



Research Article

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Integrated school-based child oral health education- An intervention with an impact

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Abstract

Objective: The aim of this study is to assess the impact of the health awareness campaigns and an intervention on overall oral hygiene of students. **Materials and methods:** A cohort study (prospective) has been conducted over a period of 1 year from September 2018- September 2019, a total of 340 students age between 6 to 12 years participated in the study. A self-administrated Questionnaire regarding oral hygiene habits and practices was designed and filled by the students. Same questionnaire was filled from the same students again after one year and the impact of oral health education was accessed. **Results:** Following the intervention, significant differences were found in the dental health. Time taken for brushing was improved. Majority of the participants who changed their toothbrush after more than a year, now changed their toothbrushes after every 6 months. Frequency of visiting the dentist for routine checkups also increased. **Conclusion:** Short term oral health education program and health awareness campaigns have potential merits in bettering the oral hygiene conditions and promoting health among the children. Coordinating efforts should be enhanced between school personnel, parents and health professionals to ensure long term benefits.

Keywords: Oral Health, Health awareness, Knowledge, Students, Brushing, flossing.

INTRODUCTION

Well-being is a fundamental human right and an overall social objective which is basic for the improvement of the quality of life of individuals [1]. According to the WHO (1946) health is not merely an absence of disease rather it is characterized as a state of complete mental, physical and social wellbeing [2]. A good oral health is the condition of mouth liberated from any disease influencing the oral cavity and its encompassing structures [3]. It has stayed as a basic aspect of a person's overall well-being and overall prosperity [4]. Oral health is defined as a "standard of health of the oral and related tissues which empowers a person to eat, talk and socialize without active disease, inconvenience or shame and which adds to general prosperity" [5].

According to a study done by Abdollahi M, it is obvious that environmental factors and socio-behavioral assume a significant part in keeping up great oral health [6]. This incorporates dietary status, tobacco smoking, alcohol, stress, hygiene, foundational conditions, etc [7]. Since the mouth is viewed as the reflection of the body, it is imperative to have a good oral health for keeping up a good general health. The act of keeping up the mouth clean and sound by brushing and flossing to forestall tooth decay and gum disease is depicted as Oral cleanliness [8]. With developing nation, Dental hygiene is poor with deficient and improper brushing of teeth, no washing of mouth after consumption of sweets. Utilization of toothbrush in underdeveloped regions is horribly restricted and toothpick is generally used for dental cleaning. Standard brushing of teeth after principal meals isn't rehearsed all around mainly because of lack of awareness [9]. Keeping up good oral hygiene is viewed as a lifelong habit. Additionally, these oral health habits are said to start in a beginning phase of life [10]. Children and youth on the whole form an enormous number of population of a territory [11]. Kids who experience poor oral health are multiple times bound to have more confined active days, including missing school, than the individuals who don't. Yearly, more than 50 million hours are lost from school because of oral ailments [12].

Education about health is any combination of learning experiences intended to encourage actions that are better for wellbeing. These actions or behaviors may be the responsibility of people, families, organizations or communities. Thus the scope of health education may include educational interventions for everyone. It has been all around recorded in dentistry and other fields that correct information or knowledge regarding health does not necessarily lead to desirable health conduct. Nevertheless, the knowledge might serve as a tool to engage population groups with accurate information regarding health and health care technologies, allowing them to take action to look after their health [13].

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Integrated health education and health promotion approach is essential in order to influence knowledge, attitude and behavior of youth for impressive oral health. Changes in knowledge, attitude and behavior according to basic behavior change theory such as the social learning theory (Bandura, 1977) [14] and health belief model (Becker, 1947) [15] might be because of usage of concerted approach including media, community and interactions among people. Dental health education program in improving oral hygiene status of the students has many obvious merits [16]. For effective Dental Health Education, several factors are important such as reinforcement of oral hygiene instructions and repetition [17]. Evaluating the degrees of oral hygiene/well-being awareness and information among them gives us a thought regarding the status of our present dental service arrangements. Schools provide as a significant platform and give a supporting situation for advancing oral health among younger students and reach more than one billion kids generally [18]. The World Health Organization has also recommended oral health promotion through schools for improving younger generations' information, mentality and conduct related to oral health instruction so it may not exclusively be the obligation of the dental expert to recognize health issues however the community overall ought to strive to accomplish and practice hygiene to achieve a healthy mouth (oral cavity) [19]. The aim of the study is to assess the impact of oral health education and awareness campaigns on oral hygiene status among 6-12 years old school children.

