



Assessment of Levels of Oral Hygiene Awareness, Knowledge, Attitude and Practice among the Students of a Government School in Karachi

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Authors' contributions

This work was carried out in collaboration between both authors. Author RB designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors RB and KR managed the literature searches and performed the statistical analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: The object of this study was to assess the levels of oral hygiene awareness, knowledge, and practice of the children of a Govt. school belonging to low socioeconomic class in Karachi, and to attract more of the health promotion programs and campaigns towards these less privileged areas so that awareness regarding oral hygiene and health may be emphasized upon them and encourage them about the benefits of a healthy oral cavity.

Study Design: A cross-sectional study.

Place and Duration of Study: The study was conducted in Railway's Secondary School. Railway colony, near Kalapul, Karachi in February 2015 .

Methodology: This study was conducted to assess the oral health knowledge, attitude and practice amongst the students of a government school in Karachi. Sample: A total of 461 students (251 Males + 210 Females) participated in the study through a questionnaire that consisted of 24 closed-ended questions. The data was analyzed using statistical package for social sciences (SPSS)

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version 15 and results were accumulated by frequency distribution.

Results: It was observed that 97% of children (n= 446) demonstrated regular oral hygiene practice, results regarding knowledge were also good but bad eating habits were also found prevailing amongst them that need to be addressed.

Conclusion: Overall it can be said that the results relating to oral hygiene practice and knowledge were good but only 31% of the students visited the dentist and the concept of regular dental checkup was almost nil. Hence the need for continuing dental education through promotion programs is emphasized with justification.

Keywords: Oral hygiene knowledge; attitude; practice; low-socioeconomic status; government school children.

1. INTRODUCTION

Health is a fundamental human right and a worldwide social goal which is essential for the improvement of the quality of life of people [1].

According to the WORLD HEALTH ORGANIZATION (1946) "Health is the state of complete physical, mental and social wellbeing of a person and not merely the absence of disease and infirmity" [2].

Health and hygiene go hand-in-hand with each other. Maintaining hygiene of one's own self and also of the surrounding, enables participating in creating a healthy environment and body for the individual and for the whole society.

Attainment of health is impossible if the basic principles of hygiene are not implemented in our day to day life. Poor oral health has proven to have unfavorable effects on general health [3] hence hygiene practice should be initiated from the oral cavity.

It is said that mouth is the mirror of the body and the gateway to good health [4]. It not only performs the special role of mastication but also forms an integral part of a person's beauty and personality. People normally refrain from interacting and socializing with individuals who ignore their oral health care. Unsightly appearance of decayed, discolored teeth and the obnoxious odor completely destroys one's personality, leaving the person socially deprived. Dental problems also adversely deteriorate an individual's routine activities at school and work place causing ample loss of productive working hours throughout the year [5]. Dental problems may affect systemic health, too [6,7].

Young children suffering from oral/dental problems are 12 times more probable to have confined activity days [8]. Literature also reveals

that more than 50 million school hours per year are lost due to dental problems affecting the overall health and school performance of the child [9].

Oral hygiene maintenance may be a totally ignored practice in people of low socio-economic class of developing countries and the load is higher significantly in poor and deprived population [10]. A general misconception also prevails amongst them considering oral health being necessary only for esthetic reasons rather than recognizing its functional significance. Illiteracy, poverty and sparse availability of dental hospitals in their vicinity also adds to strengthen this concept. Whilst its importance is often underrated, the need for regular dental care cannot be overlooked [11]. Oral health knowledge and behavior is a prerequisite for enforcing health related behaviors [12].

Children and youth collectively form a large number of population of an area [13]. Assessing the levels of oral hygiene/ health awareness and knowledge amongst them gives us an idea about the status of our current dental service provisions.

Schools serve as a valuable platform and provide a supporting environment for promoting oral health among school children and reach over one billion children universally [14].

In Pakistan, the total Government expenditure on public sector education is only 12% of its federal budget. Overall, there are 256,088 educational institutions in our country out of which 71% are in public sector. The total student enrollment is 37,462,884 out of which 25,213,894 students are enrolled in public institutes [15]. This, along with scarce literature on dental health awareness, attitude, & oral health related behaviors prompt us to assess and proceed towards addressing this particular group of population.

Dentistry not only focuses on eradicating dental diseases, but also endeavors to render services towards the general public especially younger generation, to impart a positive oral health knowledge and attitude in them through education, instructions and self-motivation [16].

