

## Factors Influencing Compliance with Oral Hygiene Practices Among Upper Primary School Children at Eldoret Town in Uasin Gishu County, Kenya

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### Abstract

Oral health is an important part of general health of body while poor oral hygiene can be a source of many diseases and especially among children. Compliance with practices enhances oral health, individual self esteem, social acceptability among the peers and general health. The practices that prevent and reduce oral diseases include tooth brushing; tooth flossing; use of fluoridated toothpaste for brushing and mouth rinsing and lower consumption of sugary foods and beverages. Regular dental visits are a practice that helps in early detection and prevention of dental diseases. Several factors influence compliance with oral hygiene practices among the children.

The study was done to investigate factors that influence compliance with oral hygiene practices among upper primary school children at Eldoret Town. First and foremost the study established the compliance of the children with oral hygiene practices. Specifically factors considered in this study were family and school characteristics.

The research design was a descriptive cross-section survey conducted in four primary schools in Eldoret Town of Uasin Gishu County, Kenya. The sample comprised three hundred and sixteen (316) upper primary school children.

Results showed that majority (70.3%) of the respondents brushed their teeth using toothbrush twice daily and 63.6% used fluoridated toothpaste. Only 24.3% used dental floss while 54.6% had never visited a dentist for check-ups in spite of having knowledge. There was a significant correlation between compliance with oral hygiene practices and family and school characteristics ( $r=0.425$ ,  $p<0.001$  and  $r=0.238$ ,  $p<0.001$ ) respectively.

The study concluded that children in upper primary school were compliant with tooth brushing using fluoridated toothpaste. However, they were non-compliant with the use of dental floss and going for dental check-up. The study also concluded that family characteristics (role models, motivation/encouragement, financial ability) and school characteristics (oral health curriculum, teachers trained in oral health, working school health team, safe environment with adequate water, free from unhealthy foods) influenced the compliance with oral hygiene practices of children.

**Keywords:** Oral hygiene; Oral hygiene practices; Oral diseases; Dental diseases; Dental visits; Compliance; Schoolchildren

### Introduction

Oral and dental hygiene is essential to good health in general and preventing occurrence of many diseases [1]. Dental caries and periodontal problems are due to poor oral hygiene practices [2-4]. According to Stone in 2010 dental caries presented a major problem for people in the developed countries, affecting 60-90% of schoolchildren compared to those in the developing countries. However, during the past few decades, the prevalence of dental caries has declined in many developed countries and the reverse is happening in the developing countries [5]. In many developing countries the severity in dental caries is increasing and has been associated with unhealthy dietary habits, limited use of fluoride and poor access to oral health services. The prevalence of dental caries was believed to be low

in Africa [6]. However, World Health Organisation (WHO) indicates that in the light of changing living conditions and dietary habits, the incidence of dental caries is increasing in many developing countries. The few studies done in Kenya have shown that 61-89% of the children have their teeth surfaces covered with plaque and gingivitis [7].

Harris et al, in 2004; Kasila et al, in 2006; Petersen et al, in 2008; and Chestnutt et al, in 1998 assert that maintaining good oral hygiene and using fluoride toothpaste for regular tooth brushing (twice a day) are essential in preventing dental caries and periodontal diseases. Compliance with these practices is influenced by a number of factors. According to Sufia et al, in 2009, a number of maternal factors have been suggested to influence child's oral hygiene practices. These include mother's age, her level of education, and her domicile of residence, cultural perceptions and the family's income. The personal characteristics that influence compliance in the children include self-esteem, motivation, knowledge/awareness, values and behaviour of the peers. Environmental factors on the other hand include mass media,

industries and community institutions [6]. A young person with high self-esteem and good social skills who is clear about her/his values and has access to relevant information is likely to make positive decisions about health. External factors have a tremendous impact on how adolescents think and behave; the values and behaviours of their peers are increasingly important while parents and other family members continue to be influential.

### Statement of the problem

Oral health standards are falling and the worldwide trend shows more tooth decay than before particularly in developing countries [8]. WHO, in 2005 has attributed this to the increasing consumption of sugars and inadequate of fluorides in tooth care.

Previous study findings indicate that the best way to avoid tooth decay and oral disease is through promotion of oral hygiene practices [9]. Thus regular tooth brushing using fluoride, mouth rinse with fluoride, dental flossing, and dental visits. These practices have been associated with reduction in dental decay. Furthermore compliance with the practices enhances individual self-esteem, social acceptability among the peers and general health [9].

In Kenya oral health education is integrated in the primary school programme from standard one through to standard four and it emphasizes on care of the teeth. Children are taught the various oral hygiene practices to enable them take care of their teeth. However, several factors influence children’s compliance with oral hygiene practices.

