthy gums look like?	730 (52.6)	1385 (99.8)	851.903
5	What causes dental decay?	273 (19.7)	1378 (99.3)	1825
6	How does plaque look?	634 (45.7)	1380 (99.4)	1007
7	What problems you have to face when you suffer from dental caries?	813 (41.4)	1380 (99.4)	1121
8	What is the advantage of clean and healthy teeth?	196 (14.1)	1307 (94.2)	1791
9	When do you know you have tooth decay?	493 (36.8)	1291 (93.0)	997.930
10	What are the signs and symptoms of gums disease?	419 (30.2)	1122 (80.8)	720.9

\*\* : p<0.001 (highly significant difference)

The total of correct responses regarding knowledge aspects given by each child was determined. It was observed that there was only one child with no any correct response while only one child with all correct response in pre education. In pre education assessment there were 1138 (82%) children responded correctly for 3 to 6 questions out of 10 questions on knowledge.

Table 4 depicts drastic change in the proportion of children with Good knowledge score in post intervention responses. It was changed from 3.0% to 99.8%.

**Table 4:** Knowledge category of children about oral hygiene

Knowledge	Pre Intervention	Post Intervention
	No. (%)	No. (%)
Poor (<=7)	1347 (97.0)	3 (0.2)
Good (>7)	41 (3.0)	1385 (99.8)
Total	1388	1388

In depth assessment of change from pre to post intervention knowledge about oral hygiene revealed that 99.8% children amongst poor pre intervention knowledge acquired good knowledge in post intervention assessment. Only 0.2% could not improve their knowledge about oral hygiene.

In pre education mean knowledge score was 4.2 with s.d.1.2 while in post education mean knowledge score was 9.6 with S.D. 0.6. The comparison of pre and post correct knowledge responses revealed that the mean improvement in knowledge after education was 5.3 with SD 1.7. This improvement was highly significant (t =117.931, p<0.001).

Correct responses received on question wise practice aspect regarding oral hygiene among school children before and after planned education are given in table no.4.

It revealed that proportion of correct responses for each question was significantly increased in post education assessment. Pre education assessment of question nos. 4 & 1 were found with very less proportion of children with correct answers in comparison to other questions. However, post education assessment revealed that for question nos.2, 3, 4, 5, and 10; proportion of children with correct answers was more than 80%.

**Table 5:** Question wise correct responses about practices of oral hygiene in children

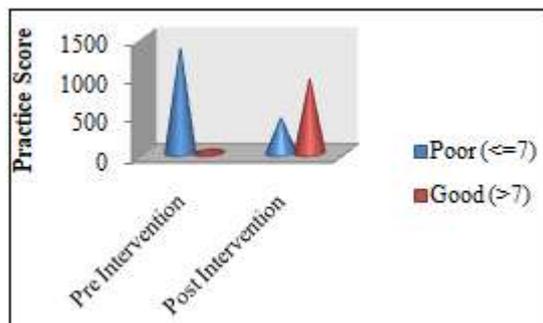
Q.N	Practice aspect	Pre education n(%)	Post education n(%)	$\chi^2$ value **
1	How many times should you clean our teeth daily?	181(13.0%)	909(65.5%)	800.57
2	Which dentifrice should you not use for cleaning the teeth?	873(62.9%)	1125(81.1%)	113.41
3	With what aid will you clean your teeth?	939(67.7%)	1223(88.1%)	168.67
4	How frequently should you change your toothbrush?	137(9.9%)	1321(95.2%)	2025.1
5	What is the ideal movement of brush for cleaning the teeth?	209(15.1%)	1226 (83.3%)	1492.0
6	When do you clean your tongue?	667(48.1%)	1085(78.2%)	270.36
7	With what you should clean your tongue?	802(57.8%)	783(56.4%)	0.539
8	What should you eat to keep your teeth healthy?	557(40.1%)	1081(77.9%)	408.91
9	What should you eat to keep your gums healthy?	387(27.9%)	1039(74.9%)	613.0
10	How will you avoid or prevent teeth damage?	180(13.0%)	1300(93.7%)	1815.5

\*\* : p<0.001 (highly significant difference)

There was obvious improvement in Good practice score. The proportion of children with good practice increased from 3.5% to 67.9% in post intervention assessment. Table 6.

**Table 6:** Practice category of children about oral hygiene

Practice	Pre Intervention	Post Intervention
	No. (%)	No. (%)
Poor (<=7)	1340 (96.5)	446 (32.1)
Good (>7)	48 (3.5)	942 (67.9)
Total	1388	1388



**Figure 1:** Practice category of children about oral hygiene

In depth assessment of change from pre to post intervention practice about oral hygiene revealed that 68.5% children amongst poor pre intervention practice acquired good practice in post intervention assessment. However, 31.5% could not improve their practice about oral hygiene.

