Relationship between Oral Health Status and Oral Health Related Quality Of Life in Adults Attending H.P Government Dental College, Shimla, Himachal Pradesh- India

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Abstract

Objectives: To describe Oral Health Related Quality of Life (OHRQoL) in adults attending the Outpatient Department (OPD) of Public health Dentistry, H.P Government Dental College, Shimla, and to assess the relationship between clinical measures of oral health status and oral health related quality of life.

Methods: A cross sectional study was carried out for a period of three months on 351 subjects reporting to the OPD of Public health Dentistry, H.P Government Dental College, Shimla. Subjects were examined systemically for dental caries, periodontal disease using DMFT index and CPI index. OHRQoL was measured using the 14 – item Oral Health Impact Profile questionnaire (OHIP-14). Also the data on education, socio economic status and reasons for seeking dental care was collected.

Results: There were 158 males and 193 females participating in the study. The mean age of study population was 35.7 ± 9.33. The mean total OHP-14 score was 9.5 ± 9.4; 35.6% of the subjects reported one or more OHIP problems 'fairly often or very often'. When the prevalence of impacts fairly /very often was modeled using logistic regression, presence of decayed teeth, presence of periodontal disease (CPI score >2) and number of missing teeth remained significantly associated with OHRQoL after adjusting for gender and episodic dental care.

Conclusion: OHIP-14 scores were significantly associated with the clinical oral health status indicators, independently of gender and socio economic inequalities in oral health.

Key words: Oral health, Oral health related quality of life, Oral health impact factor

Introduction

Quality of life is a broad concept concerned with the overall wellbeing in society. The World Health Organisation (WHO) defines QOL as an "individuals perception of their position in life in the context of the culture and value customs in which they live and in relation to their goals, expectations, standards and concerns'' [1]. Its aim is to enable people, as far as possible to achieve their goals and choose their ideal lifestyle. The increasing use of the terms "health-related quality of life" and "quality of life" in relation to the outcomes of health conditions and therapy for those conditions has been seen in medicine in the last 30 year [2].

Oral health-related quality of life is defined as an individual's assessment of how the following affect his or her wellbeing: functional factors, psychological factors, social factors, and experience of pain/discomfort in relation to oro-facial concerns [3]. Oral diseases such as dental caries and periodontal disease are highly prevalent. The consequences of oral problems are not only physical, they are also economic, social and psychological. They seriously impair quality of life in a large number of individuals and can affect various aspects of life, including oral function, appearance, and interpersonal relationship [4-6]. Linca Hodacova reported a significant association between OHIP scores and presence of decayed teeth & presence of periodontal diseases. Naveen Ingle reported that the caries status and the number of missing teeth were significantly correlated with most of the sub domains of OHIP -14 [7]. The outcome of oral health problems has been the subject of significant research activity over the last decade or so. Measures of oral health related quality of life are increasingly used in descriptive population based research as a means of capturing non clinical aspects of oral health that patients' seem most relevant to their overall health and wellbeing [8].

When oral health related quality of life measures are used alongside traditional clinical methods of measuring oral health status, a more comprehensive assessment of the impact of oral diseases on the several dimensions of subjective wellbeing becomes possible [9-13].

The most widely used instrument is the Oral Health Impact Profile (OHIP), and its shortened version (OHIP-14). The questionnaire measures the impact of oral problems and covers physical, psychological and social dimensions of daily living. It is divided into seven dimensions, each with two items. The responses are scored on a five point Likert scale, from never to very often [14].

The hypothesis of the study is that subjects with poor oral health status has negative impact on the oral health related quality of life as compared to the subjects with good oral health . So, the present study was planned to assess the oral health related quality of life in adults attending the outpatient Department of Public Health Dentistry, H.P Government

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Dental College, Shimla, and to assess the relationship between clinical measures of oral health status and oral health related quality of life.

