Parents' Knowledge, Attitude and Practice in Prevention of Dental Caries among Five-Year Old Children in Uasin-Gishu County, Kenya

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Abstract

Dental caries affect 60-90% of school-going children globally, and the prevalence is rising steadily in developing countries. Its impacts reduce the quality of life in children; compromise their nutrient intake, enjoyment of food, growth and sleeping patterns. The purpose of this study was to determine parents'/caregivers' knowledge, attitudes and practice behaviors regarding dental caries in 5-year old children. A cross-sectional study was conducted among 382 randomly sampled parents/caregivers who participated in the study using a self-administered questionnaire consisting of five items on knowledge, attitude and practices of dental hygiene related to prevention of dental caries. Dental caries assessment was carried out using the standard procedures described by World Health Organization. The data was analyzed using Statistical Package for Social Sciences version 21, 2014 (SPSS Inc., Chicago, IL, USA). Results showed that parents/caregivers have sufficient knowledge and a positive attitude towards oral health hygiene of the 5-year-old children. However, practices such as techniques of brushing teeth and reduction in the frequency of consumption of foods and snacks with refined sugar is not well implemented. In conclusion, parents'/caregiver's knowledge, attitude and practices related to their children's dental health is important in preventing dental caries. Therefore, more emphasis should be placed on educating the parents/caregivers on how to take care of their children's teeth and to strengthen proper technique of brushing teeth.

Keywords: Dental caries, Parents/caregivers, Children

INTRODUCTION

Dental caries is the most common chronic disease in childhood globally (Pawar *et al.,* 2018) and in most developing countries, the prevalence is rising steadily (Liu *et al.,* 2017). According to (World Health Organization (WHO) 2013), dental caries have a devastating impact on the nutritional, health and social wellbeing of children. In a recent review, Pflipsen and Zenchenko (2017) reported that dental caries reduce the quality of life in children, compromise their nutrient intake, enjoyment of food, growth and sleeping patterns.

Dental caries can be effectively prevented through proper oral hygiene measures that begin with the interaction of the knowledge, attitude and practices variables which are essential pillars in addressing dental caries. For instance, adequate knowledge about the dental hard tissues will result in a positive attitude towards routine check-ups and treatment, as well as regular practice of tooth brushing and interdental cleaning (Gurunathan *et al.,* 2018). Studies have shown that a direct link exists between mother's/caregiver's level of knowledge, attitude and practices to their children's dental caries status (Kawashita *et al.,* 2011; Mohammed & Gheena, 2015). The mother's attitude on oral health and her oral health

practices play a significant role in influencing their children's oral health status. Factors such as oral hygiene, diet, frequency of dental clinic visits, parent's anxiety/ nervousness, educational level and socio-economic status of mothers/caregivers and the child's outlook towards the dental visits influence the dental caries status of children (Reang & Bhattacharjya, 2014; Costa *et al.,* 2012).

In Kenya, the prevalence of dental caries among 5-year-old stands at 46.3% with a decayed, missing, filled teeth (dmft), which is a score that numerically express the caries prevalence and is obtained by calculating the number of decayed (d) missing (m) and filled (f) teeth (t), of 1.87 (Ministry of Health, 2015). A study by Kibosia (2011) among urban and rural pre-primary school children in Uasin-Gishu County of Western Kenya reported (dmft) scores of 1.97 and 3.30 for rural and urban children respectively, with over 90% of these dental caries in 5-year-old remaining untreated. However, there is limited knowledge on the influence of mother's oral health knowledge and practices on the dental health of their children in this County. Therefore, the aim of the study was to assess the level of dental caries knowledge, attitude, and related practices of parents/caretakers of 5-year-old children.

METHODOLOGY

Study design

A cross-sectional study was conducted in rural and urban areas of Uasin-Gishu County where 384 school children and their caregivers participated in the study. Data collection was done from May 2017 to June 2017 after obtaining informed consent from the caregivers who were willing to participate. Children who were 5 years ± 6 months and had no medical condition at the beginning of the study were included. In addition, parents who were the primary or registered caretakers in the school were included in the study.

Sampling and sample size

Purposive, multi-stage and simple random sampling techniques were used, and the sample size was calculated based on Fischer's formula (1997) (Araoye, 2003) getting a sample size of 354 with an attrition of 10% to arrive at 384 respondents. Of these, 382 completed the questionnaire at a 99.5% response rate.

