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Oral Health Knowledge and Practices Among Primary School Teachers in Mzuzu, Malawi

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Abstract

Background: School teachers can influence the oral health behavior of children since children spend most of their time at school. However, only a teacher with adequate oral health knowledge and practices can influence pupils' appropriate oral health care. Objective: To assess oral health knowledge and practices of the primary school teachers in Mzuzu city, Malawi. Methodology: This cross-sectional study was carried out among 382 primary school teachers, from 13 schools using a closed ended structured questionnaire. Results: Majority of teachers (81.9 %) and (91.7%) rightly indicated tooth decay is caused by bacteria and sugar respectively. Eighty-six percent and 84.3% of the teachers knew that brushing with fluoridated toothpaste and limiting sugar intake prevent dental caries respectively. Most teachers (92.7%) used toothbrushes and toothpaste for maintaining oral hygiene. About 63.6% of teachers brushed twice or more a day and only a few used dental floss. Regular dental visit was significantly associated with dental floss use (p=0.002) and with the knowledge that "gum disease is a bacterial infection" (p=0.0002). Over 98% reported to have received oral health education, however only 30% of teachers reported to have attended in service training for oral health education. Conclusion: The finding of this study is that schoolteachers had partial knowledge of oral health and their oral health practice was inadequate. Mass media was the major source (50%) of oral health information. This observation suggests that primary teachers need tailor made oral health education program and organized training to enhance their oral health knowledge and perfect their oral practices.

Keywords: Oral health, Knowledge, Practices, Source of information, School teachers.

INTRODUCTION

Oral health is essential to overall health and well-being [1]. The consequences of poor oral health are formation of plaque, calculus and bad breath which leads to gum diseases and dental caries that eventually affects the quality of life of an individual [2]. In children poor health mainly causes gum diseases and pain due to dental caries which affect the child's nutrition, growth, playing, poor self-esteem and school attendance. It is estimated that more that 50 million hours from school are lost annually due the conditions associated with oral diseases [2,3].

Oral health problems are major public health problems in Malawi [4] 34% and 95% of school children have dental caries and bleeding gums respectively .In districts like Mchinji, Nkhotakota and Ntchisi 54 % of children had dental caries and 65% gum diseases [4]. But, it was reported that majority of people had poor oral hygiene and the use fluoridated toothpaste was Infrequent [4]. Although the prevalence of caries is relatively low in Malawi at present, the changing living conditions due to urbanization and adoption of western lifestyle in Malawi, is considered as potential risk factors for the increase incidence of dental caries [5] such as increase consumption of sugary foods [4].

Dental caries and periodontal disease are preventable and lack of dental awareness among population is thought to be among the reasons for the higher prevalence of this diseases [6]. School is an excellent place for promoting oral health [7]. because the largest and the most important group of young population can be reached by health education [8] Furthermore, it is at school where children spend considerable amount of their time and thus the health behaviors can be gradually made accessible to them. These habits when acquired during childhood have shown to continue for their life time [9]. School teachers can play a key role in instilling oral health habits to their pupils.

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However, before teachers can influence their pupils in a positive manner with respect to oral health, it necessary for them to possess adequate knowledge, skills and motivation on oral health issues [10,11]. Previous studies have been done to evaluate the knowledge of school teachers on oral health, with a number of them showing adequate knowledge to oral health [12,13]. However, some studies have shown that teachers were not always able to adequately teach their students and the society about oral health due to their poor knowledge of oral health [14,16] Currently, teachers' knowledge and practices towards oral health in Malawi are unknown. Therefore, the purpose of the present study was to assess the oral health knowledge and practices and of primary school teachers in Mzuzu city, Malawi.

