

Social and behavioral correlates of oral quality of life studied among university students in Tanzania

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This study applies an abbreviated version of the Oral Impacts on Daily Performances (OIDP) and the Life Satisfaction scale to oral-health-related quality of life (OHRQOL) and quality of life (QOL) among Tanzanian university students. The following questions were addressed: Are social and behavioral status associated with overall OIDP frequency scores? Do social and behavioral variables contribute to the explainable variance of the OIDP frequency scores beyond the effect of clinical indicators of oral disorders? Do OIDP frequency scores influence general QOL as measured by the Life Satisfaction scale? A two-wave cross-sectional study was conducted during the summer of 1999, involving 19–45-year-old students at the University of Dar es Salaam. One-thousand-one-hundred-and-twenty-three students completed self-administered questionnaires and 228 respondents were re-examined clinically after 4 weeks. The rates of tooth decay and tooth loss were 34% and 37%, respectively. Medical-non-medical status (OR = 2.7) self-perceived health status (OR = 2.7), and sugar avoidance (OR = 2.2) varied systematically with OIDP scores in multivariate analyses. Tooth decay and tooth loss alone contributed 10% to the explainable variance in the OIDP scores. Entering social and behavioral variables increased the explainable variance to 19%. Finally, life-satisfaction scores varied systematically and positively with the OIDP frequency scores in bi- and multivariate analyses. This study gives some indications that the social and behavioral contexts of Tanzanian university students are important in shaping their responses to oral disorders. □ *Oral-health-related quality of life; socio-demographic factors*

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Emerging consensus in the literature has identified three major dimensions of oral-health-related quality of life (OHRQOL); clinically assessed disease or impairments, disease and treatment specific symptoms, and functional disability (1). OHRQOL also includes self-perceived oral condition and satisfaction with dental appearance (2, 3). In turn, biological variables and their functional and psychosocial consequences are linked to overall well-being and quality of life (QOL), as suggested by contemporary conceptual models (2–4). This study applies an abbreviated version of the Oral Impacts on Daily Performances (OIDP) inventory (3, 4) and the Life Satisfaction scale (5) to research on OHRQOL and QOL, respectively. The OIDP and the Life Satisfaction scales were chosen because both indices are relatively short and thus less time-consuming when applied in large-scale population surveys.

A previous study of university students in Tanzania has provided evidence of acceptable psychometric properties of the OIDP frequency scores in terms of reliability and validity (6), indicating that this measure might be appropriate for use in cross-sectional surveys with the aim of discriminating between groups. One contentious finding was the relatively weak relationship between the overall OIDP frequency scores and a clinical sum-score of tooth loss, tooth decay, discolored teeth, and supragingival calculus. Numerous studies have identified a gap between professionally and self-defined oral health (7–10),

suggesting that they document different dimensions of human experience, which are conceptually and often empirically distinct and have different implications for treatment need (11). Following the propositions implicit in the theoretical discussion of OHRQOL (12–14), the link between clinical and subjective indicators is not a direct one, but mediated by socially and culturally derived values, expectations, and preferences and by material, social, and psychological resources.

Social inequalities have been observed with respect to self-perceived as well as clinical oral health status (15, 16). Gilbert (15) noted that higher proportions of South African people who spoke a 'black' language reported poorer self-assessment of oral health than their 'white language' counterparts. Studies in industrialized countries have shown that individuals belonging to higher income groups are, respectively, less and more likely to report pain and to be satisfied with their oral health status than are their lower socio-economic counterparts (17, 18). Higher levels of education have been associated with more but also with less self-reported oral pain (19, 20). As compared to urban residents and individuals asserting good health condition, rural residents and those who perceive their health condition as poor report dental symptoms more frequently (4). Mixed support has been provided for the presence of age and gender differences. Some studies show absence of significant relationships, some suggest that

Table 1. Social and behavioral characteristics of study subjects ($n = 1123$). Number of students in parentheses

	Males % (<i>n</i>)	Females % (<i>n</i>)	All % (<i>n</i>)
Age range ≤ 25 years	45 (336)	72 (257)	54 (593)
Medical subjects	53 (399)	65 (236)	57 (635)
Raised in urban area	61 (463)	81 (288)	68 (751)
Rating general health as poor	19 (146)	14 (49)	17 (195)
Rating oral health as poor	31 (234)	40 (145)	34 (379)
Rating dental appearance as dissatisfactory	33 (245)	41 (149)	35 (394)
Dental attendance less than once a year	77 (587)	57 (204)	71 (791)
No sugar avoidance	44 (333)	42 (151)	43 (484)

females and younger subjects are most likely to rate their oral health unfavorably, whereas others have found that gender differences in self-assessed oral health vary across countries (20). It is evident that people who have good oral hygiene habits and are regular dental attendees tend to be more satisfied with their oral health status, whereas smokers report dental symptoms more frequently than non-smokers (20, 21). On the other hand, Cushing et al. (7) found no difference in perceived oral health status between regular and non-regular dental attendees.