Materials and Methods

A cross sectional epidemiologic study was conducted among the adult population attending the OPD of Public Health Dentistry, H.P Govt. Dental College, Shimla. Verbal consent for the participation in the study was obtained. Using the power and sample size calculation program version 3.0.14 [15] and based on the prevalence of dental caries (90%) among adults in Himachal Pradesh [16] , with 80% power (β=0.20) and precision of 0.05(α=0.05), a sample size of 291 was obtained. So, a convenient sample size of minimum 300 patients was decided. The inclusion criteria was patients above 18 years of age and who could understand English or Hindi. The study population was patients with the above inclusion criteria, attending the Department of Public Health Dentistry, H.P Govt. Dental College, Shimla. A total of 364 subjects gave their verbal consent to participate in the study, but there were 13 dropouts. So the study population of 351 was obtained over a period of three months (Feb 2013 to April 2013).

Data collection was carried out by one of the authors trained for clinical examination during several sessions in the department of Public Health Dentistry, Government Dental College, Shimla. A personnel interview was conducted using the questionnaire in English/Hindi language. Questionnaire was on oral health impact profile- 14 (OHIP-14). For each of the 14 items, study members were asked how often they have experienced the problem in past six months. The responses was coded as never (0), hardly (1), occasionally (2), fairly often (3), very often (4). OHIP -14 scores were computed in two ways: first, a total OHIP-14 score was calculated by summing responses over all 14 items, with possible scores ranging from 0-56; secondly, OHIP-14 subscale scores were calculated for each of the dimensions by summing the ordinal response scores for the two items comprising each subscale. The total OHIP-14 score and the subscale scores constitute measures of 'severity' of adverse impacts caused by oral conditions, whereby the higher the OHIP-14 score, the poorer the OHRQoL [8]. To enable comparison with data from similar studies, two other summary measures were also computed: (i) the prevalence (percentage) of people reporting one or more items 'fairly often' or 'very often' and (ii) the extent (number of items reported 'fairly often' or 'very often') [17].

General information about the age, gender and socio-economic status was also recorded. Educational background of the individuals was as follows; basic education: primary, middle and higher school education while further educational group included the graduate and postgraduate education. The socio economic status was determined by Kuppuswamy's scale [18] which divided the subjects into lower, middle and upper socio economic class.

The subjects were clinically examined for dental caries using DMFT index given by Klein and Palmer (1938) [19] and periodontal health status by Community Periodontal Index (CPI) [20]. In this study, subjects with a score of 3 and

4 were defined as a case of periodontal disease. An estimate of accumulated tooth loss was obtained by counting the number of missing teeth.

Use of dental services was determined by asking participants whether they usually visited the dentist for a checkup or only when the dental problem arouses. Those who reported latter were designated as 'episodic users' of dental services because of the intermittent use of these services [14].

The data collected was analyzed by Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, version 16 for windows. Descriptive statistics such as mean, proportions were used to describe the distribution of OHIP-14 scores and the prevalence, extent, and severity of impacts of oral disorders. The independent variables selected for analysis (Dental Caries, Periodontal Disease, Missing teeth due to caries and usual reason for visit to a dentist) were dichotomized based on the data distributions, and the bivariate relationships between each independent variable and the prevalence of impacts reported 'fairly often or very often' were evaluated using the Pearsons chi-squared test. The strength of these relationships was represented by an odds ratio computed through stratified analysis by gender. Multivariate analyses were used to control for the potential influences of gender, use of dental services and SES on the relationship between OHRQoL and clinical measures of oral health status.

Results

Of the 475 new patients who visited the Department of Public Health Dentistry of H.P Government Dental College, 403 were eligible for the study. Out of eligible subjects 364 subjects agreed to participate, indicating the participation rate of 90.3%. Finally there was a study population of 351 after a drop out of 13 subjects. There were 158 males and

Table 1. Demographic characteristics of subjects (n=351).

