BRIEF COMMUNICATION

Perceived Impact of Oral Health Conditions Among Minority Adolescents

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Abstract

Objectives: *This study assessed the perceived impact of oral health conditions, and the relationship of two measures of self-reported outcome, the RAND SF-36 and the Oral Health Impact Profile (OHIP), to clinical indicators of oral health among inner-city adolescents.* ***Methods:*** *A convenience sample of 93 minority adolescents completed the RAND SF-36 and the OHIP and 76 of them completed a clinical dental examination assessing DMFS.* ***Results:*** *Participants averaged 14.4 (SD=1.2) years old; 52 percent were female; and 86 percent were African-American. The mean DMFS was 8.8 (SD=6.3). Participants reported relatively poor general health on the SF-36 as well as poor oral health on the OHIP. None of the SF-36 subscales were significantly related to DMFS. OHIP subscales were consistently related to DMFS—those with worse oral health reported more impacts. With the exception of the bodily pain subscale of the SF-36, the SF-36 and OHIP subscales were significantly correlated with Pearson's correlations ranging from –.21 to –.57 (P<.05).* ***Conclusions:*** *Although the SF-36 and the OHIP were correlated, the OHIP appears to be more highly associated with the impacts of oral health conditions than the SF-36 among inner-city adolescents who reported low general and oral health quality of life. [J Public Health Dent 2000;60(3):189-92]*

Key Words: oral health, quality of life, minority health, adolescents, assessment.

Subjective self-report measures of impacts of health conditions on quality of life have expanded rapidly in the medical literature over the past 20 years. A number of both generic health status measures as well as disease specific measures have been developed and extensively tested for validity and reliability (1). Although the psychometric properties of the generic health-related quality of life measures are well known, previous studies have questioned whether they can detect differences in clinical oral health status (2,3). Many subjective oral health indicators developed during the last decade have demonstrated consistent patterns of association between oral health-related quality of life (OHRQOL) and clinical oral conditions typically observed in surveys of adult populations. Diminished OHRQOL has been linked to tooth loss, untreated dental decay, extensive periodontal disease, and limited access to dental care (4). Specific measures of OHRQOL are likely more sensitive than generic health status measures because oral health is perceived as a distinct dimension of overall quality of life. Although poor clinical oral status is disproportionately observed in disadvantaged populations (5,6), scant data are available on the subjective impact of oral health conditions on such adolescents. In short, little is known regarding the relationship between clinical oral health and quality of life issues. Examining such associations will clarify how oral health conditions affect social and psychological functioning and quality of life and may identify ways to increase oral health promotion activities to targeted individuals. The purposes of this study were: (1) to assess the clinical oral health status of inner-city minority adolescents; (2) to evaluate subjective health status among these adolescents using the RAND SF-36, a generic health status measure, and the Oral Health Impact Profile (OHIP); and (3) to examine the relationship of subjective health status measures to variation in levels of caries experience.

Methods

Advertisements were posted throughout the University of Medicine and Dentistry at New Jersey, a university-based health center, and through the local Division of Young Adult and Adolescent Medicine's community outreach program to recruit adolescents to participate in this study of oral health and related attitudes. Respondents contacted the research assistant, who explained the purpose of the study and determined whether they qualified for participation. Informed consent forms as approved by the Institutional Review Board were forwarded to the homes of volunteers; signatures by the parent or legal guardian were required. Ninety-three participants completed a demographic data form, the RAND SF-36, and the OHIP, and 76 completed the clinical examination at the dental school. Upon completion of the protocol, participants received $25 for their efforts.

The clinical oral exam was conducted by three trained and calibrated dentists using artificial light, mouth mirrors, #23 explorers, and periodontal probes. Each tooth was dried before the examination. Caries experience was determined using the methods described by Radike (7) and summa-

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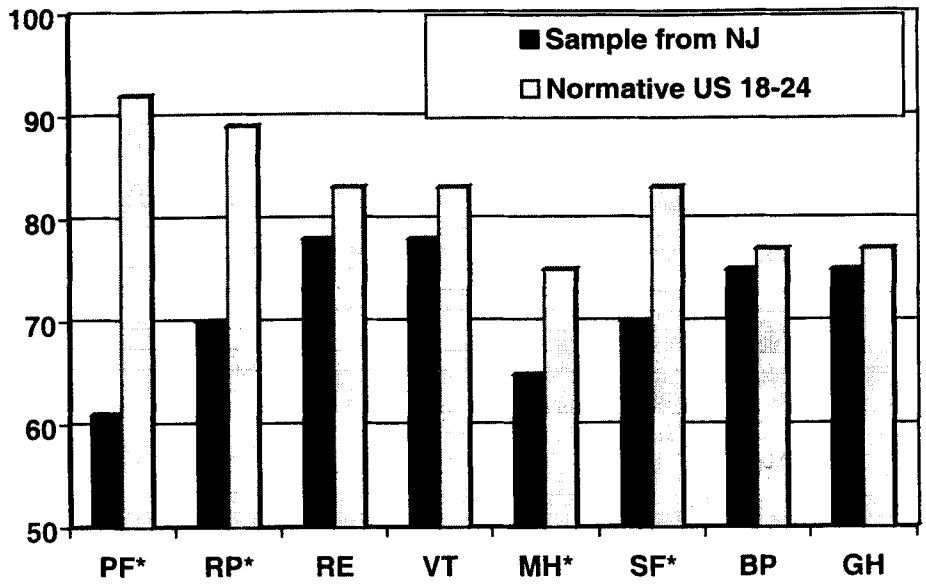
rized as the DMFS index.

