Community Dent Oral Epidemiol 2004; 32: 447–55

Community Dentistry and Oral Epidemiology

Influence of perceived provider performance on satisfaction with oral health care among adolescents

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Okullo I, Åstrøm AN, Haugejorden O. Influence of perceived provider performance on satisfaction with oral health care among adolescents. Community Dent Oral Epidemiol 2004; 32: 447–55. © Blackwell Munksgaard, 2004

Abstract – Objective: To investigate satisfaction with dental care received at the last dental appointment among adolescents and to analyse factors influencing their satisfaction scores. *Method:* A total of 1146 subjects (mean age 15.8 years) attending secondary schools in Kampala (urban, $n = 591$) and Lira (rural, $n = 555$) completed structured questionnaires at school in 2001. *Results:* A total of 63% and 75% of Kampala and Lira students, respectively, reported attendance to dental clinics during the previous 2 years. The corresponding rates of students who confirmed satisfaction with oral health care services received were 73 and 77. In a logistic regression model, the students of Kampala who attended a dentist more than once, had no painful experience at the visit, evaluated their oral condition positively, were satisfied with the dentist's communication and dentist's information, were more likely to be satisfied with the oral health services received (OR = 1.7, 2.2, 4.1, 2.9 and 4.9, respectively). Regarding rural students, being satisfied with oral condition, dentist's communication and dentist's information were associated with higher odds of being satisfied with oral health care services (OR = 2.9, 1.9 and 2.3, respectively). *Conclusion:* Inter-personal interaction with the dentist is a key determinant in establishing satisfaction with dental care among urban as well as rural adolescents.

Key words: adolescents; oral health care; satisfaction; Uganda

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Submitted 21 October 2003;
accepted 17 May 2004

Introduction

Adolescence is a period of profound physical and psychological change during which young people start to assume control over their own lives and develop attitudes that determine their adult lifestyles (1). It is a period of change from parent-directed to self-directed use of oral health care services (2). With a population of approximately 25 million people, of whom 50% is below 14 years of age, and with an annual gross national product (GNP) per capita of USD 300, Uganda is one of the poorest countries in the world (3). Yet a decline in the health status of adolescents is expected over the next few decades because of increasing poverty and fewer opportunities for adequate education and employment (4). Access to and utilization of the oral health care services during this transition is therefore important to support the establishment of an oral health-promoting lifestyle that might be carried over into adulthood (2).

In order to plan for appropriate oral health care services among Ugandan adolescents, it is crucial to have information about their oral problems and how they use and perceive the oral health care delivery services available to them (5). Although evaluation of health care has traditionally focused

on medical records (5), increasing importance has been placed on the views of the patients for the process of monitoring and improving the quality of health services (5, 6). It is evident, for instance, that dissatisfaction with dentists affect patients' decision to return for more treatment (7–9). At the moment, there is little information about the extent to which African adolescents utilize the oral health care services, how they perceive the performance of the oral health care providers and how satisfied or dissatisfied they are with the services being provided (10). Apart from being few, studies that have examined satisfaction with health and oral health care delivery systems have involved mainly the adult population (11–13), despite the fact that adolescents' satisfaction with health care turns out to be quite different from that of many adults (14).

Patient satisfaction has been defined as a health care recipient's reaction to salient aspects of the context, process and result of their experience with health care services. This view characterizes patient satisfaction as an evaluation of directly received service, comparing the individual's health care experience with a subjective standard (15). The subjective standard used for judging a health care experience may be anyone or a combination of the following; (i) a subjective ideal, (ii) a subjective sense of what one desires, and (iii) a subjective average of past experience in a similar situation or some minimally acceptable level. Studies of adult patients conducted in developed countries have demonstrated a clear relationship among beliefs about oral health care providers, perceptions about provider behaviour and patient satisfaction (16, 17). In addition, evidence suggest that patient satisfaction with oral health care may also be influenced by other factors such as characteristics of the delivery system, outcome of care, sociodemographics and oral health status (7, 8, 16–18).

So far, no study has specifically examined satisfaction with oral health care among Ugandan adolescents. Feedback from adolescent patients and information about the factors influencing their satisfaction is imperative in the management of the oral health services at both the clinical and national level (18). This study, therefore, aimed to (i) study satisfaction with received oral health care as reported by urban and rural secondary school students in Uganda; (ii) study associations between overall satisfaction and background factors including perceived provider performance and contentment with own oral health condition.