What we Add:

A few articles have discussed this issue previously in developing countries specially in Pakistan, Afghanistan and Bangladesh. The concepts underlying this study and intervention is to enhance its practical implication and to help the policy makers to adapt the policies of WHO health promoting school model in these developing countries. This literature highlighted the significant improvement in the behavioral aspects of children regarding oral health after educational campaigns which indicates that if these models are adopted and implemented on larger scale can help in achieving the goal of improved primary health care in a range of different countries.

METHODOLOGY

A before and after experimental study was conducted at a community school among 340 students. Before conducting the study Ethical approval was taken from the Ethical Research Committee of Islamic International Dental College, Islamabad (Ref. No. IIDC/IRC/2020/012/001). The sample size was calculated by WHO calculator. The study was conducted over a period of 1 year. The base line data was collected in the month of September 2018 and oral hygiene education was provided to the students and after one year in the month of September 2019 end line data (post intervention) was collected. The written consent from the school principal where study was done and from the participant's parents were also taken before commencing the study and the purpose of the study was also clearly explained to them. A onetime verbal consent was also taken from the students in the presence of their teachers.

School selection was based on the following criteria: (1) consent of the school authorities (2) no dental health education programs conducted in the past or during our study period. The study subjects were selected based on inclusion criteria (1) both male and female students from 6 to 12 years of age who were present in the school during the day of base line examination and were willing to participate in the study (2) deciduous and mixed dentition (3) good general health; exclusion criteria: (1) those who were absent on that day were excluded from the study. On the first visit each participant was interviewed using a specially designed questionnaire. The questionnaire reflected the key messages of the oral health awareness campaign, frequency and duration of brushing, the technique followed, the type and amount of tooth paste used, the mode of cleanliness

followed, time of brush replacement and flossing techniques. Information regarding their past experience and frequency of visits to the dentists if any and past experience with the awareness campaigns if done was collected. The data was collected by the trained dentists in the presence of the teacher. After filling the questionnaire oral health education was given to the participants, which included instructions on the importance of maintenance of oral hygiene, use of fluorides, use of proper oral hygiene aids, tooth brushing methods, dietary habits and dental attendance. Oral health education was boosted by using teaching resources such as chalks and blackboards. Daily twice brushing was advised for the prevention of bad breath and tooth decay. After one year investigators visited the same school and the same questionnaire was administered again to the same study subjects.

Data was entered and analyzed using IBM SPSS Statistics for Windows, Version 22.0. (IBM Corp., Armonk, NY, US). The comparison (mean and percentage changes) between the pre and post intervention was done for all the questions.

RESULT

An awareness campaign was carried for a duration of 1 year. 340 students were asked to fill out a simple questionnaire regarding their oral hygiene practices. Overall response of the questionnaire was good. Most of the participants were male (n=182). Most of the participants belonged to the age group of 6-7 years. Huge improvement was seen in the answers of the participants before and after the awareness campaign. When asked about the daily Hygiene practices, only 2 participants chose the option of brushing and flossing whereas. After the campaign, it increased to 179 (table 1). 73 of the participants did not practice any oral hygiene procedure before the campaign but it was noted that the number of participants drastically reduced to 5 after the campaign (Graph 1 and 2). Time taken for oral hygiene and frequency of brushing was improved from one minute to 2- 5 minutes (Table 1) and twice daily. Majority of the participants who changed their toothbrush after more than a year, changed their response to after every 6 months following the campaign (Table 1). Majority of the participants chose the option of not visiting their dentist in the last 12 months before the campaign but after the campaign, 265 of them visited once and 18 visited their dentist twice. (Table 1)

