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Orginal Article

ROLE OF TEACHERS IN PROVIDING ORAL HEALTH EDUCATION TO SCHOOL CHILDREN

Ruqayya Sana[1], Aiman Niaz[2], Amir Hameed[3], Pashmina Nisar[4], Shakeel ur Rehman Khattak[5]

[1]Department of Community & Preventive Dentistry, Sardar Begum Dental College, Peshawar
[2]MPhil Community Dentistry Scholar, Khyber Medical University, Peshawar
[3]Department of Community Dentistry, Peshawar Dental College, Peshawar
[4]Department of Oral Biology, Sardar Begum Dental College, Peshawar
[5]Department of Operative Dentistry, Sardar Begum Dental College, Peshawar

ABSTRACT

Objectives: *To determine the role of schoolteachers in providing oral health education to school children and to asses schoolteachers' knowledge, practices, and the barriers in implementing oral health education among schoolchildren.*

Materials and Methods: *A cross-sectional study was conducted in different public and private schools of Peshawar. The sample size comprised of 311 schoolteachers who were recruited via simple convenience sampling. A structured questionnaire was used to collect data from teachers. Frequency tables were generated for the categorical variables. Chi-square test was employed to assess the association between categorical variables and p<0.05 was considered significant.*

Results: *Most participants (80.4%) worked in private schools, while the rest (19.6%) were in public schools. Around 21.2% of respondents reported integrating oral health into their teaching daily, while 22.5% did so weekly. Teachers exhibited strong knowledge regarding the causes and prevention of tooth decay (42.1%) and the impact of oral health on overall health (42.1%) while only 29.6% had excellent knowledge about signs and symptoms of gum diseases. Private school teachers were significantly more likely to emphasize the importance of dental visits compared to public school teachers (p=0.004).*

Conclusion: *The study revealed significant gaps in teachers' self-reported oral health knowledge, particularly in understanding fluoride's importance and recognizing signs of gum disease, despite acknowledging oral health's importance.*

Key words: *Oral Health, Schoolteachers, Health education, Schools, Health promotion*

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INTRODUCTION

Oral health plays a significant role in the emotional psychological and social development of a child. Oral health problems are common among children, with dental caries and periodontal diseases among the most frequently occurring[1,2]. Dental caries starting at the early age of life results in premature tooth loss leading to malformations in mixed and permanent dentition[2]. More sugary and sticky food consumption in children leads to more dental caries and gum diseases than adults. All these conditions are preventable if timely measures are taken focusing on good oral hygiene practices and routine dental visits. Evidence has shown that adequate knowledge and understanding of oral hygiene practices, including supervised tooth brushing, can promote children's

Correspondence:
Ruqayya Sana
Assistant Professor
Department of Community and Preventive Dentistry, Sardar Begum Dental College, Peshawar
Email: sana.ruqayya@gmail.com

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oral health and prevent oral disease[2]. Oral health education if emphasized through teachers can help us achieve our goal of healthy disease-free mouths lifelong[1].

Teachers play a vital role in molding the habits and behavior of children towards themselves and towards their health[1]. The children spend most of their time in school and teachers can utilize this time effectively to encourage healthy eating and encourage practices of better personal hygiene habits[3,4]. If we educate and empower teachers they can help minimize disease burden as well[5].

The prevalence of dental caries is more than 60 % and periodontal diseases are 56% in Pakistan, accounting for a huge burden[6]. In lower middle-income countries, effective use of school-based health education programs like personal oral hygiene awareness, effective use of fluorides, and other preventive programs to get fruitful results. Oral health education through teachers can be an effective way to increase awareness about causative and preventive factors of various oral diseases among children[1]. This can help to minimize fear associated with dental treatments among children[7,8]. Several studies have shown considerable improvement in student behavior towards oral hygiene if educated and directed by teachers[8].