Research studies have also established an association between knowledge & better oral health [17,18].

Keeping this in view, many developing countries have introduced school based oral health education program in order to control the growing burden of dental diseases [19].

Oral health promotion through schools is recommended by WHO for improving younger generations' knowledge, attitude and behavior related to oral health education so that it may not only be the duty of the dental professional to recognize health problems but the community as a whole should strive to achieve and practice hygiene to attain a healthy mouth (oral cavity) [20].

It has been observed from previous studies that infrastructure concerning school education already exists in our country, but work needs to be done in order to develop it into "Health Promoting Schools"; it is necessary to reorganize and restructure it in terms of faculty training (teachers) and educational lectures [21]. The community will certainly benefit when such an awareness campaign is directed towards improving the education level of our school going children.

2. MATERIALS AND METHODS

2.1 Study Design

A cross-sectional study was conducted to assess the oral health knowledge, attitude and practice amongst the students of a government school in Karachi.

2.2 Place and Duration of Study

The study was conducted in Railway's Boys Secondary school, situated in Railway colony near Kalapul, South district of Karachi city on 17th February 2015. This study was a questionnaire based study.

2.3 Study Sample

A total of 461 students (251 Males + 210 Females) participated in the study. The sample

size was calculated using stat Calculator EPI info version 7.1 keeping confidence level of 95%. All the students studying in the school from grade 1 to 10th grade, were included in the study, irrespective of gender, age, socioeconomic status and ethnicity discrimination. The students who were absent on that particular day were excluded from the study.

2.4 Data Collection

All participants were requested to complete a 24- questions closed ended questionnaire encompassing to demographic details and evaluation of oral hygiene practice, knowledge, attitude, habits and parental awareness, adapted from Nitika Jain et al. [11] & Mahmoud K. Al-Omiri, Ahed M. Al-Wahadni, Khaled N. Saeed [22,23].

A prior written application stating the purpose of project was sent to school management and the principal for acquiring permission and facilitation in obtaining negative consent from the students' parents. The questionnaire was distributed amongst the students according to their grades. A minimum time of 15 minutes was allotted to each student to fill in the questionnaire with the assistance of dental professionals.

2.5 Data Analysis

The data was analyzed using statistical package for social sciences (SPSS) version 15 and results were accumulated by frequency distribution.

3. RESULTS AND DISCUSSION

In this study, a questionnaire was filled for the participants by a team of Dental professionals. A total of 461 participants were included in the study, out of which 251 i.e 54.4% were boys and 210 i.e 45.5% were girls. [Table 1]

Questions regarding oral hygiene practice were asked which showed that almost 96.7% (n=446) of the participants brushed their teeth and 3.3% (n= 15) did not brush their teeth in daily practice. 87.1% (n=400) of the participants used tooth brush and tooth paste as a mode of cleaning their teeth, whereas 3.3% (n=15) used finger with salt, 3% (n=14) used miswak, and 2.4% (n=11) used tooth brush with tooth powder for cleaning their teeth. Amongst those who brushed, majority i.e 50.8% (n=234) brushed once daily, 23.4% (n=108) brushed twice, 20% (n=92) brushed occasionally and 3.5% (n=16) brushed more than

twice regularly. 50.8% (n=234) of the participants reported using soft tooth brushes, 17.6% (n=81) used hard and 4.8% (n=22) used medium brushing technique adopted by majority of participants i.e 45.6% (n=210) for brushing were horizontal, 30.6% (n=141) used vertical, 4.6% (n=21) used circular, and 16.3% (n=75) used a combination of movements for brushing. 33.8% (n=156) of the participants brushed for 2 minutes and/or more than 2 min, 18.4% (n=85) brushed for 1 min and 11.7% (n=54) brushed for less than a minute. 81.6% (n=376) of participants brushed

in the morning, 4.6% (n=21) in the afternoon, 3.8% (n=18) at night, 1.7% (n=8) brushed after meals whereas 4.3% (n= 20) brushed in the morning and at night. [Table 2]