DISCUSSION

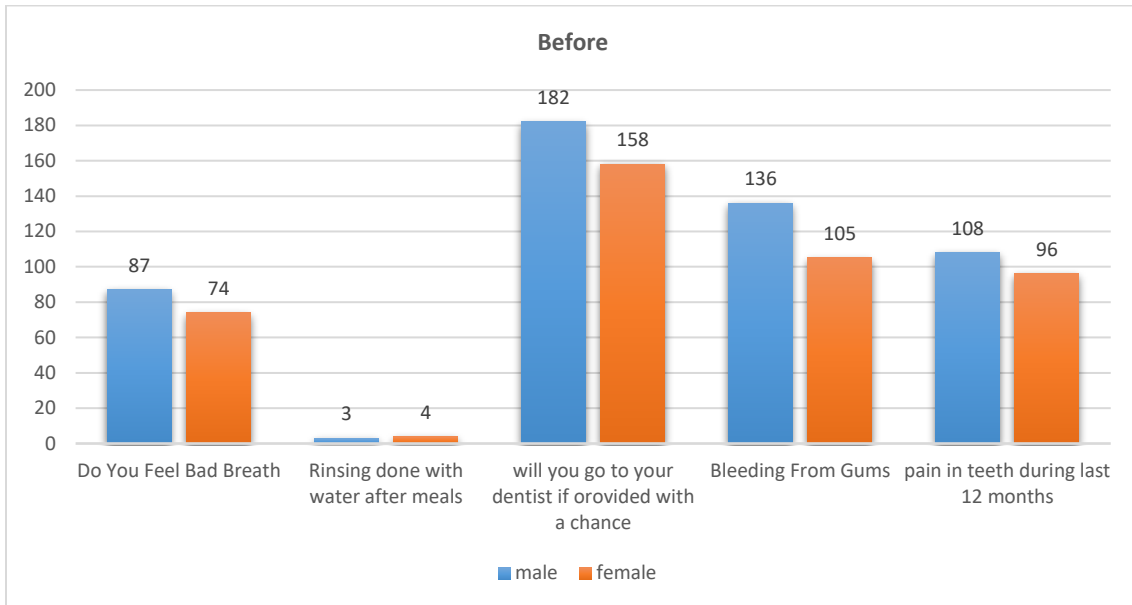
Health is considered to be the fundamental human right without being discriminated on the basis of culture, social conditions, race, religion and political belief [5]. Changing individual conduct from health harming to health advancing is a significant objective of intervention strategies [20]. One of the most important tool of public health, health promotion and an effective primary preventive method is health education [21]. Schools are considered to be the best platform to encourage healthy life styles and integrating approaches to health promotion that addresses both the school environment and individual behavior amongst children. The best way to promote health is to incorporate its importance, need, effective ways, procedures and instructions into the curriculum of primary and secondary schools [22]. The world health organization (WHO) in the Ottawa charter for health promotion reinforced the practice of health promotion in schools [23]. The WHO concept of health-promoting schools known also as a 'settings' approach provides a framework for those approaches which incorporate a formal health curriculum; promotion of a healthy school environment and ethos that can benefit pupils, teachers, and non-teaching staff alike; and engagement with families and communities [24]. The current investigation is focused on oral health of school going children before and after the awareness campaign. Self-induced habits like diminished sugar intake, use of fluoridated tooth paste, proper brushing technique, use of floss and mouth wash are mandatory along with regular dental checkups and dental health training for maintaining oral health [25].