WHO suggests that teachers should be involved in the planning and implementation of school-based education programs[2]. They can play their part as role models for students, parents and communities[1]. WHO has provided an oral health-promoting school framework including different responses to the oral health needs of children with interventions planned as well. The majority of these interventions require the active involvement of teachers, yet there has been little work done to understand the contributions of primary school teachers regarding oral health and the WHO framework in LMICs[2]. Data from various countries suggests successful implementation and effectiveness of school-based oral health programs and interventions when delivered through teachers[2,7,9]. Literature from LMICs suggests that teachers don't have enough knowledge about oral hygiene measures, thus educating their students regarding periodontal and gum diseases is very limited[8,9].

In Pakistan, around 90% of oral diseases remain unidentified[5]. The role of teachers in oral health education in Pakistan is unclear. This study aims to identify the role of public and private school teachers in the oral health education of students. This will also help us plan future oral health education interventions targeting schoolteachers for effective implementation of oral health education programs. Our objective of the study was to determine the role of schoolteachers in providing oral health education to school children and to asses schoolteachers' knowledge, practices, and the barriers in implementing oral health education among schoolchildren.

MATERIALS AND METHODS

A cross-sectional study among schoolteachers working in different private and public sector schools of Peshawar, Pakistan. A sample size of 331 schoolteachers was calculated using OpenEpi calculator. The sample size was calculated assuming a proportion of 73.29%[1], a precision of 5%, and a 95% confidence interval, with a 10% non-response rate. Ethical approval was obtained from the ethical committee of Gandhara University (ethical certificate no: GU/2024/159). A structured self-administered questionnaire was used to collect data. The questionnaire was pilot tested on 5% of the sample size. Participants were recruited via simple sampling techniques. Questionnaires were distributed among schoolteachers in 10 different schools in Peshawar. Written informed consent was obtained from each participant. All the collected data was entered and analyzed using SPSS 22. Mean and standard deviation were calculated for the age of each participant. Frequency tables and percentages were generated for categorical variable. The Chi-square test was conducted to determine association between different categorical variables and p values less than 0.05 were considered significant.

RESULT

In this study, a total of 331 questionnaires were distributed to schoolteachers of Peshawar. Only 311 complete questionnaires were received. The mean age of the participants was 31.95 + 7.17 years. Most participants were female (88.7%), while a small portion comprised of males (11.3%).

Most teachers, 68.5%, had a master's degree, while the remaining 31.5% held a bachelor's degree. Almost 80.4% of participants were employed in private schools, while 19.6% worked in public schools in Peshawar. More than half (58.5%) of the partici-

pants had more than 5 years of teaching experience. Nearly 29.3% of participants reported having 2–5 years of teaching experience, whereas only 12.2% had 1–2 years. The type of school showed insignificance with the frequency of incorporating oral health topic in routine teaching (p= 0.075), which is highlighted in table no 1.

Private school teachers were significantly more likely to discuss the importance of dental visits compared to public school teachers (p=0.004). The relationship of self-reported knowledge of teachers on different topics related to oral health and type of school showed significance which is highlighted in table no 2.

The primary methods used for teaching oral health included class lectures (77.8%), visual aids like posters and models (32.5%), and interactive sessions like role-playing and games (28.3%). A smaller proportion of teachers utilized the services of dental health professionals (10.0%), distributed pamphlets and booklets (6.8%), or did not employ any specific methods (3.9%).

Almost 34.7% of teachers had access to pre-existing oral health teaching materials available in schools, 30.5% created customized oral health education material, and 34.7% did not have access to any teaching materials.

Approximately 61.4% of teachers reported that oral health education and awareness programs were previously implemented in their respective schools, while 28.9% indicated that they had not. The remaining 9.6% were unaware of any such activity held in school. Nearly 42.1% of teachers believed that the school curriculum adequately addresses oral health, 34.1% felt it is addressed partially, 22.8% believed it was not addressed at all, and 1.0% were unsure.

The vast majority (94.9%) of respondents agreed that oral health is crucial for a child's overall well-being, while 2.6% did not perceive it as important. A significant majority of participants (76.5%) believed that poor oral health can negatively impact a student's academic performance. A smaller proportion (18.0%) thought it might have some impact, while 2.3% disagreed and 3.2% were uncertain.