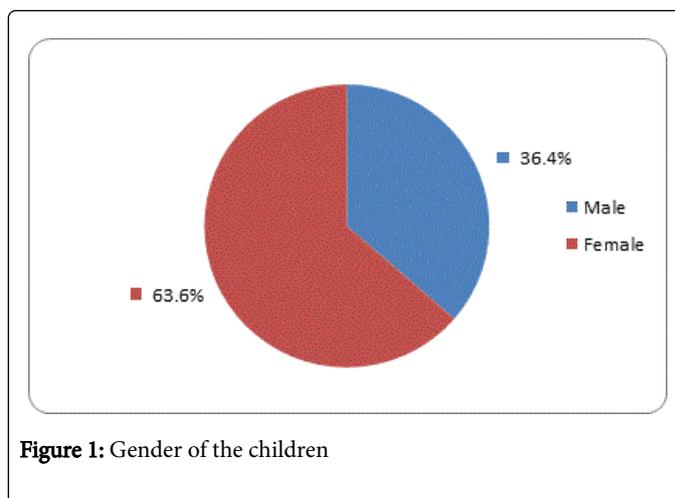
A recent study in Kenya showed that 53.6% (rural) and 68.1% (urban) of schoolchildren had dental caries [10]. Health records from the dental clinic at a public hospital in Uasin Gishu County in May 2009 showed that 250 children were treated. Twenty of the children required scaling while radiological examination was performed on ten (10). Of concern, 35% of the children required tooth extractions. Taking all these into account, the study aimed at investigating factors influencing compliance with oral hygiene practices among upper primary school children in Eldoret Town of Uasin Gishu County in Kenya.

### Research Methodology

A cross-section descriptive study carried out in 4 public primary schools of Eldoret Town in Uasin Gishu County. The four schools out of the sampling frame of 42 public primary schools were randomly selected to participate in the study. Upper primary school children (i.e. class five, six, seven and eight) were stratified into boys and girls. Representative proportion of boys and girls were randomly selected to participate in the study. The sample was comprised of 316 respondents. Self-administered questionnaires were used to obtain information from the respondent. Study data were analyzed using the Statistical Package for Social Sciences (SPSS-version 16).

### Results

Three hundred and sixteen upper primary school children participated in the study. They comprised of 201 (63.6%) females and 115 (36.3%) males (Figure 1).



**Figure 1:** Gender of the children

As shown in Table 1, the majority (70.3%) of the respondents reported brushing their teeth using tooth brush twice or more times daily. More than half (63.6%) used fluoridated tooth paste for brushing teeth while only 23.4% used dental floss twice or more times daily. Slightly more than half (51.4%) of the respondents had never used a mouth wash. Less than half (38.3%) of the respondents reported that they changed their tooth brushes at least twice yearly. Fifty four (54.6%) never visited a dentist for check-up.

Oral Hygiene practice	Once	Twice and more times	Never	Mean
I brush my teeth using tooth brush daily	81(25.6)	222(70.3)	13(4.1)	2.2
I brush my teeth using chewing stick	28(8.9)	91(28.8)	196(62.0)	3.3
I use fluoridated toothpaste for brushing my teeth daily	74(23.4)	201(63.6)	41(13)	2.3
I brush my teeth for over 2 minutes daily	66(21)	176(55.8)	73(23.2)	2.6
I rinse my mouth with water after brushing the teeth daily	112(35.6)	177(56.0)	26(8.3)	2.0
I remove food from the teeth using a dental floss daily	25(7.9)	74(23.4)	217(68.7)	3.4
I use tooth picks to remove food from between the teeth	94(29.7)	163(51.6)	59(18.7)	2.3
I use a mouth wash(special rinse) daily	44(14)	109(34.5)	162(51.4)	3.1
My tooth brush is changed yearly	139(44.1)	121(38.4)	55(17.4)	2.1
I visit a dentist yearly for regular check-up	51(16.1)	93(29.4)	172(54.6)	3.1

**Table 1:** Compliance with Oral Hygiene Practices

A significant proportion (85.1%) of the respondents were aware that brushing helped to prevent tooth decay, whereas 83.2% reported that tooth brushing prevented foul smell from the mouth. Seventy two point eight (72.8%) were aware that dental check-up every six month

was essential for oral health while 77.4% reported that tooth brushes should be changed every 3-4 months (Table 2).