In pre education mean practices score was 3.5 with S.D. 1.7 while in post education mean practices score was 7.9 with S.D. 1.3. The comparison of pre and post correct practices responses revealed that the mean improvement in practices after education was 4.4 with SD 2.2. This improvement was highly significant ( $t = 75.130, p < 0.001$ )

## 5. Discussion

Behaviour which is learnt during child's early years becomes deeply ingrained and resistant to change. If positive dental health routines are taught in early childhood, later dental health education intervention can be of a reinforcing nature. Jurgensen et al.<sup>13</sup>

The present study assessed the impact of health education on knowledge and practices regarding oral hygiene among children in selected schools of Karad Taluka. The sample population was selected from 14 different Zilla Parishad schools across the Karad Taluka. A total of 1388 children in the age group of 8 to 12 years from these respective schools were assessed in the study. The data was collected using structured questionnaires.

The present employed the use of a 20 question questionnaire. The questions were divided as – 'knowledge' questions (question number 1 to 10) regarding oral hygiene and 'practice' questions (question number 11 to 20) regarding practices for the maintenance of oral hygiene. The children were assessed using the questionnaires, before the oral health education was imparted and 3 weeks later, to determine the impact of the education.

In case of the children, it was observed on analysis of the results of the knowledge questions in the pre education assessment, revealed that 82% of the children marked 3 to 6 correct responses out for the initial 10 knowledge based questions.

It was observed that the children knew about dental caries (41.4%) and dental plaques (45.7%) while did not know much about dental decay (19.7%) or gum diseases (30.2%). (Table 6) These results were lower than those observed by Okemwa KA<sup>14</sup> AFM Sarwar et al.<sup>28</sup> may be due to different

place/ country/education status they had a fair understanding about dentition (76.1%) which was more than 72.78% as seen in a study by Fatima Chaudhary et al.<sup>29</sup>, the appearance of healthy teeth (88.5%) and healthy gums (52.6%) as compared to 33.89% seen by both Al-Omiri et al.<sup>16</sup> and Fatima Chaudhary et al.<sup>15</sup> while they lacked knowledge about the significance of teeth (30.5%) and the advantages of having healthy and clean teeth (14.1%) which was similar to the findings of Okemwa KA et al.<sup>14</sup>

On analysis of the results of the post education assessment, it was determined that 96.3% of the children answered with 9 or 10 correct responses, while 3.7% answered with 7 or 8 correct responses.

In this study the pre education assessment mean knowledge score (Table 8) for the children was  $4.2 \pm 1.2$  while the post education assessment mean knowledge score was  $9.6 \pm 0.6$ . This revealed a significant mean improvement in knowledge after the health education of  $5.3 \pm 1.7$ . Various studies reported by Thomas S et al.<sup>17</sup>, Martignon S et al.<sup>18</sup>, Sri Wendari et al.<sup>19</sup> have also shown a gain in knowledge scores after health education as an intervention.

In order for an educational message about oral health to be effective it must successfully persuade the listener to avoid behaviours that could cause the disease and practice behaviours that promote health Kanellis MJ et al.<sup>5</sup>. It was observed in this study on analysis of the results of the practice questions in the pre education assessment, that there were 5 children without any correct answers while 8 children with all answers correct. The results of the pre education assessment also revealed that 81.8% of the children were correctly practicing 2 to 5 practice aspects out of 10.

It was observed in the Present study regarding knowledge about oral hygiene practices that most children lacked understanding when it came to knowing how many times teeth should be cleaned (13%), replacement of tooth brushes (9.9%), preventing damage to teeth (13%), ideal methods to use a toothbrush while brushing teeth (15.1%) food items that help keep the gums healthy (27.9%). The children had fair knowledge about things like dentifrices that should not be used (62.9%), cleaning aids (67.7%), tongue cleaning frequency (48.1%), tongue cleaning aids (57.8%) and food items that help keep your teeth healthy (40.1%). Majority studies were found children were aware about dental cleaning aids that is tooth brush and tooth paste. Athanase et al.<sup>20</sup> has seen 97.1% using tooth brush, paste but there are no studies seen about tongue cleaner is used for tongue cleaning or how often teeth brush to be replaced, gums to be massaged. 62.26% said high sugar causes dental decay by Rafi Ahmad et al.<sup>21</sup> Sayegha et al.<sup>22</sup> seen that children were given savoury snacks 82%, confectionary 76%, tea with sugar 42%. Knowledge about calcium, vit C. essential elements of were 45.0%, 17.22% as per Fatima Chaudhari et al.<sup>15</sup>

On analysis of the results of the post education assessment, in this study it was determined that 97% of the children had 6 or more correct responses, while 3% had 4 or 5 correct responses. The number of children with correct practices of all 10 aspects those to 11.3% in post education assessment.