Nearly 36.0% of teachers reported that students rarely report on oral health issues such as toothache or gum pain. However, 35.7% indicated occasional reports, 24.8% reported frequent occurrences, and 3.5% stated that they never encountered such reports. Teachers with more than five years of experience were more likely to report frequent oral health issues among students compared to those with less than five years of experience ($p<0.05$).

A significant majority of teachers (68.8%) informed parents when a student reported an oral health issue. Additionally, 22.2% suggested a dental visit, and 9.0% provided basic oral care advice. Almost 73.0% of teachers perceived the school environment as supportive of good oral health education and awareness, while 24.8% considered it neutral. Only 2.3% felt that the school environment is not supportive.

A significant majority (97.1%) of respondents agreed that teachers should play an active role in promoting oral health in schools. Only a small portion of teachers (1.3%) disagreed, and 1.6% were neutral. Different barriers were experienced by school teaching in providing oral health education in classrooms as illustrated in figure no 1.

Approximately 46.9% of teachers reported that they occasionally engaged in informal discussions about oral health with students outside of formal lessons, 28.6% frequently, 20.6% rarely, and 3.9% never. Around 73.0% of teachers believe that children from lower socioeconomic backgrounds are more susceptible to poor oral health, while 12.5% disagreed and 14.4% were uncertain.

The primary causes of poor oral health among school children, as perceived by teachers, included poor dietary habits, particularly high sugar intake (67.5%), lack of oral health knowledge (58.5%), limited access to dental care (35.4%), and inadequate

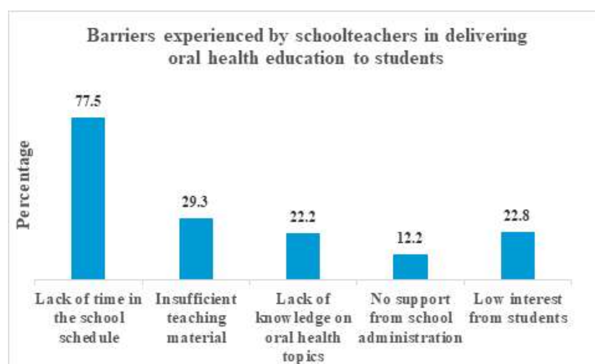

Fig 1: Barriers encountered by schoolteachers in delivering oral health education in classrooms

parental involvement in oral health (38.9%).

Almost 63.7% of teachers reported receiving support from dental professionals in promoting oral health education in schools. However, 30.2% indicated no such support, and 6.1% were unsure. A significant majority (63.7%) of teachers expressed interest in receiving additional training or resources to enhance their oral health education efforts.

DISCUSSION

This study was conducted to assess the role of schoolteachers in educating children about oral health. According to the current study one fourth of the schoolteachers incorporate oral health topics, in contrast a study conducted by Mota et al in India reported half of the teachers integrating oral health education[7]. The disparity between the two countries could be attributed to differing cultures and educational policies.

A significant oral helath related knowledge was reported among private school teachers, in contrast studies from India, Nigeria, and Uganda reporting limited knowledge[3,4,10], attributing to lack of comprehensive training and limited access to information.

In the current study, the most common teaching method employed by teachers was classroom lectures, visual aids and posters. However, a smaller proportion of teachers utilized services of dental health professionals, which is surprising given the effectiveness in other studies[4,2].

Almost 73.0% of teachers observed the supportive school environment, however, a study conducted in primary schools in Quetta reported unsupportive administration[5]. Similarly, a significant proportion of teachers (61.4%) from the current study reported the implementation of oral health education and awareness programs. This stands in stark contrast to another study conducted in Pakistan, where no such programs were reported by 71.02% of participants[1]. Nearly 42.1% of teachers believed their school's curriculum adequately addresses oral health, likewise, reported by studies done in Rawalpindi and India[1,4]. However, this perception differs notably from study conducted in Quetta, where oral health was not integrated in school curriculum[5]. Highlighting regional disparities in school policy implementation, and resource allocation.