The evidence with respect to socio-economic correlates of OHRQOL, notwithstanding, an important caveat is that this developing field of research is based almost entirely on studies conducted in industrialized countries. Thus, the empirical evidence obtained might be less meaningful or at best questionable in non-occidental contexts. Cohen & Jago (20) have argued that dentistry contributes greatly to the improvement of QOL through the prevention and treatment of oral diseases. Few studies have examined whether OHRQOL influences QOL to any appreciable degree.

Using data from an oral health survey conducted among Tanzanian university students, this study addressed the following research questions: Is social and behavioral status associated with overall OIDP frequency scores? Do social and behavioral variables contribute to the explainable variance of the OIDP frequency scores beyond the effect of clinical indicators of oral disorders? Do OHRQOL in terms of OIDP frequency scores influence QOL as measured by the Life Satisfaction scale?

Materials and methods

A two-wave cross-sectional study was conducted during the summer of 1999, involving 19–45-year-old students enrolled at the University of Dar es Salaam (UDSM), the Dar es Salaam Technical Institute (DIT), and the College of Business Education. Constituting a homogeneous socially affluent group of the Tanzanian adult population, students of higher education institutions are among those most likely to be exposed to dental services and to mass media oral health education programs. For this reason and also in order to ensure literacy, university students were selected purposively for this study. In 1999, the UDSM, the largest public government recognized university in Tanza-

nia, had a total enrolment of about 5100 students, of which 21.5% were females. At the time of the survey, only 4 faculties (Education, Medicine, Pharmacy, Dentistry) and three institutes (Allied Health Sciences, DIT, and CBE) were eligible for study because most institutions of higher education in Dar es Salaam were busy with examinations. All students ($n = 1920$) enrolled were invited to participate. A total of 1123 subjects (females 32%) completed structured questionnaires in English, administered in ordinary classroom settings and supervised by trained Tanzanian research staff (Table 1). The survey instrument was adapted from that developed by the Tanzanian adult morbidity and mortality project (22), and from survey instruments previously tested in Tanzania (23). It contained information on different subjective oral health indicators, including the 8-item OIDP frequency inventory (3, 4). Students' interpretation as to how the oral condition may add to or reduce QOL was explored through qualitative research questions in a separate study to ensure the content validity and cultural appropriateness of the OIDP frequency inventory (6). Informed consent was requested from each participant and ethical clearance was obtained from the research and ethics committee at the UDSM.

A follow-up study was conducted after 4 weeks, involving 350 students, sampled in a systematic, random way from the list of the respondents of the questionnaire survey. A total of 228 students (response rate 65%) completed a short questionnaire and took part in a brief clinical examination. A Tanzanian dentist, trained according to the criteria for diagnosis given by the World Health Organization (24), undertook the clinical examination, with participants sitting on an office chair in an upright position facing the window. An assistant recorded the scores. Natural light was the source of illumination and a dental mirror, gloves, and cotton pads the only aids for inspection of the mouth and teeth. No radiograph was taken, probing was not employed, and calculus was not removed prior to the examination. A tooth was considered decayed when a lesion in a pit or fissure or on a smooth tooth surface had an unmistakable cavity or undermined enamel easily visible by eye (24). A tooth was considered missing due to caries if the respondent gave a history of pain and/or the presence of a cavity prior to extraction. The presence [1] or absence [0] of visible tooth decay and missing teeth was registered.

Measures

Oral impacts on daily performances. Eight measures reflecting physical, social, and psychological aspects of daily performances were utilized (3, 4). In its original form, the OIDP scores are calculated by multiplying frequency and severity scores of performances. It has been suggested, however, that either the frequency or the severity scores can be used for the reason of simplicity and efficiency (3). Thus, the 8 OIDP frequency items were assessed and responses were recorded on a scale in the range [1] 'affected less than once a month or never' to [5] 'every or nearly every day' (Table 2). For the purpose of cross-tabulation analysis, each item was dichotomized yielding the categories [0] 'affected less than once a month or never' and [1] 'perceived impacts at least once or twice a month' (including the original categories 2, 3, 4, and 5). Simple count scores (SC) were created for the OIDP frequency scale by adding the 8 dummy variables (mean number of performance affected 1.2, $s = 1.8$, range 0–8). Additive scores (ADD) were created by adding the 8 OIDP items as assessed originally (mean = 10.4, $s = 4.5$, range 8–41). The SC OIDP frequency scores (0–8) were dichotomized, yielding the categories [0] 'no daily performance affected' and [1] 'at least one daily performance affected'. Proportions of missing cases were less or equal to 8.6% and 10% for 5 and 3 of the OIDP items, respectively.