Health care delivery system in Uganda

The provision of health care service is overseen by the Ministry of Health (MOH), the Ministry of Local Government (MOLG) and non-governmental organizations (NGOs) and is currently organized in four tiers; primary, secondary, tertiary and quaternary. The primary tier comprises health centres and lower units spread throughout the country. The secondary tier comprises networks of district and rural hospitals. The tertiary tier includes all general referral hospitals based at regional capitals. Two national referral hospitals (Mulago and Butabika) comprise the quaternary and highest level of health care. This arrangement is expected to improve on the accessibility to basic health services. Currently it is estimated that only 49% of the population live within 5 km of the nearest health facility (19). Uganda has a total of 160 dentists and the dentist to population ratio is 1 : 150 000. A majority of the dental professional staff work in governmental regional and district hospitals and in NGO hospitals. The lowest level in which oral health care services are provided is at the health centre IV facilities (county level), where at least a public health dental assistant is supposed to be based. Oral health services in rural, government-owned facilities are principally free of charge, whereas a user fee is being collected for hospital-based dental services in the main urban areas (19). The private sector is providing a substantial amount of the oral health care services in the urban settings, mainly in Kampala. The majority of the private and governmental dental clinics provide non-specialized preventive and curative services such as tooth extraction, scaling and polishing and restorative treatments on an outpatient basis. No health services are specifically designed for adolescents, who are expected to seek health care services in the same way as adults.

Methods

Study population and sampling procedure

The target population was students in Form I and Form IV attending public secondary schools in Kampala and Lira. Kampala, the capital city, accounts for nearly one half (41%) of all urban residents in Uganda. Lira district is typically rural and situated approximately 350 km north of Kampala. Although the proportion of the urban : rural population in Uganda is 1 : 5, approximately 80%

of all the secondary schools are located in urban areas. Thus, there was no strict justification for a proportional sampling of students from the two areas to reflect the urban : rural population ratio.

STATA statistical programme was used to estimate the minimum sample size, allowing for the design factor, the assumed risk behaviour proportion in the adolescent population, and the required precision. A total of 20 schools were listed in Lira and 10 considered for sampling, the inclusion criteria being public schools with at least 250 students and placed at least 10 km from Lira town centre. In Kampala, 30 schools within the radius of 10 km from the city centre (main Post Office Building) were considered for sampling. Using equal sampling fraction, a total of 10 secondary schools (five from Kampala and five from Lira) were then selected by simple random sampling. A total of 1324 students were invited to participate in the study of whom 1146 – 52% (591 students) urban, mean age 15.8 (±1.6, range 13–19) – response rate 87%, completed structured questionnaires at school. Absenteeism from school was the main reason for nonresponse. Written informed consent to participate in the study was obtained from the students' parents/guardians. Ethical clearance to conduct the study was granted from the Ethical Committee Norway (Regional komite for medisinsk forsknings etikk, Helseregion Vest), The Uganda National Council for Science and Technology, the local administration and schools authorities.

Survey instrument

The data were collected by confidential questionnaire in 2001. The questionnaire was designed and completed in English, the language of instruction in Ugandan secondary schools. The questions considering satisfaction with oral care and other oral health issues have been used previously among adolescents and adults in East Africa (11–13) as well as in other developing countries (20). The students completed the questionnaires in their respective classrooms under supervision by trained research assistants and in the absence of the teachers to ensure confidentiality. The survey instrument was reviewed for content validity by Ugandan researchers and pilot-tested before being used in the field. The questionnaire had 78 questions assessing sociodemographic characteristics and a number of variables related to perceived oral health status, satisfaction with oral health care services, use of oral health care services and other behaviours related to oral health.

Measures

Sociodemographic variables were categorical and assessed in terms of gender, age, place of residence where raised and parental education. *Frequency of use of oral health care services* was assessed by one item: 'How frequently have you attended a dental clinic during the previous 2 years?' Response categories ranged from 1 = once to 4 = more then three times. A dummy variable was constructed yielding 1 = attended once and 2 = attended more than once. Students were requested to reply to six questions pertaining to the oral health care received during their last visit at a dental clinic. For example 'Did you feel free to explain your problem to the dentist during your last visit at a dental clinic?' Answers were categorized as 1 = yes (agree), 0 = no (disagree)/uncertain (I do not know). Students indicated their *experience during their last dental appointment* as 1 = not at all painful and 0 = at least slightly painful. *Perceived oral health status and overall satisfaction with oral health care received at last dental appointment* were indicated on five-point Likert scales ranging from 1 = very satisfied to 5 = very dissatisfied. Responses to both questions were dichotomized yielding 1 = satisfied (including the original categories very satisfied and satisfied) and 0 = dissatisfied (including the original categories; neither satisfied nor dissatisfied, dissatisfied and very dissatisfied). This dichotomization was deemed appropriate owing to the skewed responses towards the satisfaction end.