METHODOLOGY

This cross-sectional descriptive study was conducted among 385 teachers of Mzuzu city in Malawi to assess the oral health knowledge, practices and the source of oral health information. Mzuzu city has 43 primary schools with a total number of 800 qualified primary school teachers, of whom 617 are female. Simple random sampling procedure was executed to collect the representative sample. The sample size was calculated using $N= Z^2 \times P (1-P) / d^2$ where N= required sample size, Z1-a/2 = is the standard normal variant at 5% type 1 error ($p<0.05$) it is 1.96 and 1% type 1 error $p<0.01$) it is 2, 58). As the majority of attitude p values are considered significant below 0.05 hence 1.96 is used in the formula. p= is expected proportion in population based on previous studies or pilot studies = absolute error or precision - has to be decided by researcher. Since there was no prior study of this kind done in Malawi, a conservative estimate of p=50% was used. A total number sample sized required was 385 teachers. List of all public primary schools was obtained from the office of District Education Manager of Mzuzu city. Thirteen schools were randomly selected using random numbers once selected; the entire cluster of teachers present in the school during the survey period was used. Teachers who were absent on the day of the data collection were excluded from the study.

Objectives of the study were explained to the teachers that were present physically at school during data collection phase. Those who consented were included in the study. Data was collected using a close-ended self-administered questionnaire. The 30-item questionnaire consisted of four parts. The first part contained demographic information of the respondents. The second part assessed the oral health behavior including brushing activity (such as frequency, time, and brushing aids) and dental visits (such as regularity, last time of dental visit). The third part tested knowledge about causes and prevention of dental caries and gum diseases while the fourth part contained questions on the source of oral health education. The questionnaire was administered in English; however, sufficient explanation was given to any respondent who failed to understand the meaning of questions.

Approval to conduct the study was granted by Research Ethical Committee of Muhimbili Health and Allied Sciences, (MUHAS). It has also passed through the National Health Sciences Research Council of Malawi (NHSRCM) for approval and issuance of clearance certificates after ensuring that the study participants were protected from harm, respected and that the study process conforms to the scientific requirements. Thereafter, permission to carry out the study was obtained from all the selected school principals, and administrators before the visit to schools. The aim of the study was explained to the participants. Informed consent was obtained for the teachers. The filled questionnaires were gathered the same day the survey was conducted. Data obtained from questionnaires were entered into the computer spread sheets and analyzed using statistical package for social sciences.

Statistical Analysis

SPSS Version 16, (SPSS Inc., and Chicago, IL,USA) softawre was used for the analysis of the results. Results were presented as proportion for the categorical variables and as means ±SD for continuous variables. A chi-squire test was used to test the differences between two categorical variables. Statistically significant level was set at $P < 0.05$. T test was used to test the difference between the mean values of the continuous variable.

RESULTS

Socio-demographic characteristics

A total of 385 questionnaires were distributed among primary school teachers. Only 382 primary school teachers responded to the questioners representing 99% response rate from government schools only. Majority of the teachers (91.1%) were female. The mean age of the participants was 39.0± 9.1 years with age range of 20-60 years. The mean teaching experience of teachers was 14.7 ± 8.8 years. The highest educational qualification acquired by primary teachers in Malawi is certificate in teaching only which is obtained after 2 years of training.

Awareness of causes and prevention of dental caries

The majority of teacher's in the study about (81.9.7%) indicated that tooth decay was caused by bacteria while 91.7% of the teachers indicated that sugary foods cause dental caries, [Figure 1]. About 3.1% of teachers did not know the cause of caries [Figure 1]. Furthermore, 84.3% of schoolteachers knew that limiting sugar intake prevents dental caries and 86.6% of them answered correctly that brushing with fluoridated toothpaste prevents dental caries.

Teachers' awareness of causes and prevention of periodontal diseases

School teachers (76.2%) responded correctly that gum disease is an inflammatory response to toxins produced by a bacterial and 82.5% responded that bleeding gums is a common symptom of gum disease [Table 1]. Poor oral hygiene was considered to be associated with gum disease by more than 80% of the respondents. More than 87% of teachers responded correctly that gum diseases are preventable and 88% were aware that tooth brushing prevents periodontal disease. However, only 54% of the teachers knew that dental plaque is soft debris on teeth and is the cause of bleeding gums.

Teachers' oral health practices

In table 2, almost all (97.1%) teachers reported to use plastic toothbrush to clean their teeth while 92.7% of the teacher's used toothpaste as a cleaning material. Furthermore, 63.6% of the respondents reported to brush their teeth twice or more a day, 53.1% teachers dispensed the ideal amount of toothpaste i.e., less than half the length of tooth- brush. Changing of toothbrush once in every 3 months was practiced by 59.4% of the participants. About 51.6% of the teachers reported using toothpicks as oral cleaning aid. Concerning a visit to the dentist, majority of teachers (91.1%) agreed that regular dental visits were necessary, but only 20.9% of them responded that they had visited a dentist for routine check-up.