Knowledge area	Aware	Not aware	Mean
Tooth brushing helps to prevent tooth decay	293(92.7)	23(7.2)	1.3
Tooth brushing removes bad smell from the mouth	285(90.2)	31(9.8)	1.3
Tooth brushing removes food from between the teeth	278(88.5)	36(11.5)	1.4
Using sharp objects in tooth cleaning damages/injures the gums	241(76.5)	74(23.5)	1.8
Sharing tooth brush may lead to spread of diseases	272(86.4)	43(13.7)	1.4
Visiting a dentist every six month is essential for oral health	273(86.4)	43(13.6)	1.5
The tooth brush is changed every 3-4 months	244(77.4)	71(22.5)	1.8
Excessive sugar and candy can cause tooth decay	284(89.8)	32(10.1)	1.3
Tooth brushing with fluoride toothpaste strengthen resistance of tooth surface	278(88.6)	36(11.5)	1.4
Proper amount of fluoride is helpful, but excess amount of fluoride may be harmful to health	219(69.5)	96(30.5)	2.0
During the dental check up the dentist may clean the teeth by removing food from between the teeth	227(72.1)	88(27.9)	1.9
Using sharp sticks and pins to remove food from between the teeth widens the space between them	188(59.7)	127(40.3)	2.3
The wide spaces in statement (3.12) above attract germs which can cause tooth decay	193(61.7)	120(38.3)	2.2
The problems related to mouth care are bad smell, bleeding gums, holes in the teeth and tooth decay	276(87.7)	39(12.4)	1.4

**Table 2:** Knowledge about Oral Hygiene Practices

On average, the family rarely supported the respondents with the oral hygiene practices (Table 3)

	Rarely	always	Never	Mean±SD
In my family every member brushes his/her teeth	233(73.8)	74(23.4)	9(2.8)	1.8 ± 1.0
My parents encourage us to keep our mouths clean for good oral health	256(81.2)	46(11.4)	13(4.1)	1.7 ± 1.1
My parents provide family members with tooth brushes, toothpaste,	219(69.2)	72(22.8)	24(7.6)	2.0 ± 1.3

My home has constant supply of water	217(68.9)	82(26)	16(5.1)	2.0 ± 1.2
My mother/guardian has provided us with containers to store our tooth brushes and toothpaste after use.	249(79)	40(12.7)	26(8.3)	1.8 ± 1.3
My parents remind us to brush our teeth after meals	225(71.5)	70(22.2)	20(6.3)	2.0 ± 1.2

**Table 3:** Family characteristics

Table 4 reveals that a majority (85.6%, 84.5%, 76.2%) of the respondents disagreed that their teachers inspect their mouth and teeth every morning, Wash basins are available in the ablution block to help us brush our teeth while at school, the health team checks their mouth and teeth respectively

	Agree	Disagree	Mean±SD
A team from the Health Centre visits our school regularly	153(48.4)	163(51.6)	2.6±1.3
The team teaches us how to take care of our mouth and teeth	187(59.2)	129(40.8)	2.2±1.4
The team also checks our mouth and teeth	75(23.7)	241(76.2)	3.3±1.1
The team cleans and treats children found with mouth and teeth problems	102(32.3)	214(67.7)	3.1±1.2
Care of the mouth and teeth is one of the topics we learn in science	283(90.4)	30(9.6)	1.3±0.8
Our teacher instructs us to brush our teeth every day	241(76.2)	74(23.5)	1.8±1.2
The teacher inspects our mouth and teeth every morning	45(14.4)	268(85.6)	3.6±0.9
The school canteen/tuck shop/vending trolley does not sell items like sweets, chocolate, juices, cakes	91(28.8)	225(71.2)	3.1±1.3
Our school has adequate water supply	138(44)	176(56.1)	2.7±1.3
Wash basins are available in the ablution block to help us brush our teeth while at school	49(15.5)	267(84.5)	3.5±1.0

**Table 4:** School characteristics

Comparison was made for compliance with oral hygiene practices of the children and the characteristics of their families, schools; and their knowledge on oral hygiene practices. There was a significant relationship between compliance with oral hygiene practices of children and the family characteristics and school characteristics ( $p < 0.001$ ). However there was no relationship between compliance with oral hygiene practices of the children and their knowledge of oral hygiene practices ( $p > 0.05$ ) (Table 5).

	Compliance with oral hygiene practices	Knowledge of Oral Hygiene Practices	Family characteristics	School characteristics
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Compliance with Oral Hygiene practices	Pearson Correlation	1	0.057	.425**	.238**
	Sig.(2-tailed)		0.313	0	0
	N	316	316	316	316
Knowledge of Oral Hygiene Practices	Pearson Correlation	0.057	1	.314**	.201**
	Sig.(2-tailed)	0.313		0	0
	N	316	316	316	316
Family characteristics	Pearson Correlation	.425**	.314**	1	.358**
	Sig.(2-tailed)	0	0		0
	N	316	316	316	316
School characteristics	Pearson Correlation	.238**	.201**	.358**	1
	Sig.(2-tailed)	0	0	0	
	N	316	316	316	316

**Table 5:** Relationship between compliance with oral hygiene practices and the independent variables, \*\*. Correlation is significant at the 0.01 level (2-tailed).