Table 1. Gender distribution

		Frequency	Percent %
Valid	Male	251	54.4
	Female	210	45.6
	Total	461	100.0

Table 2. Oral hygiene practice

Questions	Response	Frequency	Percentage %
Do you clean your teeth?	Yes	446	96.7
	No	15	3.3
How do you clean your teeth?	Neem stick	2	.4
	Miswak	14	3
	Finger and tooth powder	9	2
	Finger and salt	15	3.3
	Tooth brush and tooth paste	400	87.1
	Tooth brush and tooth powder	10	2.2
	Total	450	97.6
	Nil	11	2.4
How often do you clean your teeth?	Occasionally	92	20
	Once daily	234	50.8
	Twice daily	108	23.4
	More than twice	16	3.5
	Total	450	97.6
What type of brush do you use?	Nil	11	2.4
	Hard	81	17.6
	Soft	234	50.8
	Medium	22	4.8
	Never noticed	124	26.9
What brushing technique is used for brushing your teeth?	Total	461	100
	horizontal	210	45.6
	vertical	141	30.6
	circular	21	4.6
	combined	75	16.3
	Total	447	97
How long do you brush your teeth?	Nil	14	3
	less than 1 minute	54	11.7
	for 1 minute	85	18.4
	for 2 minute	155	33.6
	more than 2 minute	156	33.8
At what time do you brush?	Total	450	97.6
	Nil	11	2.4
	morning	376	81.6
	noon	21	4.6
	after meals	8	1.7
	at night	18	3.9
	Morning & noon	1	0.2
	Morning and after meal	2	0.4
	Morning & night	20	4.3
	After meals and at night	1	0.2
	Brushed at all times	3	0.7
	Total	450	97.6
	Nil	11	2.4

As far as oral hygiene knowledge is concerned, 82.4% (n=380) of the participants changed their tooth brush amongst which 7.8% (n=36) changed their brush annually (once a year), 42.1% (n=194) changed their tooth brushes once in 3 months, 3.9% (n=18) changed in every 6 months and about 33.2% (n=153) discarded their tooth brushes when they were useless. Approximately 88.1% (n=406) of the students did not have any knowledge about interdental aids. And those who did have the knowledge 6.5% (n=30) used tooth picks and 5.2% (n=24) used wooden sticks to aid in cleaning their teeth. 90.5% (n=417) did not use mouth wash and only 9.5% (n=40) did. Tongue was cleansed by 28.4% (n=131) and 71.6% (n=330) were unaware of the need to clean their tongues. 71.8% (n=332) of the participants rinsed their mouth after eating and 28.2% (n=129) did not. [Table 3(a)]

Bleeding from gums was reported by 48.2% (n=222) participants and 30.4% (n=140) experienced smell from their mouth. Only 31.7%

(n=146) of the participants had visited the dentist and amongst these 26% (n=120) visited when they had some dental problem, 3.5% (n=16) visit in a year and 0.4-0.7% (n=5) visited the dentist in every 6 and 3 months respectively. 92.6% (n=427) of the participants wanted to have clean teeth. [Table 3(b)]

It was noted from the data collected that 47% (n=216) of the participants did not consume any hazardous food item e.g. pan, chalia, tobacco etc. whereas 47.3% (n=218) consumed chalia and 3% (n=14) had pan. Results regarding frequency of consumption stated that and that too with a frequency of sometimes 31.2% (n=144) and a lot 11.7% (n=54). Eating habits showed that 11.7% (n=54) did not consume sweets whereas other children did consume chocolates, candies and fries sometimes. It was noted that 40.6% (n=187) of the participants consumed acidic Beverages sometimes, 12.1% (n=56) often, 10.6% (n=49) drank a lot of beverage whereas 36.7% (n=169) did not take acidic beverage at all. [Table 4]

Table 3(a). Oral hygiene knowledge

Questions	Response	Frequency	Percentage %
Do you change your tooth brush?	Yes	380	82.4
	No	66	14.3
	Nil	15	3.3
	Total	461	100
How often do you change your tooth brush?	When useless	153	33.2
	Once in 3 month	194	42.1
	Every 6 months	18	3.9
	Once a year	36	7.8
	Nil	60	13
	Total	461	100
Do you know about other interdental aids?	Yes	51	11.1
	No	406	88.1
	Nil	4	0.9
	Total	461	100
Do you use any of these interdental aids?	Floss	2	0.4
	Interdental brush	6	1.3
	Wooden stick	24	5.2
	Toothpicks	30	6.5
	Nil	395	85.9
Total	461	100	
Do you use mouth wash?	Yes	44	9.5
	No	417	90.5
	Total	461	100
Do you clean your tongue?	Yes	131	28.4
	No	330	71.6
	Total	461	100
Do you rinse your mouth after eating?	Yes	332	71.8
	No	129	28.2
	Total	461	100