Demographic characteristics	n (%)
Gender	
Male	158 (45.01)
Female	193 (54.98)
Age (Years)	
20-29	87 (24.7)
30-39	124 (35.4)
40- 49	106 (30.1)
50- 59	22 (6.3)
60-69	12 (3.5)
Marital status	
Unmarried	96 (27.3)
Married	215 (61.4)
Widowed	29 (8.2)
Divorced	11 (3.2)
Education	
Basic	254 (72.4)
Further	97 (27.6)
Socioeconomic status	
Low	76 (21.6)
Medium	211 (60.3)
High	64 (18.1)
Purpose of last dental visit	
Routine check up	72 (20.6)
Due to some problem(episodic users)	279 (79.4)

193 females participating in the study. The mean age of study population was 35.7 (SD ± 9.33 ranging from 21 years to 64 years). Most of the participants belonged to the high-SES (18.1%) or medium SES (60.3%), while 21.6% were in the low SES group (*Table 1*).

Oral health by sex and SES
The prevalence of decayed teeth was significantly higher among males as compared to females. Also the prevalence of periodontitis was higher in males. More males than females were episodic users of dental services. Study members in the low SES group had worse oral health than those who were better off socioeconomically both with respect to caries and periodontitis (*Table 2*).

OHRQoL
The distributions of responses to individual OHIP-14 items with their mean scores are given in *Table 3*. Mean score ranged between 0.25 for handicap to 2.92 for physical pain. The most commonly reported impacts were within the dimensions of 'physical pain', 'psychological discomfort' and 'physical disability'. Only 0.75% to 10.2% reported negative impacts within the dimensions of handicap, social disability or psychological disability 'fairly often' or 'very often' with their mean ranging from 0.25 to 0.91 (Table 4).

Table 4 summarizes the data on prevalence, extent and severity of impacts by OHIP-14 dimension and total scale score. 35.6% reported one or more OHIP items 'fairly often' or 'very often' with an overall mean of 0.39 items reportedly 'fairly often' or 'very often'. The mean severity score, summed for the 14 items in the scale was 9.51. The physical pain, psychological discomfort and physical disability dimensions accounted for highest prevalence, extent and severity of impacts.

Oral health status and OHRQoL
The bivariate associations between the prevalence of impacts (fairly/very often) and the clinical measures were analyzed separately by gender (*Table 5*). Dental caries, periodontal disease and tooth loss were significantly associated with functional limitation, physical pain and psychosocial impacts. Females have shown stronger significant association of Dental Caries, periodontal disease and for routine checkups and OHRQoL as the odds ratio were higher among females than males.

The results of the multiple regression model for the prevalence of impacts (fairly/very often) shows that gender, socioeconomic status, dental caries, periodontal disease, number of missing teeth were significantly associated with OHRQoL (*Table 6*).

Discussion

The study was performed to describe the OHRQoL and its associated oral health variables in adult population attending the outpatient department of Public Health Dentistry in H.P Government Dental College, Shimla-India.

In the current study, around 35% of the subjects reported that their oral condition had negatively impacted upon them in some way 'fairly often' or 'very often' over the preceding 6 months thereby affecting their quality of life. The prevalence of negative impacts in this study is higher than that of 15.9% in U.K, 18.2 % in Australia [21] and 23.4%in New Zealand [22].

Table 2. Oral Health Characteristics of the Population by Gender and Socio Economic Status.

CHARACTERISTICS	GENDER		SES		ALL COMBINED n (%)
	Male n (%)	Female n (%)	High/Medium n (%)	Low n (%)	
Decayed Teeth	118 (54.4)	98 (45.6)*	94 (43.7)	122 (56.3)	216 (61.5)
Periodontal disease	97 (58.7)	68 (41.3)*	77 (46.9)	88 (53.1)*	216 (61.5)
Tooth loss due to caries 1+ teeth missing	44 (57.9)	32 (42.1)**	24 (31.5)	52 (68.5)***	76 (21.6)
Episodic users	139 (61.2)	87 (38.8)***	76 (33.7)	150 (66.3)***	226 (64.3)

Chi square test: *P<0.05;*P<0.01;***P<0.001:

Table 3. Distribution of responses (%) to OHIP-14 items, and mean scores subscales.