Association between socio demographic features, oral health knowledge and practices

There was no significant association between socio demographic characteristics of the teachers, oral health knowledge and practice. However, regular dental visit was significantly associated with dental floss use (p=0.002) but not toothbrush change once in 3 months (p=0.38). In addition, regular dental visit was also associated with knowledge that "gum disease is a bacterial infection" (p=0.0002), "dental plaque means soft debris on teeth (p=0.046) but not "limiting sugar intake prevents dental caries" (p= 0.14).

Source of oral health information

The majority of primary school teachers (98.2%) reported to have received oral health education. Of those who received oral health education, they indicated that major source was the mass-media (48%), school (36.3%). This percentage belongs to the long time ago compared to the current situation whereby oral health education has been included in the current curriculum of current pupils. Other sources of oral health information were dentist (9.6%), medical personnel (3.7%) and relative (2.4%). (Figure 2) Majority of respondents (80.4%) stated that they were aware that oral health education was included in school curriculum. Further, 59.7% of the teachers were involved in oral health education. Moreover, 30.3% of the teachers reported to have attended in service oral health education training while few teachers (20%) were upervised by dentist during oral health education lessons.

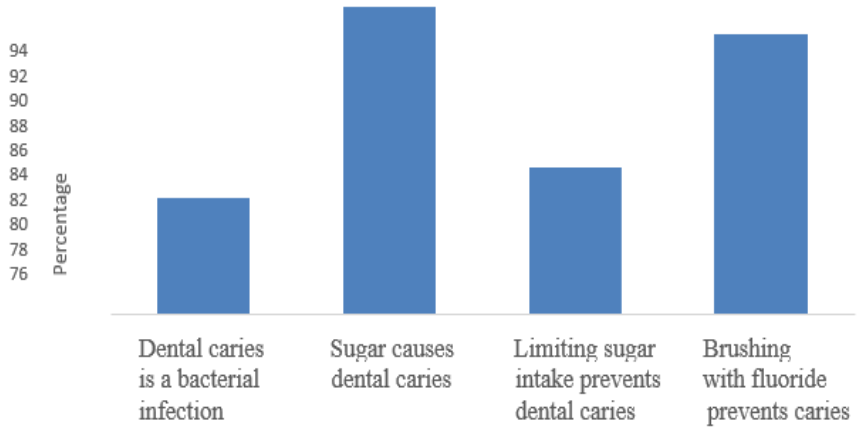

Figure 1: Percentages of school teachers who answered correctly on causes and prevention of dental caries (n = 382)

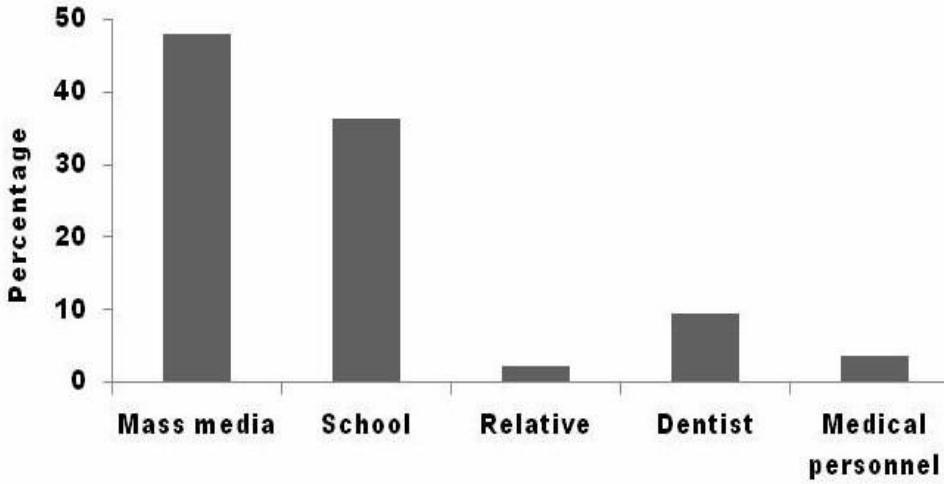

Figure 2: The distribution of various source of oral health information reported by teachers