Perceived general health status was assessed by one question: 'How do you consider your general health status?' Response scale [1] 'excellent' to [5] 'very poor'. A binary variable was constructed yielding [1] 'good' (including the original categories 1 and 2) and [2] 'poor', and used as validating criterion.

Perceived oral health condition was measured by one item: 'How do you consider the present condition of your mouth and teeth' using 5-point scales ranging from [1] 'excellent' to [5] 'very poor'.

Satisfaction with dental appearance was assessed by one item, i.e. 'Are you satisfied or dissatisfied with the appearance of your teeth?' A 5-point response scale was used ranging from [1] 'very satisfied' to [5] 'very dissatisfied'.

Quality of life was measured using the 5-item Life Satisfaction scale (6). Responses were given on a scale ranging from [1] 'strongly agree' to [5] 'strongly disagree'. Students were requested to respond to items such as 'In most ways my life is close to my ideal'. A sum index was constructed by adding the 5 items (mean = 13.7, $s = 3.8$, range 5–25). The lower the score on this index the higher the level of life satisfaction.

Socio-demographic characteristics were assessed in terms of gender: [0] 'male' and [1] 'female'; place of residence was raised: [0] 'city or town' (urban) and [1] 'village/rural area' and students status: [0] 'medical subject' and [1] 'non-medical subject'. Age was assessed as age at last birthday. A dummy variable was constructed yielding the categories [0] '≤25 years' and [2] '>25 years'.

Dental attendance was assessed by one question:

'During the last 3 years, how often have you visited a dentist?' Response categories were [1] 'twice a year', [2] 'once a year', [3] 'seldom', [4] 'never'. Avoidance of sugared snacks and drinks was assessed by one question: 'Have you ever tried to avoid between-meal-intake of sugared snacks and drinks?' Response categories [0] 'yes' and [1] 'no'. Students' interpretation of the term 'sugared snacks and drinks' in terms of sugared tea/coffee, soda, chocolate, sweets, ice cream, cakes/biscuits, sugar sweetened fruits, and sweet desserts was confirmed in separate interviews with the participants.

Statistical analyses

Non-parametric tests in terms of Mann-Whitney U-test and the Kruskal-Wallis test were used in bivariate analyses. Parametric tests in terms of an independent sample *t*-test and ANOVA were applied with the OIDP frequency scores after log transformation, since the subjects were non-normally distributed according to this scale. Multivariate analyses of variance (GLM) were carried out with the 8 OIDP frequency scores as dependent variables to identify the single OIDP items which discriminated most clearly between groups defined in terms of socio-economic and behavioral variables. Multivariate analyses with the OIDP and life satisfaction scores as dependent variables were performed using logistic and linear regression analysis, respectively.

Results

Socio-demographic and behavioral characteristics

Table 1 gives the percentage distribution of participants' socio-demographic and behavioral characteristics. Male students dominated both in the main (68%) and the follow-up study (56%). The majority of females, 72%, were in the age range 19–25 years old, whereas the majority of the male students belonged to the age group above 25 years ($P < 0.001$). Significantly higher proportions of females than males were medical students and raised in urban areas ($P < 0.001$).

Reliability of questionnaire variables

A retest of the whole survey instrument was undertaken among 33 participants after a time interval of 33 days. The test-retest reliability coefficient (Spearman's rho) of the OIDP ADD scores and the Life Satisfaction scores were 0.87 and 0.92, respectively. Internal consistency in terms of Cronbach's alpha (25) of the OIDP ADD scores was 0.83 and 0.87 on the first and second administration of the questionnaire, respectively. Corresponding figures for the Life Satisfaction scale were 0.73 and 0.74. OIDP item numbers 1, 4, 5, 6, and 7 (for the wording of the single OIDP items, see Table 2) had satisfactory kappa values

Table 2. The content and scoring of the 8 performances items included in the OIDP