The pre education assessment mean practices score for the children was  $3.5 \pm 1.7$  while the post education assessment mean practices score was  $7.9 \pm 1.3$ . This revealed a significant mean improvement in practice after the health education of  $4.4 \pm 2.2$ .

It was found that 0.4% children used their fingers to clean their teeth which lower as compared to a study by Rakesh KG et al.<sup>23</sup> in which it was 15.6%.

Present study result shows that 99.6% used a toothbrush to clean their teeth and 100% used toothpaste as a dentifrice (Table 14) which was higher as compared to studies by Rakesh KG et al.<sup>23</sup> in which it was 53.6%, Lonim Prasai Dixit et al.<sup>24</sup> in which it was 86% and Basanta KB et al.<sup>25</sup> in which it was 93.86%. Toothbrush and toothpaste were the most commonly used oral hygiene aids, similar to findings in studies done by Rakibul et al.<sup>26</sup>, 92.55% Basanta kumar et al.<sup>25</sup> seen 93.86%. Lin et al.<sup>27</sup> this could be effect of media. But less than present study seen by Rafi Ahmad et al.<sup>21</sup> that is 58.4% where as 66.8% were not using tooth brush found by AFM Sarwar et al.<sup>728</sup> Bangladesh rural area it could be lack of awareness.

It was observed that 1.6% brush twice a day (on waking up in the morning and before going to sleep at night) as compared to studies by Seema Divan et al.<sup>29</sup> in which it was 4.1%, Baral et al.<sup>30</sup> in which it was 1%, Lonim Prasai Dixit et al.<sup>24</sup> in which it was 24%, Athanase Emmanuel et al.<sup>20</sup> in which it was 24%, Harikiran AG et al.<sup>31</sup> in which it was 38.5%, Y H Al-Dlaigan et al.<sup>32</sup> in which it was 60%, Ling Zhu et al.<sup>33</sup> in which it was 44%, Blinkhorn AS et al.<sup>34</sup> in which is higher 71.1%, Manal Ibrahim et al.<sup>35</sup> in which it was 96% and Okemwa K A et al.<sup>28</sup> in which it was 48%. This is because of poor oral health awareness resulting in faulty practices<sup>28</sup>

Our observations from the study revealed that providing information to the teachers and the children over time had a big impact on their awareness regarding oral health. Their ignorance or inability to employ this knowledge in to practice and take better care of their dental health can be better addressed by repeated counselling and practical assistance provided over a longer period of time until they put their knowledge into everyday practice.

It can be inferred from the above that the oral hygiene efficiency of the school children improved significantly due to the oral health education imparted to the children. The oral health education program conducted was effective in improving the knowledge levels regarding oral hygiene and oral health practices of most children. This was in accordance with the findings of de Farias<sup>35</sup>, Fatima Chaudhary et al.,<sup>15</sup>

The analysis of the results observed in the study has brought to light the fact that the knowledge and practices regarding oral health are poor and need improvement. The school population of today is the adult population of tomorrow, they should be educated so that a sense of responsibility would develop in them about oral health. Studies on oral health assessment and dental health education of children, at an early age help in improving preventive dental behavior and

attitudes which is beneficial throughout their lifetime. Knowledge imparted through these programs would go a long way in maintenance of oral health. Systematic community oriented oral health promotion programs would also be a very effective medium for early education. Along with the students, the teachers should be encouraged to participate in workshops related to oral health so that they can understand and impart the required knowledge to more of their students. It is believed that good oral habits introduced to the child during the primary stage of socialization are likely to stay with it into later life. This is in accordance with the study conducted by Martignon S et al.<sup>18</sup>, Wenhall I et al.<sup>19</sup> and Rong WS et al.<sup>37</sup> As the school stands to be the most important source of development in a child's life, it should host regular dental health checkups and awareness campaigns to improve the oral health of children. It may be concluded that the greatest need of oral health education is at an early age including proper instruction of oral hygiene practices and school based preventive programs which would help in improving preventive dental behavior and attitude which is beneficial for a lifetime.

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