Table 1: Showing the scores of students before and after the campaign

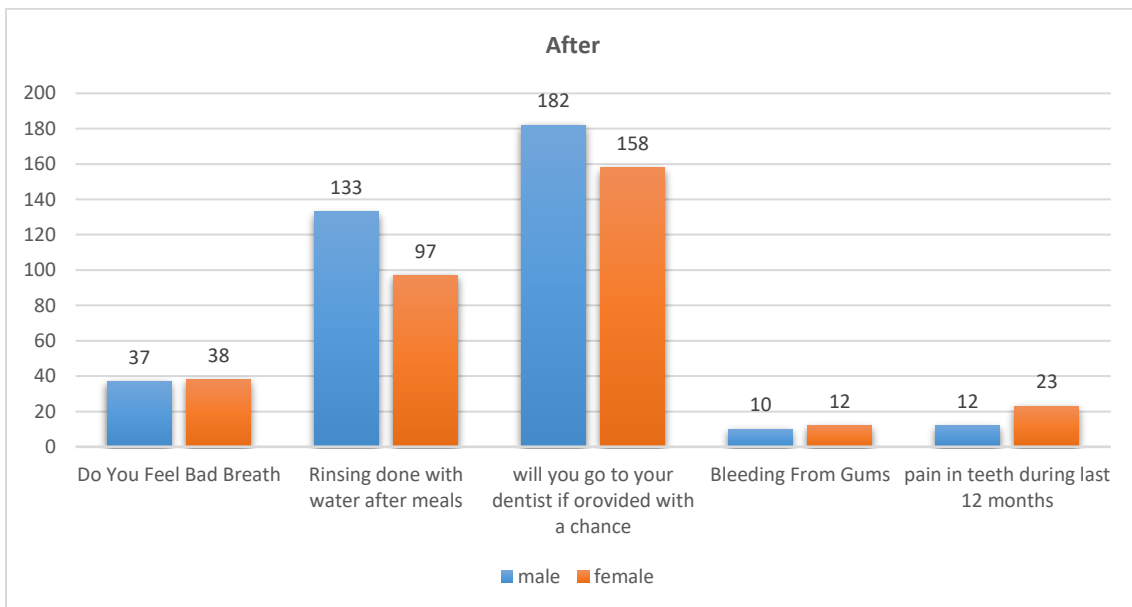
	Before	Mean \pm Std.	After	Mean \pm Std.	P value
Do You Feel Bad Breath	161(47.4)	1.53 \pm 0.5	(75(22.1)	1.78 \pm 0.4	0.0
Rinsing done with water after meals	7(2.1)	1.98 \pm 0.14	230(67.6)	1.32 \pm 0.5	0.0
Will you go to your dentist if provided with a chance	340(100)	1	340(100)	1	
Bleeding From Gums	241(70.9)	1.29 \pm 0.5	22(6.5)	1.9 \pm 0.2	0.0
Pain in teeth during last 12 months	204(60)	1.4 \pm 0.5	35(10.3)	1.9 \pm 0.3	0.0
Frequency of brushing		1.47 \pm 0.8		1.57 \pm 0.6	
i. Once daily	258(75.9)		155(45.6)		
ii. Twice daily	3(0.9)		175(51.5)		
iii. Once a day but not regular	79(23.2)		10(2.9)		
Condition of Oral hygiene		2.62 \pm 0.7		1.26 \pm 0.6	0
i. Good	25(4.4)		270(79.4)		
ii. Moderate	136(40)		52(15.3)		
iii. Poor	151(44.4)		16(4.7)		
iv. Very poor	38(11.2)		2(0.6)		
Visit to a dentist in last twelve month		2.55 \pm 0.8		1.39 \pm 0.8	0.12
i. Once	76(22.4)		265(77.9)		
ii. Twice	0		18(5.3)		
iii. Never	264(77.6)		57(16.8)		
Frequency of changing tooth brush		3.9 \pm 0.2		2.2 \pm 0.6	
i. Every three months	0		16		
ii. Every six months	0		243		
iii. Every year	28		72		
iv. More than a year	322		9		
Time taken for oral hygiene measure		1.15 \pm 0.4		2.44 \pm 0.7	
i. Five minutes	0		193		
ii. Two minutes	51		105		
iii. One minute	289		42		
Oral hygiene practices followed					
i. Brushing	264		144		
ii. Brushing + flossing	2		179		
iii. Brushing + flossing +mouthwash	1		12		
iv. None	73		5		

Table 2: Showing comparison between both genders

		Condition of oral hygiene				Total
		Good	Moderate	Poor	Very poor	
Gender	Male	6	81	73	22	182
	Female	9	55	78	16	158
Total		15	136	151	38	340



Graph 1: Showing the comparison among genders of a few questions before the awareness campaign



Graph 2: Showing the comparison among genders of a few questions after the awareness campaign