During the past 6 months, how often have problems with your mouth and teeth caused you any difficulty with:

1. Eating and enjoying food
2. Speaking and pronouncing clearly
3. Cleaning teeth
4. Sleeping and relaxing
5. Smiling, laughing, and showing teeth without embarrassment
6. Maintaining usual emotional state without being irritable
7. Carrying out major work and social role
8. Enjoying contact with people

Response format: (1) affected less than once a month/never, (2) once or twice a month, (3) once or twice a week, (4) 3–4 times a week, (5) every or nearly every day.

and 95% confidence intervals (95% CI) at respectively, 0.59 (0.23–0.96), 1.00 (1.0–1.0), 0.64 (0.02–1.27), 1.00 (1.0–1.0), and 0.64 (0.00–1.28). Item numbers 3 and 8 had kappa values at less satisfactory levels 0.22 and 0.08, respectively, whereas the kappa value for item number 2 was not computable (6).

OIDP scores

The proportion of students who reported impacts on daily activities at least once or twice a month declined across the OIDP frequency items from 40% concerning item number 1 to 10% regarding item numbers 2 and 8. A total of 49% had OIDP scores of zero using both the ADD and the SC methods. The ceiling effects (proportions of students scoring maximum) were 0.1% and 1.8% using the ADD and SC methods, respectively. Thus, a total of 51% of the students reported that an oral problem of some sort had affected them on at least one daily performance in the 6 months preceding the survey.

Clinical and non-clinical correlates of OIDP

The rates of tooth decay and tooth loss were 34% and 37%, respectively. There was generally little systematic variation across the OIDP frequency items by clinical indicators of tooth decay and tooth loss (Table 3). A total of 59% versus 42% and 67% versus 39% ($P < 0.001$) of the

students with and without a diagnosis of tooth decay and tooth loss reported being affected on at least one daily performance. Multivariate analysis of variance with the 8 OIDP frequency items as originally scored revealed statistically overall differences with respect to tooth decay ($F = 2.13$, $P < 0.05$) only. Results from the between subject analyses revealed that item numbers 1 and 3 (i.e. eating and enjoying food and cleaning teeth) discriminated statistically significantly between students with and without tooth decay.

The mean OIDP frequency ADD and SC scores did not vary systematically with gender, age, and place of residence. As indicated in Table 4, students who reported dissatisfaction with general health status, non-medical students, regular dental attendees, and those with no experience regarding deliberate sugar restriction scored significantly higher on the OIDP frequency ADD and SC scores than did their counterparts in the opposite groups. Thus, the method of scoring the OIDP scale had only a marginal effect on its ability to detect differences between socio-demographically different groups. Notably, the mean OIDP scores declined in a linear fashion, as dental attendance decreased from twice a year to never. These associations were obtained using independent sample *t*-tests and one-way ANOVA and were confirmed by the corresponding non-parametric alternatives, Mann-Whitney U-test and Kruskal-Wallis test. Multivariate analyses of variance, GLM, with the 8 OIDP frequency scores, revealed statistically significantly overall difference with

Table 3. Percentage distribution (*n*) of single item OIDP frequency scores by clinical indicators. Single OIDP frequency items: percentages affected at least once or twice a month. OIDP SC scores: percentages affected on at least one daily performance and median values for each category of grouping variable

	Cavity % (<i>n</i>)	No. cavity % (<i>n</i>)	Missing teeth % (<i>n</i>)	No. missing teeth % (<i>n</i>)
Eating	51 (32)	31 (37)*	54 (34)	29 (35)**
Speaking	12 (7)	8 (9)	13 (8)	7 (8)
Cleaning teeth	23 (14)	12 (149)	18 (11)	15 (17)
Sleeping and relaxing	11 (7)	4 (5)	10 (6)	5 (6)
Smiling and showing teeth	13 (8)	10 (11)	12 (7)	10 (12)
Emotional status	10 (6)	7 (8)	8 (5)	7 (9)
Work and social role	8 (5)	6 (7)	8 (5)	6 (7)
Enjoying social contact	13 (8)	7 (8)	10 (6)	9 (18)
<i>OIDP SC score</i>	59 (36)	42 (47)*	67 (40)	39 (43)**
<i>Mean OIDP SC score</i>	1.6 (2.0)	0.8 (1.2)*	1.4 (1.8)*	0.9 (1.5)

* $P < 0.05$, ** $P < 0.001$.