Statistical analyses

The Statistical Package for Social Sciences (SPSS version 11.5) and STATA 8.0 were employed to analyse the data. Bivariate analyses were conducted using cross-tabulation and chi-square statistics. A principle component analysis (PCA) using Varimax procedure was performed to reduce six variables pertaining to aspects of oral health care services received at the last dental appointment to a set of maximally noncorrelated variables. Logistic regression and general linear models (GLM) (ANOVA) were employed for the multivariate analyses with overall dental care satisfaction as dependent variable in its dichotomized and nondichotomized forms, respectively. Statistics provided were adjusted odds ratios and mean scale scores with 95% confidence interval (CI). To correct for potential effects of the cluster sample design, logistic regression analyses were re-done with STATA (8.0) using the svylogit command. The

initial results provided by unadjusted analyses were left essentially unchanged. The significance level was 5%.

Drop-out analysis

A total of 357 (31%) of the students, who completed the questionnaire, were excluded from the multivariate analyses because they had not visited a dentist for any reason in the past 2 years. The latter analyses comprised 789 participants; 371 (63%) in Kampala and 418 (75%) in Lira. In Kampala, age, gender, parental education and perceived oral health of the students who reported no dental attendance in the past 2 years ($n = 220$) did not differ statistically significantly from that of the remaining students included in the multivariate analyses ($n = 371$). In Lira, the sociodemographic profile of the two groups differed only with respect to gender. Those who answered the questionnaire but did not attend a dentist in the past 2 years ($n = 137$) were more frequently males (79% versus 68%, $P < 0.05$) and were more likely to report satisfaction with oral health status (77% versus 68%, $P = 0.06$).

Results

Table 1 depicts the frequency distribution of all urban ($n = 591$) and rural ($n = 555$) study participants according to the main sociodemographic characteristics and oral health care related variables. Students from Kampala and Lira were differently composed with respect to gender, age and parental education as well as other explanatory oral health variables ($P < 0.001$). For this reason, and as disproportionate sampling of schools were employed in Lira and Kampala, all analyses were conducted separately for students from Lira and Kampala. As shown, 58% and 42% of the urban students and 60% and 40% of their counterparts in Lira confirmed dental attendance once and more than once in the past 2 years, respectively. Moreover, 73% of students in Kampala and 77% of their Lira counterparts reported being satisfied with the last dental appointment ($P < 0.05$). Corresponding rates regarding satisfaction with dental condition were 73% and 68%. Students from Kampala and Lira were different with respect to their experience of pain where 46% and 35% reported no painful experiences at the last dental appointment, respectively ($P < 0.001$).

Table 1. Frequency distribution (%) of study participants according to socio-demographic and oral health care related variables in Kampala and Lira

	Urban ($n = 371$) (%)	Rural ($n = 418$) (%)
Gender		
Male	185 (51)	275 (68)
Female	178 (49)	130 (32)**
Age group		
13–15	217 (59)	137 (33)
16–19	154 (42)	281 (67)**
Parents' education		
Low	76 (21)	145 (35)
Medium	74 (20)	166 (40)
High	215 (59)	105 (25)**
Overall satisfaction		
Satisfied	259 (73)	315 (77)
Unsatisfied	98 (28)	91 (22)
Dental attendance		
Once last 2 years	215 (58)	253 (60)
>Once last 2 years	156 (42)	165 (40)
Dental condition		
Satisfied	268 (73)	278 (68)
Unsatisfied	99 (27)	132 (32)
Last visit painful		
No	171 (46)	147 (35)
Yes	199 (54)	269 (65)*

*$P < 0.005$, **$P < 0.0001$.
The number of participants does not add to 789 because of missing responses to the various items.

Aspects of oral health care received at last dental appointment

Table 2 depicts the frequency distribution of adolescents' responses to 6 aspects of the oral health care provider performance. The characteristics most frequently addressed positively among urban adolescents were: felt free to explain problems (80%), got sufficient time to explain problems (73%) and sufficient information about problems (72%). The corresponding factors among rural adolescents were: clinician gave sufficient information about oral hygiene and gum disease (77%), felt free to explain problems (76%), and information about sugar and tooth decay (75%).