Data collection

Knowledge, attitude and practices

A self-administered questionnaire written in English was used to collect data from the caregivers. The questionnaire was divided into three parts. Part A contained socio-demographic characteristics of the household where the 5-year-old belong. Part B had Questions on the knowledge and attitude of caregivers on prevention of dental caries and had 5 items with 4-point Likert scale for scoring (SD=Strongly Disagree; D=Disagree; A=Agree; SA=Strongly Agree). Section C had practice components where scoring was based on the frequency of implementation of the oral hygiene practices. Caregivers were asked to indicate if they implement those practices once a day, twice a day, sometimes a week or never. All aspects recommended for prevention of dental caries such as brushing of teeth, diet, and awareness of children's oral health were tested. Additionally, visiting a clinic for dental check-up was also addressed. Where language barrier exists, translation of the questionnaire into Kiswahili language that is understood by majority of the respondents was done by trained research assistant who were well-versed in the language.

Dental caries assessment

Oral examinations were performed by three fifth year students from the School of Dentistry, Moi University, Kenya who were calibrated by a paediatric dentist according to standard procedures described by World Health Organization (WHO, 2013). The examinations were performed in the school-room with children in a seated position on a school chair; the examiner sat in front of them. Cotton wool was used to dry the teeth, and natural day light was used for proper visibility. A Community Periodontal Index (CPI) ball-ended probe and a lighted mouth mirror were used as examination tools to score caries according to standard procedures described by World Health Organization (WHO, 2013).

Pilot study

Data collection tools used were piloted and pre-tested at the University of Eldoret Primary School Early Childhood Development and Education (ECDE) located in a peri-urban area.

Data analysis

The data was statistically analyzed and a p value of < 0.05 was considered significant.

RESULTS

Table 1 shows the socio-demographic characteristics of parents/caregivers of the 5-year-old in Uasin Gishu County. The response rate was 99.5% as 382 parents/caregivers completed the questionnaires. Most of the respondents (93.5%)were mothers, while only 6.5% were fathers. Almost half (43.9%) of the parents/caregivers had attained college/university education. Those who did not complete secondary education were 21%. With regard to occupation, the highest respondents (33%) were civil servants while farmers who grew crops such as maize, wheat and beans, kept cattle for food and sold the surplus were the least (16.6%) respondents.

Table 1: Socio-demographic characteristics of parents/caregivers of 5-year-old children in rural and urban areas of Uasin-Gishu County, Kenya

Variable	Description	N	Percentage (%)
Gender of parent/caregiver	Mothers	357	93.5
	Fathers	25	6.5
Level of education	Did not attain primary	12	3.1
	Attained primary	44	11.5
	Did not complete	80	20.9
	secondary	71	18.6
	Complete secondary	168	43.9
	University and college	7	1.80
	None		
Occupation	Farmer	63	16.6
	Civil servant	125	32.8
	Casual labourer	74	19.3
	Self-employed	104	27.1
	Other	16	4.2
Household income	<Ksh. 5000	23	6.0
	Ksh. 6,000-10,000	66	17.2
	Ksh. 11,000-20,000	75	19.6
	Ksh. 21,000-50,000	123	32.2

Knowledge

Knowledge on dietary habits and preventive measures for dental carries among parents/caregivers was assessed in this study (Table 2). Results showed that for the few (4.2%) who strongly disagreed that it is necessary to brush their children's teeth after breakfast and last thing at night, their children had the highest mean dft of 2.3±1.30, which was significantly different ($p<0.05$) from those who strongly agreed (37.2%), and had their children with very low mean dft of at 1.06±0.45.

Rinsing the mouth after meals is regarded as a good practice and hence important in reducing the occurrence of dental caries. In this study, a minimal number, 3.3% of parents/caregivers strongly disagreed that children should rinse their mouth after meals. Additionally, results showed that the children of such parents/caregivers had a higher mean dft 3.0±1.25, which was significantly different ($p<0.05$), compared to the 43.7% and 47% who strongly agreed, and had children with lower mean dfts of 1.12±0.35.