Table 4. Mean scores and *s* (standard deviation) of the OIDP frequency scores according to socio-economic and behavioral variables

	OIDP ADD scores	OIDP SC scores
Non-medical subjects	11.0 (5.1)**	1.7 (2.1)**
Medical subjects	9.9 (4.1)	0.9 (1.6)
Health status – bad	11.6 (6.1)**	1.7 (2.2)**
Health status – good	10.0 (4.2)	1.1 (1.7)
No sugar avoidance	10.9 (4.6)*	1.3 (1.7)
Sugar avoidance	10.0 (4.5)	1.1 (1.8)
Dental attendance		
Twice a year	11.9 (6.1)**	1.9 (2.4)**
Once a year	11.0 (5.1)	1.6 (2.1)
Seldom	10.6 (4.6)	1.2 (1.6)
Never	9.8 (3.9)	1.0 (1.6)

* $P < 0.05$, ** $P < 0.001$.

respect to students' medical and non-medical status ($F = 2.61$, $P < 0.05$), opinion of general health status ($F = 2.5$, $P < 0.05$) and dental attendance ($F = 6.07$, $P < 0.001$). Results from the between subject analyses showed that all 8 OIDP items discriminated statistically significantly ($P < 0.05$) between medical and non-medical students, students with favorable and unfavorable opinion of general health condition and between dental attendees and non-attendees.

Multivariate logistic regression analysis with the OIDP SC scores as outcome variable revealed that the clinical indicators of oral disorders accounted for 10% points (Nagelkerke's $R^2 = 0.101$, Model chi-square 13.271, d.f. = 2, $P < 0.001$, percentage correctly classified 62.7%) of the explainable variance of the OIDP scores. Entering socio-demographic and behavioral variables significantly raised the explainable variance by 9% points to bring it to a final 19% (Nagelkerke's $R^2 = 0.199$, Model chi-square = 25.852, d.f. = 6, $P < 0.001$, percentage correctly classified 69%) (Table 5).

OHRQOL and QOL

As indicated in Table 6, Life Satisfaction scores varied systematically and positively with the 3 self-reported oral health indices (OIDP ADD scores, self-reported oral condition, and self-rated dental appearance) as well as

Table 6. Spearman's correlation among self-rated oral health and health and satisfaction with life scores (minimum number of cases 1083)

	Spearman's rho
Self-rated health condition	0.22**
OIDP frequency scores	0.12**
Self-rated oral condition	0.11**
Self-rated dental appearance	0.15**

* $P < 0.05$, ** $P < 0.001$.

Table 7. Life Satisfaction scores regressed upon OIDP scores and self-reported health status. Minimum number of cases 950. Unstandardized and standardized regression coefficients, B and Beta

	B	Beta
Place of residence where raised	0.862**	–
Students' medical/non-medical status	0.965**	–
Self-rated health condition	1.020**	0.180**
OIDP ADD frequency scores	0.006*	0.085*

* $P < 0.05$, ** $P < 0.001$.

The model is controlled for age and gender.

with self-rated health condition. Spearman's correlation coefficients ranged from 0.11 to 0.22 ($P < 0.001$). In a linear multiple regression analysis, students' medical-non-medical status, place of residence, self-rated health status, dental attendance, and sugar restriction were entered together with the 3 subjective oral health indicators to control for potential confounding factors. In terms of standardized regression coefficients, beta, self-rated health condition ($\beta = 0.16$, $P < 0.001$) and OIDP ADD scores ($\beta = 0.085$, $P < 0.05$) maintained their statistically significant relationship with life satisfaction (Table 7). The total exploratory effect in terms of adjusted R^2 was 0.089 (8.9%).

Discussion

The subjects investigated in this study reflect the variety in characteristics of Tanzanian adults attending higher education institutions in Dar es Salaam (26). Although

Table 5. Odds ratios (OR) and 95% confidence interval (CI) for respondents' OIDP SC scores (0 = never affected, 1 = affected on at least one daily performance) by clinical and non-clinical variables

	OR	95% CI
Block 1		
Tooth decay (Yes = 1 vs no = 0)	1.3	0.7–2.7
Missing teeth (Yes = 1 vs no = 0)	2.8	1.4–5.8
Block 2		
Students' status (non-medical = 1 vs medical = 0)	2.7	1.0–6.9
Self-rated oral health (dissatisfied = 1 vs satisfied = 0)	2.7	1.0–8.6
Regular dental attendance (no = 1 vs yes = 0)	0.6	0.3–1.3
Sugar avoidance (no = 1 vs yes = 0)	2.2	1.2–4.3

the UDSM constitutes the largest public government recognized university in Tanzania, it is questionable whether or not the participants are representative of students attending higher education institutions in Tanzania generally. Since the estimates obtained in this study do not apply to the general adult population, but are restricted to a selective but important sub-group, further data are required from different locations and populations in Tanzania to confirm or refute the findings reported here.