Conceptual domains and questions	Never (0)	hardly ever (1)	Occasionally (2)	Very often /fairly often (3)/(4)	mean (SD)
Functional limitation					
Trouble pronouncing words	282 (80.3)	18 (5.1)	35 (10.1)	16 (4.5)	1.21 (1.72)
Felt sense of taste worsened	288 (82.1)	22 (6.4)	25 (7.1)	10 (2.8)	
Physical pain					
Had painful aching in mouth	223 (63.5)	32 (9.1)	55 (15.8)	41 (11.6)	2.92 (2.02)
Uncomfortable to eat foods	209 (59.5)	46 (13.2)	55 (15.7)	41 (11.6)	
Psychological discomfort					
Been self-conscious	245 (69.8)	10 (3.0)	67 (19.0)	29 (8.2)	2.12 (2.13)

Table 4. Prevalence, Extent and Severity of Impacts by OHIP-14 Subscale and Total Score.

Dimensions	Prevalence: fairly often/ very often	Extent: mean no of items reported fairly/ very often(SD)	Severity: mean OHIP-14 score (SD)
1. Functional limitation	16 (4.6)	0.15 (0.32)	1.21 (1.72)
2. Physical pain	43 (12.2)	0.19 (0.32)	2.92 (2.02)
3.Psychological discomfort	29 (8.2)	0.17 (0.23)	2.12 (2.13)
4. Physical disability	18 (5.2)	0.13 (0.39)	1.67 (1.55)
5. Psychological disability	12 (3.5)	0.08 (0.21)	0.91(1.15)
6. Social disability	2 (0.5)	0.04 (0.22)	0.43 (1.24)
7. Handicap	5 (1.5)	0.03 (0.27)	0.25 (1.03)
Total OHIP -14 score	**125 (35.6)**	**0.39 (1.01)**	**9.51 (9.47)**

Table 5. *Prevalence of Impacts (fairly/very often), by gender, oral disease prevalence and usual reason for visiting a dentist.*

Variable	Males			Female		
	N (%)	Odds ratio	p value	N(%)	Odds ratio	p value
Dental Caries						
Not present	4 (10.0)	1.00	< 0.001	27 (27.8)	1.00	0.031
Present	30 (25.4)	1.19 (1.12-2.38)		4 (50.0)	2.13 (1.04-2.16)	
Periodontal Disease						
Not present	14 (22.9)	1.00	0.012	38 (30.4)	1.00	0.022
Present	49(50.5)	2.06 (1.03-2.50)		57 (83.8)	2.43 (1.51-2.21)	
Tooth loss due to caries						
0 teeth missing	10 (8.77)	1.00	< 0.001	35 (21.7)	1.00	< 0.001
1+ teeth missing	21 (47.7)	2.71 (2.19-3.22)		23 (71.8)	2.31(1.81-2.41)	
Usual reason for visit to a dentist						
Check up	2 (4.80)	1.00	< 0.001	23 (71.8)	1.00	< 0.001
Problem	41 (29.4)			29 (33.3)	3.24 (2.17-3.39)	

Pearson chi square test.

Table 6. *Logistics Regression Model for prevalence of impacts (fairly often/ very often) (n=351).*

	Coeff	Odds ratio	95% CI for OR	P value
Constant	- 1.311	-	-	-
Female	0.122	1.33	0.83-1.57	0.031
Low Socio economic status	0.421	1.45	0.91- 1.87	0.022
Episodic dental user	0.672	1.01	0.53-1.52	0.081
Any decayed teeth	0.173	1.98	0.74- 0.96	<0.001
Case of periodontal Disease	0.572	1.53	0.59-0.86	0.011
No of missing teeth due to caries	0.214	1.21	0.65-0.93	<0.001

On comparing the extent scores, the present study estimates (0.36) were similar to those from U.K(0.39) but lower than from Australia [21] and New Zealand (0.46 and 0.55) [22]. The severity score was higher in the present study (9.5) as compared to U.K (5.1), Australia (7.5) and New Zealand (8.0) but comparable to 8.8 and 11.2 in Gujarat and Rajasthan, India [23]. The difference in the prevalence of negative impacts can be explained by differences in sampling strategies and/ or participation rates or it may be that negative impacts are less frequent in developed countries as the oral health services available to the population, comprise both preventive and curative services, while, in developing countries, oral health services are mostly relief oriented.