Table 1: Percentages of schoolteachers who answered correctly on causes and prevention of periodontal diseases

Gum disease is a bacterial infection	291 (76.2%)
Dental plaque means soft debris on teeth	205 (53.7%)
Dental plaque causes swelling and bleeding of gums	265 (69.4%)
Bleeding gum is a common symptom of gum disease	315 (82.5%)
Gum diseases are preventable	334 (87.4%)
Brushing teeth prevents gum disease	337 (88.0%)

Table 2: Distribution of teachers by oral health practices

Number (%) (n = 382)

Mode of cleaning the teeth Plastic toothbrush Chewing stick Both	371 (97.1%) 8 (2.4%) 3 (0.8%)
Material used for cleaning the teeth. Toothpaste Salt Charcoal	355 (92.9%) 23 (6.0 %) 4 (1.0%)
Brushing frequency Once a day Twice or more a day	139 (36.4%) 243 (63.6%)
Time of cleaning the teeth	127 (33.2%)
Before/after breakfast Before going to bed Before/after breakfast+ before going to bed Any time	68 (17.8%) 37 (9.7%) 150 (39.3%)
Amount of toothpaste applied. Quarter of the toothbrush Half a toothbrush Full toothb**rush** I don't know	203 (53.1%) 84 (22.0%) 51 (13.4%) 17 (4.5%)
Frequency of toothbrush change After every 1-3 month After 4-6 month Until when it wears out	209 (54.7%) 59 (15.4%) 87 (22.8%)
Oral hygiene aids Toothpick Mouth rinses Dental floss toothpick + dental floss Nothing	197 (51.6%) 35 (9.2%) 27 (7.1%) 6 (1.6%) 119 (31.2%)
Regularity of dental visit Yes No	80 (20.9%) 302 (79.1%)
Last visit to a dentist ≥ 1 year ago < 1 year Never	138 (36.1%) 104 (27.2) 140 (36.6%)

DISCUSSION

The limitations of the study are that it depended on self-reported information which is often subject to response bias due to the different interpretations' individuals can give to the questions. This being a close ended self-administered study might have some limitations regarding the interpretation of the findings especially due to socially desirable responses. There was knowledge gap among the participants between the two common diseases which affected their response. This has been revealed on the results which showed that teachers were more knowledgeable on dental caries than periodontal.

This study assessed the oral health knowledge and practice of primary school teachers of Mzuzu City, in Malawi. To our knowledge, this is the first study to be done in Malawi regarding teachers' oral health knowledge and practice. Majority of the teachers in this study were females, in agreement with previous studies [17,19], this can be attributed to Malawian culture where teaching is regarded as a profession for females. This can have an effect on the results because most of the findings were based on females than men.

Most of teachers had a certificate in teaching practice as their qualification this is true in sub- Saharan African where teachers qualification range from under qualified to certificate in primary education, such as in Ethiopia, Kenya, Nigeria and Zambia .This is due to demand of primary school teachers required [20, 21]. This is different with primary school teachers in India where teachers had degrees as their highest qualification. This may be due to the different minimum education qualification for basic education for primary school teachers in different countries. India it's mandatory to have a degree in education in order to teach in higher primary schools [22]. Having a degree in a profession makes a person reason better and view things in different perspective. Different with person with certificate in terms of answering questions and tackling different life situation when encounter. Teachers had more experience in teaching practice of more than 15 years similar to the findings in India [23]. This was relevant because they had good experience in teaching.

The majority of teachers had adequate knowledge on causes and prevention of dental caries. The finding that high percentage of teachers knew that dental caries is a bacterial infection similar to a study in Pondicherry [23] but it contrasts to the study reported earlier [17] in Pakistan where teachers didn't have knowledge that caries is a caused by bacteria. Teachers also had knowledge that sugary foods are associated with tooth decay the finding which was also observed by Maranhãoet al in Brazil [19] but differs with finding from the study conducted in Nigeria [24] where teachers had low knowledge on cause of dental caries. High knowledge on dental caries among teachers in Mzuzu

may be attributed to increase in the dissemination of oral health messages during oral health week being done every year.