In this study, knowledge on consumption of foods and drinks with sugar and their influence on dental caries was also assessed. Again children of the few (9.3%) parents/caregivers who disagreed that food and drinks with sugar such as sweets, biscuits, and cakes affect children's teeth had a higher mean dft 1.61 ±0.45, than the 44.3% of parents/caregivers who agreed and had mean dft at 1.16±0.75, that was significantly different from those who agreed ($p<0.05$). The children of 39.2% of the parents/caregivers who strongly agreed had a mean dft of 1.54±0.08. Visiting dentists for dental check-up at least once a year is strongly recommended by the World Health Organization to reduce the severity and prevalence of dental caries. Results showed that children belonging to 6.3% of parents/caregivers who strongly disagreed that it was necessary for children to go for dental check-up at least once a year had a much higher mean dft of 2.29±0.25 which was significantly different from those who agreed that its necessary to go for a dental check-up ($p<0.05$).

Knowledge of the importance of brushing, flossing and avoiding sugar as a measure to reduce the risk of developing dental caries in children was also assessed. Parents/caregivers who strongly disagreed (8.1%) or disagreed (8.4%) that it is necessary to prevent dental caries in children by brushing, flossing and avoiding sugar had children with significantly higher mean dft of (1.93±0.36) and (2.02±1.08), respectively ($p<0.05$) than those who agreed (45.2%) and whose children had a mean dft of 1.46±0.56.

Table 2: Knowledge of dental health of parents/caregivers of 5-year-old children in urban and rural areas of Uasin-Gishu County

1Values are the means±Standard deviation; SD=Strongly Disagree; D=Disagree; A=Agree; SA=Strongly Agree

Aspects	Response	Percent (%)	dft[1]	OR (95% CI)
It is necessary to brush after breakfast and last thing at night	SD	4.2	2.3±1.30*	
	D	8.7	1.79±1.12	2.34
	A	49.4	1.18±0.82	
	SA	37.2	1.06 ±0.45	
It is necessary to rinse the children's mouth after each meal	SD	3.3	3.0 ±1.25*	0.86
	D	6.0	1.88 ±1.02	
	A	43.7	1.12 ±0.35	
	SA	47.0	1.5 ±0.05	
Food and drinks with sugar affect children's teeth	SD	7.2	1.41 ±0.36	1.33
	D	9.3	1.61 ±0.45*	
	A	44.3	1.16 ±0.75	
	SA	39.2	1.54 ±0.08	
A dental check-up at least once a year is necessary for children	SD	6.3	2.29 ±0.25*	1.66
	D	11.1	1.46 ±0.93	
	A	41.9	0.99 ±1.23	
	SA	40.7	1.34 ±0.22	
Brushing, flossing and avoiding sugar prevent dental caries in children	SD	8.1	1.93 ±0.36*	0.43
	D	8.4	2.02 ±1.08*	
	A	45.2	1.46 ±0.56	
	SA	38.3	1.47 ±0.76	

*Significant at $p<0.05$

Attitude

The attitude towards children's preventive measures of dental caries was assessed in this study (Table 3). Results showed that few (6.2%) of parents/caregivers who strongly disagreed that caring for the child's teeth is as important as caring for other parts of the body had children's mean dft 1.31±0.56. Those who agreed (39.2%) and 38.0% that strongly agreed had 1.41±0.34 and 1.53±0.62 mean dfts, respectively. Visiting a dental clinic for check-up at least twice a year is advocated to ensure healthy teeth. Children who had visited a dentist more than a year prior to this study (43.1%) had a mean dft of 1.53±0.65. Higher mean dft score of 1.57±1.23 was reported among children who had never visited the dental clinic preceding this study. This score was significantly different ($p<0.05$) from those who have visited a dentist in the last 7-12 months. Children who had visited a dentist because of painful teeth, 52.4% had a mean dft of 1.73±0.36 that was significantly different from those who visited the dentist because of check-up (mean dft 1.62) ($p<0.05$). Brushing after breakfast and before sleeping at night is recommended to dislodge food debris from the teeth. Those who strongly disagreed (6.6%) had higher mean dft of 2.19 ±1.08 that was significantly different ($p<0.05$) from those who agreed that brushing after breakfast and before sleeping at night (43%), and had their children with much lower mean dft score of 1.30 ±0.64. Those who disagreed that eating sweets and other high sugar foods affect teeth

(20%) had higher mean dft of 1.89 ±0.64 that was significantly different ($p<0.05$) from those who strongly agreed (mean dft 1.52 ±0.34).