Although Tanzanian students had relatively good oral health as assessed by their dentition status, OHRQOL were still adversely affected by oral problems. About half (51%) of the students reported that an oral problem had affected them on at least one daily performance in the 6 months preceding the survey. In accordance with findings obtained previously, the associations derived from the OIDP frequency scores and the clinical indicators of tooth decay and missing teeth were relatively modest (8, 10, 11). A possible explanation is limitations on the part of the OIDP frequency scale itself. Generally, the OIDP frequency scores were moderately successful in detecting the impacts of oral disorders in the study population considered, with 49% of the participants having zero scores. This is probably due to the fact that the daily impacts described by the OIDP items are relatively complex and severe. Moreover, the 8-item OIDP scale may fail in encompassing the full range of impacts of oral disorders recognized by Tanzanian students. Nevertheless, this scale has shown acceptable psychometric properties when applied to low oral disease populations of Tanzanian university students (6) as well as to rural community dwellers in Thailand (4). This report also indicates that the OIDP frequency scores can be used to detect broader psychological outcomes in terms of life satisfaction, even after controlling for potential confounding factors in a multiple linear regression analysis.

Oral health perception and the medical and non-medical status of the students turned out to be the only consistent social predictors of OHRQOL. The lack of social and behavioral correlates observed in this study was less surprising, considering the homogeneous group of socially advantaged adults investigated. Non-medical students might be recognized as less advantaged than their medical counterparts, at least as far as access to students' health services is concerned. As indicated in Table 4, another finding that emerged from the analyses was that the method of scoring the OIDP measure had only a marginal effect on its ability to detect differences between groups. Consistent with results reported by Locker & Slade (10) and by Atchison et al. (17), the present data suggest that poor clinical condition impacts OHRQOL most seriously among the least affluent, in this instance the non-medical students at UDSM. In line with previous reports (18, 19), the link between less restricted sugar consumption and more unfavorable OIDP frequency ratings held up in the multivariate analysis, indicating that Tanzanian students take account of preventive behaviors when judging their OHRQOL,

irrespective of their oral disease status. At odds with the results reported by Chen & Hunter (18), Unell et al. (19), and Cushing et al. (7), the present ones reveal a clear negative gradient with respect to dental visiting; the more frequent this habit, the less favorable the OHRQOL ratings. It is plausible that dental attendance may be recognized as a proxy for oral problems and thus reflect treatment need among Tanzanian university students (27). According to Boehmer et al. (28), dental attendance and treatment in response to oral diseases reflect secondary prevention, which relates differently to indices of oral health status than do measures of primary prevention (e.g. sugar avoidance).

By examining the relationships between OHRQOL and clinical and non-clinical variables in a single regression model, it was possible to obtain a better understanding of the combined effects of these variables and to compare the predictive power of each. Although the amount of explained variance was low, suggesting a possible omission of important variables, social and behavioral variables explained as much of the variance in OHRQOL as did the clinical indicators of oral disorders. The higher levels of oral impacts expressed by students already disadvantaged in terms of their social and behavioral status were not due to higher levels of oral diseases, but probably to psychological factors linked with aspects of material and social deprivation. Thus, difficulties with eating and cleaning teeth were the sole impact that discriminated strongly between groups with and without tooth decay. Less oral disease-specific impacts, such as problems with sleeping and enjoying social contact, associated most strongly with students' socio-economic and behavioral characteristics. Whatever the explanation, the observed relationships support the theoretical proposition derived from the ICIDH model (12) that perceived oral health status is likely to be shaped by previous experience with oral behaviors as well as by socio-economic circumstances. Students who rated their oral health status favorably were more satisfied with their lives than students who rated their oral health unfavorably, suggesting that oral health contributes to QOL together with general health perceptions and socio-economic circumstances.

In summary, this study has provided evidence suggesting that the social and behavioral contexts in which Tanzanian students live are important in shaping their responses to oral disorders. This suggests that both clinical indicators of oral disorders and OHRQOL dimensions should be considered in comprehensive assessments of their oral health status. Social and behavioral variables explained as much of the variance of OHRQOL as did the clinical indicators of oral disorders. In turn, OHRQOL contributed to QOL in terms of Life Satisfaction together with general health perceptions and socio-economic circumstances.

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