Teachers had partial knowledge on gum diseases. Although most teachers knew that gum disease is caused by bacteria, significant proportion of them lack the awareness regarding dental plaque and its association with bleeding gums, which is a common symptom of gum disease. The findings are in line with that of Ehizel et al [24], where teacher didn't know the etiological factors for gum bleeding. Furthermore, findings that high proportion of teachers responded that brushing prevent gum diseases and that poor oral hygiene was a risk factor for gum diseases, were in agreement to earlier reports [19,25].

Regarding the role of oral hygiene practice it is known that frequency of brushing can affect the effectiveness of tooth cleaning [24] and that tooth brushing at least twice daily for 2-3 minutes with gentle force it recommended for individual oral hygiene [25]. Teachers in this study had consistent oral hygiene practices, nearly two third of teachers were taking care of their oral cavity by brushing their teeth two or more times per day using plastic tooth similar to the studies reported in other countries [17,26]. Interestingly, when teachers were asked when they brushed their teeth was found that only about 10% brushed in the morning after breakfast and evening before going to bed while most of brushed before breakfast or anytime and a few before sleeping. This indicates that although the majority reported to brush twice or more, a relatively low number understood the importance of brushing before going to bed. Brushing before going to bed helps the tooth paste to remains in the Mouth because the salivary flow is reduced when a sleep [27].

Most of the participants reported the use of fluoridated toothpaste similar to Dikshit et al [28] but different from Dawan et al [17] reports. An interesting finding is that a good number of teachers who reported using fluoridated toothpaste, dispensed that was more than the recommended "less than half the length of toothbrush". This is not adequate as it may result in worse cases of fluorosis, especially in areas with high fluoride contenting drinking water. Only a pea-sized amount or smear of toothpaste should be used [27]. It is important for teachers to be able to correctly determine the concentration and amount of toothpaste they use so that they can transfer this knowledge to their children and community at large.

The use of dental floss and other interdental cleaners is important part of oral hygiene and is required daily to remove plaque and other particles between the teeth [29,30]. Flossing daily significantly reduces the interdentally plaque accumulation thus improve oral hygiene and reduce the incidence of periodontal diseases [31]. In the present study, the percentage of teachers who use dental floss and mouthwash for oral hygiene maintenance was very small and is similar to the finding from other previous studies [24,32]. Probably teachers were not a aware of these aids attributed to their irregular visit at the clinic. This has been indicated in the results, as the use of dental floss was significantly associated with regular dental visit. Hence majority of the teachers used potentially traumatic materials.

Therefore, it is recommended that an individual should visit the dentist for preventive care twice a year for routine checkup [27]. In the present study nearly two third of teachers reported to have previously visited a dentist, however, very few of them reported to visit a dentist for routine check-up, the finding similar to previous studies, [23,24] where the teachers only visited their dentist when they had dental pain. The high cost of dental treatment, very busy work schedule and limited number of oral health facilities that have been mentioned as the reason for the irregular dental visit elsewhere [24]. But this was not studied and thus can be an area of further research in Malawi.

Regarding oral health education information majority of teachers had received oral health information and aware that oral health education was included in the school curriculum. But only a few were involved in oral health education. Most teachers did not attend in-service training for oral health education and have never been supervised by a dentist. Similar to previous findings [23], where it was found that teachers did not have formal training in oral health education. Mass media was the common source of oral health information in this study. This is in contrast to the other findings in other studies [31] where a dentist was the common source of oral health information in Nigeria and Brazil respectively. This probably can be due to small number of dentists in Malawi in one hand and low number of dental attendances among patients.

CONCLUSION

Educators had good knowledge regarding etiology and prevention of tooth decay, but partial knowledge on the causes of gum diseases. The majority of participants report used toothbrushes to maintain good oral hygiene but demonstrated irregular dental visits. It is recommended that primary school teachers need well organized as well as tailor made oral health education programs and organized oral health education and training to enhance their oral health knowledge and practices.

Conflicts of Interest

The author reports no conflicts of interest.

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