The concept of interdental cleansing with a filamentous material was introduced for the first time by Parmly in 1819. When used along with dentifrice and tooth brush, dental floss is able to remove the interproximal plaque, that is difficult to access through brushing only and help in reduction of the risk of interproximal caries, bleeding from gums, halitosis and periodontal disease [26]. It is strongly recommended that the daily tooth brushing should be accompanied with dental flossing however most of the people are reluctant towards using it either due to laziness, difficulties in flossing or negatively associated with their previous practice by some dentists [27]. In our study the prevalence of dental brushing alone is reported as 76.7% and less than 1% of the participants were aware of flossing before the education campaign however the awareness campaign had a significant impact and the number rose to 53%. A key element of preventive dentistry as proposed in many studies is the effective control of dental plaque. Studies have shown that proper tooth brushing improves hygiene levels and helps in significant reduction in dental caries in school and preschool children [28]. Studies on tooth brushing have been focused primarily on their effectiveness to remove plaque, either with manual

or electric toothbrushes. However, few studies have explored the patterns of tooth brushing and even fewer looked into the frequency of brushing [29]. In our study More than half of the total participants brush their teeth once daily in our research which is similar to the study conducted by Raima Bashir (51%) [30]. A study conducted in 2003 in Saudia found that 65% of the students were doing brushing at least once [31]. Before the campaign only 0.9% of the participants were brushing twice daily which is lower than the results obtained by WHO (49%) [32]. Tooth brushing time of 2 min was implemented by only 14% of the participants, very low percentage of the students had habit of rinsing mouth with mouth wash after meal before the campaign. Absence of both parental and kid oral wellbeing training may likewise clarify these findings [33]. Parents' inability to support or organize their children's tooth brushing efforts conflict with the findings from past investigations that reported absence of satisfactory degrees of information and attention to periodontal issues among Jordanian adults [33].

Gingival bleeding is commonly used to assess the status of oral hygiene of children. Significant reduction in the gingival bleeding was observed in our study after the campaign depicting the improvement in gingival health. Visiting a dental specialist is as yet not considered a preventive dental conduct, at present it just relies upon the treatment needs [34]. Only 22.1% of the participants had visited the dentist in the last twelve months before the conduction of our study. But after of one year the educational campaign 77% of the participants had visited the dentist. Absence of parental support and advice to visit the dental specialist may likewise add to the unpredictable dental attendance. Lack of guardians' regular dental visit may be reflected in their youngsters [31].

In contrast to the previous studies, [35,36] in which female participants showed better understanding and knowledge of oral health maintenance, higher frequency of flossing, rinsing after meals and tooth brushing, our study depicted that better understanding of oral hygiene has been shown by male participants than the females as evident from table 2. This contrast in results might be explained because of social and cultural differences

Since the examination of the questionnaire disclosed poor dental participation and insufficient oral hygiene habits, the oral health instruction stressing on legitimate technique for tooth brushing, the significance of oral cleanliness and standard dental checkup was provided. At the end of the study children appeared to have obtained more knowledge about oral hygiene. Their self-reported increase in use of oral hygiene aids and preservation of oral cleanliness as contrasted with the baseline, reflects their recently picked up information on expected conduct.

The current investigation has affirmed the overall conclusion that oral hygiene has still stayed as a disregarded and undiscovered significant social issue. Preventive oral health instruction is in momentary stage in Pakistan. Population based oral wellbeing advertising programs are yet to be executed and followed. Thus in this study attempts were made to depict the preventive oral information, practice and conduct of the considered population. Our investigation has indicated extremely restricted information on anticipation and preventive dental conduct.

CONCLUSION

The investigation revealed that the awareness campaign's plays a key role and will be fruitful if carried out at regular interval in all primary and secondary schools, inclusion of significance of oro-dental health in the school curriculum will have additional benefits. These campaigns' accompanied by oral hygiene aids will result in significant reduction in oro-dental emergencies and health promotion. Coordinating efforts should be made between school staff, health experts and guardians to guarantee long-term advantages of such programs.

There are some limitations of our study. (a) The adequacy has been seen following one year of the program yet the substantively of the effect requires more longitudinal studies. (b) The current investigation has been led in a little geographic territory, subsequently further multicenter studies are required for generalizability. (c) Long term estimation of improvements seen should be affirmed by additional investigations on the grounds that improved oral cleanliness in youngsters may exist just during the program or for a brief period from there on. (d) parental participation was excluded, which is generally fundamental for the accomplishment of long term advantages of the improvement of the program for implementation during their stay at home.

Conflicts of Interest

The authors declare no conflicts of interest.

Author's Contribution

Dr Beenish Khalil Rana: conceptualization, methodology, manuscript preparation, data collection and preparation; Dr Zarnab Rizwan: writing-review and editing, data curation; and Dr Ghina Rizwan: manuscript preparation, data analysis.

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