Dimensions of oral health care aspects received at last dental appointment

A PCA with the six original variables on perceived aspects of oral health care provided revealed two factors with eigenvalue >1. The two factor solution explained 66 and 67% of the variance among urban and rural residents, respectively. Among both urban and rural residents, factor 2 consisted of

Table 2. Adolescents' evaluation of provider performance at their last dental appointment

Quality aspects of provider performance	Urban ($n = 371$) (%)	Rural ($n = 418$) (%)
Free to explain problems	306 (80)	364 (76)
Sufficient time to explain problems	280 (73)	350 (72)
Sufficient information about problem	277 (72)	330 (68)
Information about sugar and tooth decay	265 (69)	367 (75)
Information about hygiene and gum disease	274 (71)	377 (77)
Information about preventive measures	252 (66)	378 (76)

Percentages of those who agreed or were satisfied with the aspects stated.

the following three items: 'received sufficient information about sugar and tooth decay', 'received sufficient information about gum disease' and 'received sufficient information about preventive measures generally', which all loaded highly (eigenvalue >2.5) on this factors. Those items were added into a sum score labelled 'information from dentist' (range 0–3).The remaining three items, 'felt free to explain own problems to the clinician', 'was provided enough time to explain own problems' and 'was provided sufficient information about own problems' loaded most highly (factor loading above 2.5) on the first factor. They were therefore added into a sum score labelled 'communication with dentist' (range 0–3). For use as independent variables in multivariate analyses, two dummy variables were constructed with the categories 0 = dissatisfied (including the original categories 0–2) and 1 = satisfied (including the original category 3).

Determinants of overall satisfaction with oral health care services received at last dental appointment

The proportion of urban students who were satisfied with oral health care services did not vary systematically with, age, gender and oral health knowledge. There was, however, a significant difference in satisfaction with oral health care services between urban adolescents having parents of low (57%), medium (59%) and high (72%) education ($\chi^2 = 9.6$, d.f. = 2, $P < 0.05$). The proportion of *urban* adolescents reporting satisfaction also varied significantly with dental attendance, pain experience and self-reported oral condition. Moreover, satisfaction varied systematically with dentist's communication and with dentist's information (Table 3). Age, gender and parental education entered step 1 explained only 3.2% of the variance in satisfaction (Nagelkerke's $R^2 = 0.032$, $\chi^2 = 6.7$, d.f. = 4, $P > 0.05$). Entering the oral health care indicators in step 2 raised the explained variance to 40% (Nagelkerke's $R^2 = 0.400$, $\chi^2 = 91.5$, $P < 0.001$).

Table 3. Factors associated with *urban* respondents' overall satisfaction with the oral health care services received during the last dental appointment

Variable	Group[a]	% satisfied	Adjusted OR[b] (95% CI)
Dental attendance			
At least once	140	68	1.0
More than once	119	79	1.7 (1.0–3.4)
Last visit painful			
Yes	126	65	1.0
No	137	79	2.2 (1.2–4.2)
Oral condition			
Bad	60	43	1.0
Good	262	74	4.1 (1.2–4.2)
Communication			
Dissatisfied	74	52	1.0
Satisfied	186	85	2.9 (1.6–5.5)
Information			
Dissatisfied	103	57	1.0
Satisfied	157	87	4.9 (2.6–9.8)

Multivariate analysis, $n = 371$.
[a]The total number in the different categories do not add up to 371 because of missing values.
[b]Adjusted for age, gender, parental education and oral knowledge.

Overall satisfaction did not vary systematically with gender, parental education and oral health knowledge among *rural* adolescents. Older students were more likely than younger ones to confirm satisfaction (13–15-year age group 67%, and 16–19-year age group 78%, $\chi^2 = 7.2$, d.f. = 1, $P < 0.05$). The proportion asserting satisfaction varied significantly with self-reported oral health status, dentist communication and dentist information (Table 4). Age, gender and parental education entered in step 1 explained 3.6% of the variance in overall satisfaction of rural students (Nagelkerke's $R^2 = 0.036$, $\chi^2 = 7.7$, d.f. = 4, $P > 0.05$). Entering the oral health care indicators in step 2 raised the explained variance to 19% (Nagelkerke's $R^2 = 0.190$, $\chi^2 = 34.2$, d.f. = 7, $P < 0.001$).

