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Oral health knowledge and practices among Dar es Salaam institutionalized former street children aged 7–16 years[1]

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Abstract: *Objectives:* To find out level of knowledge on causes and prevention of dental caries and bleeding gums, oral hygiene and eating practices among institutionalized former street children. *Methods:* A structured standardized questionnaire was used to collect data for this study. Chi-square test was used to test for significant differences. *Results and conclusions:* Eighty-eight per cent and 83% of the children knew the cause of tooth decay and bleeding gums respectively and 17–68% were aware of preventive measures. At the institutions visited, 92% of the children said they brush their teeth but 74% brushed when living on the streets, this difference was significant ($\chi^2 = 4.40$, $P = 0.05$). About half did not use toothpaste during street life, whilst 8% do not use toothpaste at institutions, the difference was significant ($\chi^2 = 5.081$, $P = 0.025$). Almost 22% use sweets and biscuits at institutions, about 44% used the snacks when living on the streets, the differences were significant ($\chi^2 = 3.798$, $P = 0.04$, and $\chi^2 = 3.893$, $P = 0.04$). Only 6% use sodas and sweetened juices at institutions, while 32–36% used the drinks during street life, the differences were significant ($\chi^2 = 4.38$ $P = 0.05$ and χ^2-12.87, $P = 0.01$).The findings of this study show that most former street children are aware of the causes of dental caries and bleeding gums but have poor knowledge on prevention of the two diseases. Furthermore, children living on the streets are more likely to eat cariogenic foods and have poor oral hygiene practices.

Key words: knowledge; oral health; oral hygiene practices; street children

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Introduction

Oral health practices like tooth brushing, use of fluoridated toothpaste, and minimal consumption of sugary foods can play a major role in prevention of oral diseases. However, this is only possible where a person understands the importance of dental/oral health (1). Timely access to current and relevant information is critical to the health and well being of any person. It is the basis for people to make informed decisions and choices about their health, thus ensuring good health and prevention of diseases at all levels (1). Health workers should provide health education to the general public. However, groups of people such as disadvantaged children are often denied access to health information and knowledge due to a number of reasons for example in-accessibility, nature of the disadvantage that may necessitate participation of specialized professionals.

Simply defined, disadvantaged children are those children who are physically, mentally or socially disadvantaged. For example, street children can be categorized as socially disadvantaged. The environment in which street children live and the associated lifestyles makes street children vulnerable to a wide range of health related and other problems including malnutrition, communicable and infectious disease, poor oral health such as dental caries and gingivitis, cognitive disorders and learning difficulties (2).

Studies on oral health knowledge and practices among street children are scarce. However, there are several studies on children's oral health. For example, Schuller *et al.* (3) in their study on children in Northern Canada show that girls know what constitutes good oral health. Similarly, King *et al.* (4) found that girls in Hong Kong children brushed their teeth frequently compared with boys. In Kenya, 9.2–12.4% of the peri-urban and urban children knew what causes dental caries. Despite this, there were no significant differences in oral hygiene habits and dental health care awareness between peri-urban and urban children (5). A study conducted in Ghana, indicated that a child's social class background is a significant predictor of levels of oral cleanliness and predictor of community periodontal index for treatment needs (CPITN) (6).

Furthermore, Al-Omiri *et al.* (7) and Otuyemi *et al.* (8) found that North Jordan and Nigeria school children had a high level of knowledge on oral health, whereas their counterparts in Jerash district Jordan, Tanzania and India did not know what causes oral diseases and how these can be prevented (9–11). Likewise, Al-Omiri *et al.* (7) found that approximately 69% of the children interviewed in North Jordan brush their teeth at least twice a day and approximately 83% use a toothbrush and toothpaste. In contrast, in China, Zhu *et al* (12) found that only 44.4% of the children brush their teeth and only 17% use fluoridated toothpaste.