## Discussion

On average, the upper primary school children brushed their teeth twice daily using fluoridated toothpaste. However, the pupils rarely practiced dental flossing. Dental visits were done once yearly for check-up. These results were consistent with the results of a study by Kazemnejad et al, in 2008 which showed that about 71% of the students brushed teeth more than once a day. The findings were however, inconsistent with a study in Nigeria, in which tooth brushing was reported in 20% of schoolchildren in an urban area.

The use of fluoridated toothpaste was reported in the present study to be 87%. This was more than twice the level (38%) found among children of the same age group living in Beijing in 1993 [11] and 38.9% living a rural area of Uasin Gishu County [12]. The high rate of tooth brushing using fluoridated toothpaste may be explained by the easy availability of fluoride toothpaste and the parental role. Although the majority of the children used fluoridated toothpaste, 23.4% were not compliant with the recommendations for fluoridated toothpaste use while 13% did not use fluoridated toothpaste at all. This finding could be attributed to the high cost of the toothpaste among the low income families. Despite the availability in the market, toothpaste was inaccessible to some people because they could not afford the cost.

Dental floss usage was low among the upper primary children and which was similar to findings by Rise et al, in 1991 in which the use of the dental floss was rare among respondents in 22 European countries and Canada. In North Jordan, Al-Omiri et al, in 2006 recorded low use dental floss in their study. In contrast, Walsh in 1985 found that a high percentage of the sample they studied in the United States used the dental floss. The findings suggested the lack of knowledge on dental flossing and its value in preventing oral diseases. Dental floss could be expensive making it inaccessible to many people at the study sites compared to other regions.

It is of great concern that 54.6% of the respondents reported never visiting a dentist for check-up despite having adequate knowledge on the oral hygiene. Studies have shown that students visited a dentist in emergency situations only [13]. A study among Kenyan urban and

rural children by Kaimenyi et al, in 1993 revealed that children only visited a dentist for tooth extraction. The inability of the children to visit a dentist for regular check-ups could be associated with inaccessibility to dental services. According to Siringi, in 2002, Kenya allocates only US\$3680 of the health ministry's US\$0.23 billion budget to the dental health and there is only one public sector dentist per 378 000 people.

The study clearly indicated that the respondents were knowledgeable (86.4%) on oral hygiene practices. Similar findings were obtained by Liu et al, in 2007 in their study of children's knowledge on oral hygiene practices. However, a similar study in Kenya by Okemwa et al, in 2010 reported that children had low knowledge. The increased knowledge on oral hygiene practices in this study could be attributed to oral health education which has been integrated into the school curriculum. The mass media could also be playing a role in increasing the knowledge of children about oral hygiene practices.

A surprising finding in this study is that most respondents were aware of the importance of regular dental visits but were non-compliant with the practice. This could partly be explained by family income level and knowledge of the parents. According to a report by the National Oral Health Policy task force, there is inadequate funding for oral health in public health care. Furthermore, more than 80% of the country's dentists work in urban areas and take care of less than 10% of the population [14]. This situation therefore, discourages people from visiting a dentist unless they have a serious oral or dental problem.

## Conclusions

It is evident from the findings that children were compliant with oral hygiene practices in tooth brushing but were non-compliant with the use of dental floss, mouth wash (rinse) and dental check-ups.

The study also revealed that family characteristics (role models, motivation/encouragement, financial ability) and school characteristics (oral health curriculum, teachers trained in oral health, working school health team, safe environment with adequate water, free from

unhealthy foods) influenced the compliance with oral hygiene practices of children.

The Eldoret Town school children had good knowledge on oral hygiene practices but the knowledge did not increase their compliance with the oral hygiene practices.

## Recommendations

- Schools should provide suitable facilities such as safe and adequate water supply and wash basins to promote positive oral hygiene practices among school children.
- There is need for increased collaboration between schools and departments of oral health services to enhance compliance with oral hygiene practices among school children.
- The government should consider measures to provide affordable fluoridated toothpaste targeting school children from low income families.
- Teachers should be trained on basic skills in oral hygiene in order for them to appropriately implement the integrated oral health education content in the school curriculum.
- Further study should be carried out to determine the knowledge and practice of school children's parents on oral hygiene practices.

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