Table 4. Factors associated with *rural* respondents' overall satisfaction with the modern oral health care services provided during last visit

Variable	Group[a]	% satisfied	Adjusted OR[b] (95% CI)
Dental attendance			
At least once	193	79	1.0
More than once	122	76	0.9 (0.5–1.7)
Last visit painful			
Yes	203	76	1.0
No	125	79	1.2 (0.7–2.1)
Oral condition			
Bad	87	60	1.0
Good	274	80	2.9 (1.6–5.0)
Communication			
Dissatisfied	125	64	1.0
Satisfied	212	85	1.9 (1.2–3.5)
Information			
Dissatisfied	96	56	1.0
Satisfied	248	86	2.3 (1.4–4.2)

[a]The total number in the different categories did not add up to 418 because of missing values.
[b]Adjusted for age, gender, parental education and oral health knowledge.
Multivariate analysis, $n = 418$.

Results from the multiple logistic regression analyses were checked for potential influence of the method of scoring and the type of provider aspect that discriminated best between students most or least satisfied with oral care services. Data were re-analysed using GLM ANOVA with the six single aspects of received oral care as independent variables. After controlling for confounding effect of sociodemographics and oral health care variables, the mean satisfaction score varied systematically with the aspects of 'Felt free to explain problems' ($F = 4.1$, $P < 0.001$) and 'Received information about tooth decay' ($F = 13.6$, $P < 0.001$) among urban adolescents. Adolescents who felt free to explain problems and those who got information about tooth decay were more likely to be satisfied as compared with their counterparts who did not. Estimated marginal mean values and 95% confidence intervals (CI) for urban students were 2.4 (2.1–2.5) versus 2.7 (2.4–2.8) and 2.3 (2.1–2.5) versus 2.9 (2.6–3.0), respectively. Regarding the rural students, results from the between subject analysis revealed that the aspects 'received information about tooth decay' ($F = 4.1$, $P < 0.05$) and 'sufficient information about preventive measures generally' ($F = 4.9$, $P < 0.05$) discriminated statistically significantly between students being more or less satisfied with oral health care. Estimated marginal mean values and 95% CI were, 2.2 (2.0–2.4) versus 2.6 (2.4–2.0) and 2.2 (2.1–2.4) versus 2.6 (2.4–2.8), respectively.

Discussion

This study investigated satisfaction with oral health care services and its determinants among secondary school students in urban and rural areas of Uganda. Overall, 59% of the students investigated had visited a facility providing oral health care at least once during the previous 2 years. Considering that only 44% of the responding students reported having received dental treatment during the same period, one may speculate that at least some students attended only for a regular check-up (21). The attendance rate appears to be high; however, it is comparable with rates from studies carried out in neighbouring Tanzania that reported utilization rates of 43 and 52% in adult men and women, respectively, and a symptomatic attendance (i.e. because of toothache) rate of 56% in adolescents 11–20 years of age (12, 22). Similar rates have also been observed among university students in Hong Kong (10, 23). In a prospective study by Hawley et al. (24), 62% of English adolescents, 13–15 year of age, were found to maintain an asymptomatic pattern of attendance, i.e. attending for dental examination in the absence of symptoms.

Contrary to what has been reported previously from developing countries (10), students from rural Lira attended dental clinics as frequently as their urban counterparts in Kampala. As the dentist to population ratio is greater in urban than rural areas of Uganda, one would have expected the attendance rate to be the highest in Kampala. It should be noted, however, that Lira students were diagnosed with more serious dental caries than those of Kampala (25). Even more importantly, the public oral health service at Lira district hospital and at the health centres is still provided at no cost, whereas Kampala adolescents are subjected to a cost-sharing fee system for the public oral health care services or attend private dental clinics. The cost of health care services to an individual is an important barrier to the use of the health service that affects patient load (26, 27). Accordingly, Matee and Simon (28) reported a 33% reduction in the number of patients utilizing dental services after the introduction of the cost-sharing scheme in Tanzania. Consistently, the present study revealed that lacking money to pay for the oral health services was one of the most

important reasons given for not having attended a dentist during the previous 2 years among urban as well as among rural respondents (results not shown). It has been suggested that reasons such as 'perceiving no dental problems' reflect lack of oral health awareness and low priority given to oral health care (7, 8), suggesting that oral health professionals should look into ways of improving public dental awareness in order to promote regular dental attendance.