In Tanzania, 72.5% of the children both in rural and urban areas said brushing their teeth with fluoridated toothpaste is important (10). Findings also revealed that most primary school children in Tanzania both urban and rural do not consume much sugary foods (10). By comparison the consumption of sugary foods and soft drinks among children in India was higher in urban areas than in rural areas (11).

Even though information about oral health knowledge and practices among the children in Tanzania is available, but very little is known about the level of knowledge on causes as well as prevention of dental caries and bleeding gums among disadvantaged groups particularly street children. This is the gap the current study sought to fill. Therefore, the purpose of this study was to determine knowledge levels on causes and prevention of dental caries and bleeding gums and to determine oral hygiene and eating practices among former street children aged 7–16 years old in Dar es Salaam.

Study population and methods

Study population

A total of 119 street children aged between 7 and 16 years old participated in this study. Of these, 81 (68%) were boys and 38 (32%) were girls. These were drawn from three of the six institutions which take care of street children in Dar es Salaam. The sample was predetermined using the following formula: $N = ZZPQ/EXE$, where $N =$ Sample size, $Z = 1.96$ corresponding to 95% confidence interval, $P =$ proportion of children who had knowledge of dental caries which is 90%, $Q = 100 - P$, $E =$ Estimated marginal error, set at 5%, (Table 1). No control group was incorporated.

Methodology

This was a cross-sectional study. It was conducted in Dar es Salaam city in Temeke, Ilala and Kinondoni municipalities.

Table 1. **Age and sex distribution of the study subjects**

	7–10 years, *n* (%)	11–13 years, *n* (%)	14–16 years, *n* (%)	Total, *n* (%)
Male	4 (3.4)	30 (25.2)	47 (39.5)	81 (68)
Female	14 (11.8)	19 (15.9)	5 (4.2)	38 (32)
Total	18 (15.2)	49 (41.1)	52 (43.7)	119 (100)

Ethical clearance to conduct this study was granted by The Muhimbili University College of Health Sciences (MUCHS) ethical committee under the category 'Elective studies for undergraduate students at MUCHS'. Permission to conduct this study was sought from the Executive Municipal Directors as well as from the institution authorities. All the children were informed about the aim of the study, and with assistance from their teachers they all gave their informed consent.

Data collection was done by means of a face to face interview conducted by one author (MHS) using structured standardized questionnaires which were translated in Kiswahili. The questions focused on finding out children's knowledge on causes and prevention of dental caries and bleeding gums and to determine children's current oral hygiene and eating practices. The children were also requested to recall and account for their oral hygiene and eating practices during the time they were living on the streets. Data was entered in a computer and analysed using an SPSS 10.0 software package (SPSS Inc., Chicago, IL, USA). Chi-square test was used to test for significant differences. A *P*-value of 0.05 was chosen as a level of significance.

Results

Findings reveal that 88% of the children knew the causes of tooth decay, specifically 67% said biscuits and 65% said sweets cause tooth decay. Only 36% and 32.8% knew that ice-cream and sweetened juice cause tooth decay, respectively. Similarly, 83% knew the cause of bleeding gums. In particular, 66% attributed bleeding gums to not brushing teeth and 64% to irregular tooth brushing. However, 89% did not know that ineffective tooth brushing cause bleeding gums (Table 2).

With respect to prevention, 83% of the children knew how to prevent tooth decay and 77% knew how to prevent bleeding gums. Similarly, 68% understood the importance of using fluoridated toothpaste. By contrast only 36% and 33% knew that they can prevent tooth decay by refraining from consuming ice cream and sweetened juice, respectively. In addition, 67% of the children knew that regular tooth brushing can prevent bleeding gums compared to only 17% who knew that proper tooth brushing can prevent bleeding gums (Table 3).