Table 3: Dental health Attitude of parents/caregivers of 5-year-old children in urban and rural areas of Uasin-Gishu County

Questions	Response	Percent (%)	dft[1]	OR (95% CI)
Caring for the child's teeth is as important as caring for other body parts	SD	6.2	1.31 ±0.56	0.421
	D	16.6	0.95 ±0.37	
	A	39.2	1.41 ±0.34	
	SA	38.0	1.53 ±0.62	
The last time your child had a dental visit	0-6 months	12.0	1.50 ±0.54	0.210
	7-12 months	8.7	1.45 ±0.33	
	>1 year	43.1	1.53 ±0.65	
	Never	36.1	1.57 ±1.23*	
Reason for visiting the dentist	Painful tooth/treatment	52.4	1.73 ±0.36*	0.254
	Check-up/ Dental cleaning	47.6	1.62 ±0.06	
Brushing after breakfast and before sleeping at night is important	SD	6.6	2.19 ±1.08*	0.642
	D	11.1	1.63 ±0.64	
	A	43.1	1.30 ±0.64	
	SA	39.2	1.50 ±0.54	
Eating sweets, candies, cakes, biscuits affect your child's teeth	SD	8.1	1.57 ±0.47	2.13
	D	20.5	1.89 ±0.64*	
	A	38.3	1.62 ±0.56	
	SA	33.1	1.52 ±0.34	

1Values are the means±Standard deviation; SD=Strongly Disagree; D=Disagree; A=Agree; SA=Strongly Agree
*Significant at $p<0.05$

Practices

Practices that help to protect against dental caries were assessed in this study (Table 4). Results revealed that children who brushed twice a day (41.6%) had a very low mean dft 1.34±0.99, while a few 4.2% who never brushed their teeth had a higher mean dft of 1.79±0.74 that was significantly different ($p<0.05$) from those who at least brushed twice a day.

The practice of rinsing the mouth to remove food debris is advocated as a measure to reduce dental caries development. Children who never rinsed their mouth with water after meals (16.3%) had a high mean dft of 1.91±0.77 that was significantly different ($p<0.05$), from those who rinsed twice a day 34.3% and had a low mean dft of 1.45±0.09.

Brushing with fluoridated toothpaste is recommended to significantly reduce dental caries in children (Sheiham, 2001). In this study, children who used toothbrush and fluoride toothpaste for brushing twice a day 34.9% had low mean dft of 1.48±0.24 that was

significantly different ($p<0.05$) from those who never used a toothbrush and fluoridated toothpaste (7.2%) who had a mean dft of 2.25±0.89.

Brushing technique is critical in ensuring that debris is effectively removed from the mouth (Petersen, 2010). In this study, the children who brushed using "up-down and sideways" technique twice a day 38.9% had very low mean dft of 1.29±0.09 that was significantly different ($p<0.05$) from 13.9% who never brushed using correct technique and had a higher mean dft of 1.64±0.52.

Table 4: Oral hygiene practices among parents/caregivers of the children in urban and rural areas of Uasin-Gishu County

Questions	Response	Percent (%)	dft ±SD	OR (95% CI)
How often does your child brush their teeth	Once a day	21.4	1.58 ±0.83	2.07
	Twice a day	41.6	1.34 ±0.99	
	Sometimes a week	32.8	1.43 ±0.28	
	Never	4.2	1.79 ±0.74*	
The frequency of rinsing children's mouth after meals	Once a day	18.1	1.53 ±0.39	1.320
	Twice a day	34.3	1.45 ±0.09	
	Sometimes a week	31.3	1.55 ±0.25	
	Never	16.3	1.91 ±0.77*	
Using toothbrush & fluoride toothpaste for brushing	Once a day	21.7	1.67 ±0.67	0.724
	Twice a day	34.9	1.48 ±0.24	
	Sometimes a week	36.2	1.62 ±0.23	
	Never	7.2	2.25 ±0.89*	
Brushing children's teeth by "up-down and sideways" technique	Once a day	19.3	1.68 ±0.78	0.626
	Twice a day	38.9	1.29 ±0.09*	
	Sometimes a week	28.0	1.43 ±0.44	
	Never	13.9	1.64 ±0.52*	
The frequency of consumption of sugar-rich and sticky snacks	Once a day	24.4	1.53 ±0.35	1.890
	Twice a day	27.1	1.62 ±0.87*	
	Sometimes a week	32.2	1.50 ±027	
	Never	16.3	1.42 ±033	