Adolescents participating in the present study contributed to the evaluation of the oral health care system, by assessing the performance of the care provider and by expressing their overall satisfaction or dissatisfaction with the care received. A high level of satisfaction was observed, with 73% of the urban and 77% of the rural respondents being satisfied with the oral health services provided. The present finding is consistent with those of previous studies of adults in sub-Saharan African countries and elsewhere (11, 15). The high level of overall satisfaction identified in this study, might be a result of reporting bias (29), in terms of respondents giving socially desirable answers or being reluctant to express negative opinions. In order to improve reliability and sensitivity, many authors recommend assessments of patient satisfaction using a multidimensional scale (30). Thus, the global measure of overall satisfaction using one item in the present assessment might not have been sensitive enough to determine differences in satisfaction scores, which might have contributed to the high rate of satisfaction observed. Moreover, recall biases might have affected responses as a relatively long recall period of 2 years was employed (29). Although the present study design has the potential for some type of information bias, the response rate of 87% was favourable. This might be attributed to the co-operation of the secondary school teachers who allowed the questionnaire to be distributed, completed and collected on the spot and in the presence of trained research assistants.

Comparing satisfaction with oral health care under different provision systems is an issue that has seldom appeared in the literature (18, 31). In this study, rural students expressed satisfaction more frequently than their urban counterparts, a disparity that did not remain statistically significant after adjusting for important confounding variables. Thus, the issue of cost sharing versus free care did not seem to influence satisfaction with the oral health care received. Nevertheless, the disparity observed between the rural and urban subjects could probably be explained by the fact that differences in professionally assessed oral health status were observed between students from Kampala and Lira. Whereas a larger proportion of students in Kampala than in Lira had dental caries, this gradient was the opposite when comparing urban and rural mean DMFT estimates (25). As shown in Table 2, substantial proportions of students asserted high-quality provider performance. Communication with and information from the oral health care provider contributed substantially to the explanation of students' overall satisfaction among urban as well as among the rural adolescents (see Tables 3 and 4, respectively). Previous studies have emphasized the significance of aspects of information given in fostering patient satisfaction with health care (7, 8, 15, 16). There is also evidence that the discrepancy between the ideal and actual behaviour of the oral health care provider as perceived by the patients fell mostly in the area of communication and information (32), indicating the relative importance of 'provider–patient relationship' factor in the provision of health care.

Contrary to findings reported by some studies and in accordance with the findings of others, age, gender and parental education had no significant explanatory value on satisfaction among the participants of this study (7, 8, 15). Perceived oral health status turned out to be an important predictor of satisfaction in the sample of students as a whole, whereas frequency of dental attendance and confirmed painful experience at the last dental visit impacted on the satisfaction score of Kampala students, only. This supports previous evidence indicating that higher level of satisfaction is associated with increased compliance, lower number of broken appointments and with decrease in perceived pain (15). In the study by Ntabaye et al. (11), perceived oral health status had a negligible explanatory influence on satisfaction, a finding that is in line with those of denture patients where the condition of the mouth was unrelated to the satisfaction scores provided by the patient (30). Different opinions exist, however, about the importance of professionally assessed dental condition on satisfaction with oral health care (31). In this study oral health condition was self-assessed with reasonable validity when the professional assessment is used as the gold standard (25).

In conclusion, despite the variation in the structure of the oral health care services provided in Kampala and Lira, urban and rural students

reported using oral health care facilities equally frequently and the majority was satisfied with the services received. Open communication about oral health issues between providers and adolescent patients during the dental visits might increase satisfaction with the oral health care received and even promote regular dental attendance among adolescents. Further research is needed to elucidate other important determinants of adolescents' satisfaction with the oral health care services. The question of whether adolescents' satisfaction with their health care actually influences their behaviour in terms of compliance with follow-up or clinical advice is also an issue for further research.

Acknowledgements

We are most grateful to the parents and the school authorities for allowing us to carry out this study. Thanks are also due to all secondary school students who participated in the oral health survey. Financial support from the University of Bergen and the Norwegian government is highly appreciated. We register our thanks to Makerere University for providing enabling conditions that led to the completion of this study. The assistance from Dr Fred Mboli of the Ministry of Health, Uganda and Dr Louis Muwazi of the Department of Dentistry, Makerere University is highly appreciated. We would also like to thank all those who in one way or the other contributed to the success of this study.

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