A significant majority (94.9%) of respondents

Table 1: Incorporation of oral health topics teaching in relation to type of school

	Never %(n)	Daily	Weekly	Monthly	Occasionally	P value
Public	3.2%(2)	14.7%(9)	27.8%(17)	14.7%(9)	39.3%(24)	0.075
Private	4.4%(11)	22.8%(57)	21.2%(53)	26%(65)	25.6%(64)	

Table 2: Self-reported knowledge of various oral health related topics observed for relationship with type of school

	1 (very poor) % (n)	2 (Poor) % (n)	3 (Average) % (n)	4 (Good) % (n)	5 (Excellent) % (n)	P value
Cause and prevention of tooth decay						
Public	0% (0)	9.8% (6)	14.7% (9)	37.7%(23)	37.7% (23)	0.001
Private	10.4% (26)	16.4%(41)	17.2% (43)	12.8%(32)	43.2% (108)	
Role of nutrition in oral health						
Public	4.9% (3)	13.1% (8)	16.3% (10)	39.3%(24)	26.2% (16)	0.083
Private	4.8% (12)	16% (40)	16.8% (42)	22.4%(56)	40% (100)	
Importance of fluoride in oral care						
Public	6.5% (4)	21.3%(13)	37.7% (23)	16.3%(10)	18% (11)	0.004
Private	17.2% (43)	17.6%(44)	21.2% (53)	9.2% (23)	34% (85)	
Signs and symptoms of gum diseases						
Public	4.9% (3)	26.2%(16)	14.7% (9)	29.5%(18)	24.5% (15)	0.004
Private	12.4% (31)	13.2%(33)	26.8% (67)	16.8%(42)	30.8% (77)	
Impact of oral health on overall health						
Public	16.3% (10)	14.7% (9)	27.8% (17)	13.1% (8)	27.8% (17)	0.081
Private	16% (40)	13.6%(34)	16.8% (42)	8% (20)	45.6% (114)	

recognized the importance of oral health for children's overall health, aligning with findings from studies in Pakistan, India, Nigeria and China[1,7,10, 16].

The most significant barrier to oral health education was a lack of time and insufficient resources, identified in other studies as well[10,11,12], stressing the need for effective management strategies. Poor socioeconomic status is identified as a major factor for oral health disparity as reported by Oral health objective of United states, which is also reported by the current study[13].

A significant majority (97.1%) of respondents agreed that teachers should play an active role in promoting oral health in schools. Studies done in Kuwait and India also emphasized the importance of role of teachers[14,15] in contrast participants from another study believed that parents should solely bear the responsibility[1]. This suggests a need for a collaborative approach involving both teachers and parents to ensure comprehensive oral health education. School-based oral health interventions in China, Lagos and Brazil, have demonstrated positive outcomes[8,9,16].

This, highlights the role of teachers as facilitators for oral health education and underscores the need for capacity-building initiatives, such as targeted training and resource provision, to empower educators and maximize the effectiveness of school-based oral health interventions.

CONCLUSION

School is the ideal setting for oral health interventions. During this time behaviors are built and may indicate future health practices. Teachers should be well-equipped and informed to increase motivation and awareness among children regarding oral health.

However, findings from this study highlight significant gaps in teachers' self-reported knowledge, particularly regarding the importance of fluoride and the signs and symptoms of gum diseases. Addressing these gaps through targeted interventions, such as curriculum revisions and teacher training workshops, can enhance teachers' capacity to motivate and raise awareness among children about oral health.

LIMITATIONS

The study's limitations include its cross-sectional design, reliance on self-reported data, and limited sample size. Future research could address these limitations using mixed methods approaches and longitudinal studies to assess the impact of oral health education on student outcomes.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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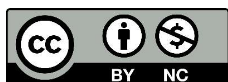
None declared.

AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	RS, AN, AH, PN, SURK
Acquisition, Analysis or Interpretation of Data:	RS, AN, AH, PN, SURK
Manuscript Writing & Approval:	RS, AN, AH, PN, SURK

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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