*Significant at $p<0.05$

DISCUSSION

Caregiver's knowledge on the critical role of brushing teeth at least twice a day, attending a dental clinic at least once a year and avoiding sugar foods and drinks is necessary to prevent dental caries in children. From this study, parents/caregivers that had sufficient knowledge and strongly agreed that brushing of children's teeth is important (37%), their children had very low dental caries score (mean dft 1.06 ±0.45). On the contrary, those who disagreed that it is necessary to prevent dental caries in children by brushing, flossing and avoiding sugar (8%) their children had a high mean dft of 1.93±0.36. It is evident that good knowledge on ways of preventing dental caries is critical in lowering the prevalence of dental caries in children. Studies assessing the knowledge of the parents/caregivers in preventing dental caries reveal that majority of them are aware of the ways of preventing

dental caries in children, although few of them apply the knowledge while caring for their children's teeth (Gathecha *et al.,* 2012; MoH, 2015). This can also be seen in this study where parents/caregivers tend to visit the dentist with their children when dental caries has already become a problem instead of going for routine check-ups. Therefore, it is evident that the reasons for visiting a dentist were curative rather than preventive. This reveal limited knowledge among parents of the five-year-old children in preventing dental caries in their children.

Parent's/caregiver's attitude towards oral health influences their preparedness and ability to take measures to prevent dental caries in their children (Jepsen *et al.,* 2017). In this study, the attitude of the parents towards dental caries prevention was tested against their willingness to adhere to the recommended standards to ensure dental caries burden in children is lowered. For instance, the last time the children had a dental visit was low with those visiting a dentist in 0-6 months (12%) and another 9% visiting in the last one year. This low adherence to dental visit reveal that parents/caregivers are reluctant to voluntarily take their children for dental check-up even when they are free of caries. On the other hand, the reason for visiting the dentist show that more than half (52%) visit because of pain as a result of dental caries. A study by Kibosia (2011) found that children in both urban and rural areas of Uasin-Gishu County had high unmet dental caries treatment needs (over 90%) and this supports the finding that parents'/caregivers' attitude towards dental visits is still poor in the study area.

The importance of oral health practices such as tooth brushing in the removal of plaque, that plays a role in the initiation of dental caries, has been suggested (Ashkanani & Al-Sane, 2013). In this study, 21% of the children brushed their teeth once a day, 42% brushed twice a day while those who never brushed at all were 4.2% with mean dft score of 1.79. A higher percentage than in the present study was reported by Njoroge *et al*. (2007) where 63% and 31% of the children brushed once and twice daily. Elidrissi & Naidoo (2016) in a study among 3-5-year-old children in Khartoum reported a very high percentage of brushing where more than 83% of children brushed their teeth once a day. However, those brushing twice a day (15%) were lower than the 42% reported in this study. Despite the widespread practice of tooth brushing among the children in the current study, the level of dental caries was relatively high (dft=1.83). This finding could be attributed to the fact that 81% of the children used incorrect brushing technique with 19% brushing using the recommended "up-down and sideways" technique once a day. Further, the multifactorial etiology of caries may suggest that other factors such as sugar consumption and time for initiation of oral hygiene practices in children by the parents/caregivers might have played a role.

CONCLUSION

The study findings revealed that although parents/caregivers of 5-year-old children had good knowledge on how to prevent dental caries, their attitude and practices are still lacking in keeping up with the recommended standards.

RECOMMENDATION

Emphasis should be placed on the parents/caregivers for shaping their attitude and strengthening their oral health practices during oral health promotion for their children. Furthermore, awareness on the importance of visiting the dentist at least once in every six

months should be reinforced. Moreover, parents need to be trained on the recommended way of brushing teeth (up-down-sideways) and the use of fluoridated tooth-paste. For this purpose, more community health personnel need to be recruited to carry out community awareness programs and teachers to be trained in instilling these preventive measures in the children while in school.

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