Regarding oral hygiene practices, 92% of the children claimed they brush their teeth now that they live in an institution compared with 74% who said they used to brush their teeth when they lived on the streets. This difference was statistically significant (Pearson $\chi^2 = 4.40$, $P = 0.05$). Fifty-one per cent of the children did not use toothpaste when they lived on the streets compared with 7.6% who currently live in the selected institutions (Table 4). This difference was significant (Pearson $\chi^2 = 5.081$, $P = 0.025$). One child said he/she uses traditional herbs to prevent oral diseases.

About 22% of the children who reside at the selected institutions consume sweets and biscuits compared with about 44% who consumed sweets and biscuits when they were living on the streets (Table 5). The differences were statistically significant (Pearson $\chi^2 = 3.893$, $P = 0.04$ and Pearson $\chi^2 = 3.798$ $P = 0.04$).

Six per cent of the children who live in the selected institutions drink sweetened juices and soda compared with 32–36% who did so when they lived on the streets. The differences

Table 2. **Percentage distribution of children's knowledge on foods that cause tooth decay and on causes of bleeding gums**

Causes of tooth decay and bleeding gums	Knowledge on food cariogenicity, *n* (%)	Knowledge on causes of bleeding gums, *n* (%)
Biscuits	80 (67.2)	–
Sweets	78 (65.5)	–
Ice-cream	43 (36.1)	–
Sweetened juice	39 (32.8)	–
Others	20 (16.8)	–
Abstaining from tooth brushing	–	79 (66.4)
Infrequent tooth brushing	–	76 (63.9)
Improper tooth brushing	–	13 (10.9)

Table 3. **Children's knowledge on prevention of dental caries and bleeding gums**

Preventive action	Knew the preventive action against dental caries, *n* (%)	Knew the preventive action against bleeding gums, *n* (%)
Use of fluoride toothpaste	81 (68)	–
Restricting use of biscuits	69 (58)	–
Restricting use of sweets	64 (54)	–
Restricting use of ice cream	43 (36)	–
Restricting use of sweetened juice/soda	39 (33)	–
Regular tooth brushing	–	80 (67)
Proper tooth brushing	–	20 (17)

Table 4. **Children's oral hygiene practices at institutions and while living on the streets**

	At institutions		While living on the street			
Oral hygiene practice	Yes, *n* (%)	No, *n* (%)	Yes, *n* (%)	No, *n* (%)	Pearson χ^2	*P*-value
Tooth brushing	110 (92.4)	9 (7.6)	88 (73.9)	31 (26.1)	4.40	0.05
Use of toothpaste	110 (92.4)	9 (7.6)	59 (49.6)	60 (51.4)	5.081	0.025

Table 5. **Sugary snacks consumed by children at institutions and while living on the streets**

	At institutions		While living on the street			
Consumed food	Yes, *n* (%)	No, *n* (%)	Yes, *n* (%)	No, *n* (%)	Pearson χ^2	*P*-value
Sweets	26 (21.8)	93 (78.2)	53 (44.5)	66 (55.5)	3.893	0.04
Biscuits	25 (21.0)	94 (79.0)	51 (42.9)	68 (57.1)	3.798	0.04
Soda	7 (5.9)	112 (94.1)	43 (36.1)	76 (63.9)	4.38	0.05
Sweetened juice	7 (5.9)	112 (94.1)	39 (32.8)	80 (67.2)	12.870	0.01
Cake	3 (2.5)	116 (96.5)	22 (18.5)	97 (81.5)	5.08	0.02

were statistically significant (Pearson $\chi^2 = 12.870$, $P = 0.01$ and Pearson $\chi^2 = 4.38$, $P = 0.05$, respectively). Cakes were eaten by 2.5% of the children residing in institutions and by 19% of those residing on the streets. The difference was significant (Pearson $\chi^2 = 5.08$, $P = 0.02$).