The two self-report questionnaires were the RAND SF-36 and the OHIP. RAND SF-36 (8) is a 36-item survey that examines eight health concepts: physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, vitality, and general health perceptions; and a single item that indicates perceived change in health. Scores are standardized and range from 0–100; higher scores define more favorable health status. Cronbach's alpha levels range from 0.78–0.93. The SF-36 is a reportedly valid measure of health status that has been used to assess health outcomes in community populations as well as in patients with numerous chronic health conditions. Its authors state that individuals 14 years of age and older can complete the SF-36.

The OHIP (9) is a 49-item questionnaire measuring the social impact of oral conditions. Respondents rate how frequently they experience each of 49 impacts because of problems with their teeth or mouth. Responses are on a five-point Likert-like scale from never (coded 0) to very often (coded 4). The OHIP has seven subscales, including functioning limitations, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Each OHIP subscale can range from a minimum value of zero, indicating no impact on quality of life, to a maximum of 40, indicating frequent and severe impact. Cronbach's alpha levels, assessing internal reliability of the subscales, range from 0.70–0.83. The scale has been used in community populations in the United States, Canada, and Australia, primarily among older age groups. This study is the first one to use this scale with adolescents.

Measures of central tendency and frequency distributions were used to describe clinical oral health status and responses on the items in the questionnaires. SF-36 data from the participants were compared to published normative data from an age group that was closest in age to those studied (8). Because of the skewed distribution of DMFS, participants were categorized into three groups of roughly equal size as: low (0–5 DMFS), moderate (6–10 DMFS), and high (>10 DMFS) to ana-

FIGURE 1
Mean Subscale Scores on the SF-36, New Jersey Adolescents and US 18–24-year-olds



*P<.01.
PF—physical function.
RP—role physical.
RE—role emotional.
VT—vitality.
MH—mental health.
SF—social function.
BP—bodily pain.
GH—general health.

TABLE 1
Mean Scores on OHIP and Rand Subscales by DMFS Categories*

Subscales	Total Sample (*N*=76) Mean (SD)	DMFS 0–5 (*N*=30) Mean (SD)	DMF 6–10 (*N*=23) Mean (SD)	DMFS >10 (*N*=23) Mean (SD)
OHIP				
Functional limitations*	14.1 (11)	11.3 (10)	12.8 (10)	19.2 (13)
Physical disability*	9.8 (13)	6.3 (9)	8.9 (12)	15.6 (16)
Psychol. discomfort†	7.3 (8)	4.5 (5)	6.4 (7)	11.6 (10)
Physical discomfort†	16.7 (12)	12.0 (9)	17.1 (11)	22.4 (14)
Psychological disability*	6.8 (8)	4.1 (7)	5.9 (7)	11.2 (9)
Social disability	4.3 (7)	2.8 (5)	4.5 (8)	6.2 (8)
Handicap*	4.6 (7)	3.2 (6)	3.0 (6)	8.1 (10)
RAND				
Physical function	60 (33)	57 (33)	56 (38)	59 (26)
Role physical	71 (30)	76 (30)	71 (31)	76 (30)
Role emotional	77 (29)	83 (27)	71 (32)	76 (31)
Vitality‡	65 (17)	68 (21)	64 (13)	63 (16)
Mental health	70 (20)	75 (21)	70 (20)	63 (18)
Social functioning	74 (25)	78 (24)	74 (30)	70 (19)
Pain	82 (20)	80 (21)	82 (23)	84 (18)
General health*	72 (19)	73 (19)	73 (19)	69 (18)

*P<.05.
†P<.001 using ANOVA.
‡P<.10.

lyze the relationships between caries experience and scores on the RAND SF-36 and the OHIP subscales. For descriptive purposes, a measure of unmet treatment need was calculated by dividing the number of decayed surfaces (DS) by the total number of decayed and filled surfaces (DFS), except for subjects with no caries experience (DMFS=0), where the proportion was computed as 0. Pearson's correlations between the subscales of the SF-36, the OHIP, and caries experience (DMFS) were computed. Differences between the subjective health measures were evaluated by comparing mean SF-36 and OHIP scores among adolescents with three categories of DMFS. Statistical significance was assessed using one-way analyses of variance (ANOVA).

Results

Participants were adolescents between 12 and 17 years of age with a mean of 14.4 years (SD=1.2). Forty-eight (52%) were female, 45 (48%) were male, 80 (86%) were African-American, and 13 (14%) were Latino/white.