Table 3(b). Oral hygiene knowledge

Questions	Response	Frequency	Percentage %
Have you ever noticed bleeding from your gums?	Yes	222	48.2
	No	239	51.8
	Total	461	100
Have you ever noticed smell from your mouth?	Yes	140	30.4
	No	321	69.6
	Total	461	100
Do you visit a dentist?	Yes	146	31.7
	No	315	68.3
	Total	461	100
How often do you visit the dentist?	Never	320	69.4
	Only In problems	120	26
	Once in 3 months	3	0.7
	Once in 6 months	2	0.4
	Once a year	16	3.5
	Total	461	100
Do you want your teeth to be clean?	Yes	427	92.6
	No	39	7.4
	Total	461	100

Parents of 78.1% (n=360) asked their children to brush their teeth, with personal supervision by 47.7% (n= 220) of the parents. 62.9% (n=290) also practiced oral care in front of their children for motivation. [Table 5]

3.1 Discussion

This study presented a complete overview of the oral health behavior, knowledge, attitude and practice in the govt. school children of Karachi aged between 5-19 years [23]. When this study was compared to other studies conducted in the neighboring countries it was observed that our school children demonstrated better dental knowledge, attitude & practice [22].

3.1.1 Oral hygiene practice

The results revealed that a high percentage (97%) of children in this study, brushed their teeth regularly. These results were better than the results obtained in a study [22] and concurrent to the study conducted by Ling Zhu et al. [24], 51% brushed at least once daily, and only 23.4% brushed the recommended twice daily protocol. This is lower than the results obtained by Harikiran et al (38.5%) [25] and WHO (49%) [26]. The primary mode of cleaning teeth for 87% of the children was with a tooth brush and tooth paste. 8.5% of the children exercised other less common modes such as use of miswak, finger and salt and neem stick.

Soft tooth brushes were used by 51% of the participants, and the brushing technique adopted

by majority of participants i.e 46% were traditional horizontal method, and 16.3% used a combination of movements for brushing.

Tooth brushing time of 2 min was implemented by 34% of the participants whereas 11.7% brushed for even less than a minute. The time of the day chosen by majority of the participants in this study i.e 81.6% was morning which was improved compared to 74% result (including both before & after breakfast) of the study conducted at Sheikhpura. However brushing at night was depressingly practiced by only 4% of our study population compared to 21% results of same study [27].

3.1.2 Oral hygiene knowledge

Results regarding oral health knowledge were good and higher than those obtained from a study [28] with 82.4% showing a positive attitude towards changing their tooth brushes amongst which 42% changing in every 3 months, 33.2% discarded them when they were useless whereas 7.8% replacing it annually (once a year). The ideal practice of changing tooth brushes every 3 months was observed among just 42% children compared to 72% in a comparable study [3].

There was poor awareness relating to interdental aids knowledge & approximately 88% of the children were ignorant about interdental aids. Amongst the 11% informed, 5% used wooden sticks and tooth picks to pick the debris from their teeth.

Table 4. Eating habits

Questions	Response	Frequency	Percentage %
Do you eat any of these food items?	Pan	14	3
	Chalia	218	47.3
	Tobacco	1	0.2
	Any other	1	0.2
	Pan & chalia	6	1.3
	Chalia & tobacco	2	0.4
	Pan, chalia & tobacco	2	0.4
	All of these	1	0.2
	None of these	216	47
	What is the frequency of consumption of these food items?	Often	43
Sometimes		144	31.2
A lot		54	11.7
Never		220	47.9
Total		457	99.1
Nil		4	0.7
total		461	100
Do you have any of these sweet food?	Chocolate	111	24.1
	Candies	21	4.6
	Chips	49	10.6
	Fries	4	0.9
	Chocolate & candies	16	3.5
	Chocolate & chips	19	4.1
	Chocolate & fries	2	0.4
	Candies & chips	4	0.9
	Chips & fries	1	0.2
	Choco, candies & chips	44	9.5
	Choco, candies & fries	6	1.3
	Candies, chips & fries	1	0.2
	All	120	26
	Nil	54	11.7
	Total	461	100
What is the frequency of consumption of these sweet food?	Often	73	5.8
	Sometimes	260	56.4
	A lot	69	15
	Never	58	12.6
	Total	461	100
How often do you consume acidic beverages?	Often	56	12.1
	Sometimes	187	40.6
	A lot	49	10.6
	Never	169	36.7
	Total	461	100

Table 5. Regarding parental motivation

Questions	Response	Frequency	Percentage %
Do your parents ask you to brush your teeth?	Yes	360	78.1
	No	100	21.7
Do your parent supervise you during your brushing?	Yes	220	47.7
	No	240	52.1
Do your parents practice oral hygiene at home?	Yes	290	62.9
	No	170	36.9

Mouth washes were not use by 90.4% children. Only 28.4% cleansed their tongue during brushing as a routine oral hygiene procedure but it was also noted that 72% did rinse their mouth after meals. Both results were less when compared with the results of another study [3].