Discussion

Even though the sample size was slightly lower than the required minimum, however, since all 119 children were interviewed, it can be assumed that the results represent the views of other street children in Dar es Salaam. Information on children's oral hygiene and eating practices is based on their testimony and recollection of events from the time they lived on the streets. It is possible this study may be biased since it focused on street children but did not have a control group. As such the analysis is based only on the experiences of former street children. Additionally, the Hawthorne effect resulting from prior knowledge of the interviewees on our programme might have influenced the outcome of this study.

Respondents in this study were made up of 68% boys and 32% girls. This is a clear indication that there are more homeless boys who live on the streets compared with girls. This can be attributed to the fact that given the hardships of street life girls prefer to live with relatives or work as house maids for safety and security. In this study, there were very few children aged between 7 and 10 years. This is not surprising since at this tender age, children are still dependent on their parents and are not likely to leave the comfort and safety of their homes and opt to live on the streets.

A high percentage of the children studied (88%) knew the causes of tooth decay. Causal factors for tooth decay mentioned include sweets and biscuits. But a high proportion of the children did not know that sweetened juice and ice cream can also cause tooth decay. These findings are similar to those by Otuyemi *et al.* (8) in their study on Nigerian school children. Our findings are unlike those of Kaimenyi *et al.* (5), Nyandindi *et al.* (10) and Christensen *et al.* (11) who found that children were less knowledgeable about dental caries. Thus, in this study institutionalized children had a higher level of awareness than their counterparts, probably because before our visit they were given some oral health education by the authorities who had prior information about our programme. But, it is also possible that institutionalized children have access to information on health issues from various charity organisations, and are thus more informed compared with other children.

Findings also revealed that a large proportion of children in this study know that fluoride toothpaste does prevent tooth decay. This can also be attributed to the fact that these children probably received some health education on oral diseases prior to our visit. However, a high percentage of the children did not know that less consumption of sweetened juice and ice cream can help to prevent tooth decay. Exposure to oral health education is crucial and would allow children to understand cariogenic foods and drinks in their locality.

Unlike previous studies by El-Qaderi (9), Nyandindi (10) and Christensen (11), findings of this study revealed that a high proportion of the children in this study know what causes bleeding gums. The level of knowledge among children in this study on this issue is encouraging. Findings also revealed that, institutionalized children brushed their teeth with fluoridated toothpaste compared with their counterparts on the streets. For example, in this study, 92% of the children said they brush their teeth with fluoride toothpaste. These findings also corroborate those by Al-Omiri *et al.* (7) and Nyandindi *et al.* (10) who found that a majority of primary school children in North Jordan and rural as well as urban Tanzania brush their teeth regularly. By contrast, Zhu *et al.* (12) found that only 44.4% of the children brush their teeth and only 17% use fluoride toothpaste.

The fact that 51% of the respondents when they used to live on the streets and 8% of the institutionalized children in this study did not use toothpaste can be attributed to the fact that these children did not have access to toothpaste which also cost money. This also explains why a high percentage of street children (26%) and 8% of institutionalized children do not brush their teeth. These findings corroborate those by WHO (2) who report that street life and homelessness makes children more vulnerable to oral health problems.

A high proportion of children ate sugary snacks and sweetened juices when they lived on the streets than when they were institutionalized. It is possible that availability of food and security provided by these institutions may have resulted

in good eating habits. It is also true that street children have limited access to home cooked foods and therefore the only alternative available to them is cheap snacks and soft drinks.

Conclusions

The conclusions that can be drawn from this study are that ex-street children know what causes dental caries and bleeding gums but do not know some preventive measures for the two oral diseases. Besides, children who live on the streets are more likely to eat cariogenic foods and have poor oral hygiene practices.

Recommendations

Despite the fact that more street children are aware of the causes of oral diseases yet a good number of them do not know how to prevent such diseases. In view of this, it is recommended that health based NGOs and institutions which deal with street children should work closely together with health service providers in imparting oral education to these and other children either through workshops, TV, radio or performing arts. This is in line with what has been pointed out in the Ottawa charter for health promotion, that creating conducive environments for health makes healthier choices easier choices (13).

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