The mean DMFS for the entire sample was 8.8 (SD=6.3), 4 participants (5%) had zero DMFS, and 23 (34%) had DMFS scores of greater than 10. Only nine (11%) subjects had experienced tooth loss, and hence the number of missing surfaces (mean=1.1, SD=3.5) was only a minor component of the total DMFS in this sample. However, sixty-nine subjects (91%) had at least one decayed surface and 34 (45%) had DS/DFS of 100 percent, thereby indicating a very high level of unmet need among the participants.

Figure 1 presents a comparison of RAND subscales for the New Jersey sample and normative data for the SF-36 for males and females aged 18–24 years (8). (No data are available on a more comparable age group.) Scores for the New Jersey sample were similar to the normative data on the role–emotional, vitality, social functioning, bodily pain, and general health. However, New Jersey participants had significantly worse reported health status on the physical function, role–physical, mental health, and social function subscales ($P<.01$) than the normative group.

Table 1 presents the mean scores on the OHIP and the RAND SF-36 subscales for the entire sample and for each of the three categories of DMFS. For the OHIP, the subscales with the highest scores (greatest impacts) were the physical discomfort subscale (16.7; SD=12), followed by functional limitations (14.1; SD=11). For the RAND, the lowest scores (indicating greater impacts) were observed on the physical function scale with a mean of 60 (SD=33). The analysis of the relationships between the OHIP and RAND subscales and DMFS categories illustrates that all of the OHIP subscales except the social disability scale were significantly associated ($P<.05$) with DMFS categories. Participants with higher DMFS scores reported higher (greater impact) OHIP scores. Items from the physical discomfort and functional limitations scales had the highest elevated scores. None of the RAND SF-36 subscales differed significantly by caries level.

Pearson's correlations were used to assess the relationships among the RAND SF 36 and the OHIP subscales (Table 2). Moderate correlations between subscales from the two instruments included: –0.57 RAND social disability and OHIP social functioning; –0.54 RAND mental health and OHIP psychological disability; –0.53 RAND mental health and OHIP psychological discomfort; and –0.51 RAND mental health and OHIP physical disability. Weak correlations (–.10 to –.21) were found between the RAND bodily pain subscale and each of the OHIP subscales.

Discussion

Subjects in this study were found to have a high level of caries and unmet treatment needs and to experience considerable physical, social, and psychological impact associated with their poor clinical oral health status. A mean DMFS per person of 8.8 is substantially higher than the 4.6 DMFS reported in the NHANES III data for black individuals of the same age group (6). Further, compared with RAND SF-36 normative data on slightly older individuals in the United States, adolescents in this study report worse health status on almost every subscale. Finally, OHIP scores in this study are higher than those found in other populations (4).

The most important finding in this study concerns the sensitivity of subjective health status measures to variations in clinical oral health status. De-

TABLE 2
Pearson's Correlations Between RAND SF-36 and OHIP Subscales

OHIP RAND	Psychol. Discomfort	Function Limitations	Handicap	Physical Disability	Pain	Social Disability	Psychological Disability
Physical function	–.12*	–.28†	–.25‡	–.23‡	–.19*	–.27†	–.19*
Vitality	–.33†	–.46†	–.28†	–.33†	–.50†	–.23‡	–.35†
Role physical	–.34†	–.47†	–.38†	–.35†	–.38†	–.37†	–.39†
Mental health	–.53†	–.57†	–.50†	–.51†	–.52†	–.50†	–.54†
Social functioning	–.39†	–.44†	–.53†	–.42†	–.41†	–.56†	–.43†
Role emotional	–.36†	–.37†	–.41†	–.48†	–.37†	–.46†	–.39†
Bodily pain	–.10*	–.21‡	–.15*	–.21‡	–.19*	–.12*	–.10*
General health	–.38†	–.47†	–.43†	–.44†	–.44†	–.48†	–.38†

*Not significant.
†$P<.01$.
‡$P<.05$.

spite some moderate correlations between the SF-36 and OHIP, only the latter revealed consistently higher impacts on quality of life among people with extensive caries experience (DMFS >10), compared to people with less caries experience. For the clinical assessment, we used the DMFS index because it captures cumulative caries experience, regardless of whether the caries occurred earlier or later in life, and regardless of whether it was treated or untreated. Untreated disease (i.e., the D component of DMFS) might have a greater impact on quality of life than restored disease (i.e., the F component); however, our study does not have sufficient numbers of subjects to explore such issues. Furthermore, there may be circumstances in which a small asymptomatic cavity, detected at clinical examination, causes less impact on subjective health status than a filled tooth of which the subject is conscious because of appearance or other factors. Our finding that caries experience is associated specifically with subjective oral health status, but not subjective general health status, suggests that dental health might have subtle aspects perceived to be unique in overall health.

Broad generalizations about the oral health of minority adolescents cannot be made on the basis of this study because of the select nature of the sample. However, the results suggest a need to further assess the oral health status and unmet treatment needs among urban disadvantaged adolescents. Although the two questionnaires are well correlated, only the OHIP is associated with DMFS. Thus, the OHIP may prove to be a sensitive screening tool to identify people with high levels of self-perceived impact due to oral conditions. Minority adolescents may represent a priority group for oral health promotion regimens and comprehensive treatment protocols in the community.

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