Furthermore, 48.2% of the participants reported bleeding from their gums and 30.5% complained of halitosis.

There were 69% participants who had never visited a dentist, results contrary to 30% [29] and 46% [30] where children awareness regarding

dental visit was comparatively enhanced. 26% visited the dentist only when they had some dental problem, which is less as observed in a study conducted in Maharashtra [31] where 51% of students did not fear going to the dentist for regular checkups.

Lack of awareness about the other methods of oral hygiene maintenance and the principle benefits of regular dental checkups in preventing the dental ailments is a major flaw that should be addressed via public education and oral health promotion campaigns.

3.1.3 Harmful eating habits

Understanding about the dietary habits of the children and their attitude towards different food item such as areca nut, pan, chocolates, candies plus excessive consumption of soft drinks is essential for the oral health [32].

Results obtained from our study regarding eating habits were not satisfactory and almost 53% of children reported consuming pan, chalia (areca nut) tobacco sometimes during the day. This is relevantly better than the 79.6% & 79.9% results obtained in the studies [33,34] and other 47% denied consuming any of these in their lifetime comparable to study [34].

It is generally accepted that the prevalence of caries is related to the form in which sugar is ingested and the frequency of its consumption [35]. Sugars specifically refined sugars, sticky sugars and sugar alcohol have been evidently proven to be associated with an increased risk for caries occurrence [36] and 88% of our respondents showed averse results with frequent consumption of "bad sugars" on a daily basis. Despite the minimal 12% students who reported nil consumption of sweet were still higher than the 6% results in a study in Spain [37].

Acidic beverage (soft drink) consumption was observed in approximately 64% of the children which is less as compared to (77%) in a study [38].

Hence it is vital to spread awareness among our population to adopt healthy dietary habits and avoid the harmful foods which are a causative factors of many dental diseases.

3.1.4 Parental motivation

Role of parents in motivating and guiding their children to practice appropriate oral hygiene

procedures is very significant. Parental knowledge and attitudes toward oral health can promote significant oral hygiene behaviors & skills in their children [39]. Our study showed that 78.1% of the parents advised their children to brush regularly, 47.7% personally supervised them while 63% parents adopted practicing oral care in front of their children for their motivation and setting a role model for them to follow which is similar to the results of the studies [40,41].

Frequency of tooth brushing in parents is linked with frequency of tooth brushing in their children. Tooth brushing and oral hygiene practice in parents can affect the frequency and quality of tooth brushing in children, since children learn many of behaviors from their parents [42].

4. CONCLUSION

The results extracted from the findings of this study are that the oral hygiene practice among the school children is good which is discernible by 97.6% children demonstrating regular tooth brushing practice. Although this is appreciable yet their knowledge relating to awareness about other recommended methods of oral health care is poor and confined plus the conjunction of harmful eating habits, and lack of regular dental checkups can pose a risk of dental diseases. Hence there is a need to continue improving and promoting oral hygiene knowledge and awareness through education and oral health promotion campaigns. This will require collaboration of National & International authorities, dental colleges and public health departments to organize outreach programs for other govt. schools of the country as the majority of our children studying in govt. schools, belong to low socioeconomic class.

CONSENT

The school management i.e the principal and higher authorities facilitated in getting written informed consent from the participants' parents/guardians.

ETHICAL APPROVAL

All authors hereby declare that the study was approved by Bahria University's Ethics committee. We assure that while carryout the research, we observed the highest ethical standards. We maintained integrity at all times regarding data gathering. We have only reported

information that is in public domain and within the law. We have avoided plagiarism and fully acknowledged the work of others. While acknowledging the rights of all the research participants, we have compiled this research with all the ethical protocols outlined here:

- I. The permission of the school principal was obtained prior to research study being carried out.
- II. The permission of parents with written consent was obtained prior to study.
- III. Strict confidentiality was maintained and no names were included in the final data analysis.
- IV. No risk of life, or damage to any body part, organ or belonging was posed during the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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