In the present study, females experienced more severe impacts of oral disorders (6.19 ± 5.47) on everyday life (represented by higher OHIP-14 mean score) than males (3.36 ± 2.67), which was also reported by Lawrence et al [8] and Navin Ingle [24] and this was despite the fact that females in this study had fewer carious teeth, fewer missing teeth and less prevalence of periodontal disease. Sex differences in OHRQoL cannot be solely explained by poor oral health status; to further understand differences in OHRQoL between men and women, the different life course influences for each sex must be considered.

In this study, the prevalence of handicap (response categories fairly often or very often) was 1.5% which is less than 6% as reported from a National survey from Germany [25] and from Czech population [7] (23.4%). The difference may be because the mean age of this study population was 35.7+9.33 while the median age in other two studies was above 40 years, and the people of younger age group are known to cite a lower impact of oral health on the handicap dimension quality of life because one of the strongest predictors for impaired oral health is tooth loss in old age as reported by Lawrence HP [8]. Locker's theoretical model of oral health has also indicated that social disability and handicap are less frequent and measure the most comprehensive impact on quality of life [17].

The prevalence of physical pain (response categories fairly often or very often) was 12.2%. And was reported mostly by those having one or more decayed teeth and this finding is consistent with the findings of Adulyanon [26] and Shashidhar Acharya [27]. The prevalence of functional limitation and psychological discomfort (response categories fairly often or very often) was 4.6% and 8.2% and was mostly reported by those having missing teeth and these findings are consistent with the findings of Slade GD [21].

Out of 351 study subjects, there were 45.02 % males and 54.98% females which can be explained by the fact that more females normally attend dental practice and gender based difference are quite apparent, with the utilization of dental care, services and treatment outcomes, which was also reported by Shashidhar [27] and Lawrence [8].

The present study has several strengths. Foremost among these is that the study used both clinical indicators of oral health status and a multi – item OHRQoL scale. Clinical indicators of oral health status were significantly related to the measure of OHRQoL. Further personal interview was preferred compared to original self-reported form because it is well described in the literature [10], that the use of the OHIP-14 in the questionnaire format may result in lower completion rates and loss of data which could be linked to the educational level of the participants. Literacy impairments could affect the participants when answering some questions in the questionnaire format. However, the administration of

interviews requires more time and resources than the use of questionnaires.

The present study also has some limitations. Firstly, convenience sample of patients attending the Government Dental College, Shimla that may influence its interpretation and generalizability. So results cannot be assumed to apply to the general population. The low sample size could have impacted the results in respect to the effect of sex and oral health status variables on OHRQoL. However the apparent effect on OHRQoL is in accordance with previous studies [9,10]. Also the study was cross sectional and other factors were not considered. So, further studies are needed with definite populations; especially in different social and cultural environment as these factors play an important role in both oral hygiene status and its impact on quality of life.

Summary & Conclusion

About one third of the population reported that their oral condition had negatively impacted them in some way thereby affecting their quality of life. Females experienced more severe impacts of oral disorders on every days life than males despite the fact, that females in this study had fewer carious teeth, fewer missing teeth and less prevalence of periodontal disease. OHIP-14 scores in this study were significantly associated with oral health status after controlling for gender, SES and use of dental services. These findings indicate that self-reported OHRQoL measures have a future, in population based surveys not as a substitute for the oral examination, but as an adjunct to identifying the conditions with the most potential to compromise patient well-being and quality of life. So, it can be beneficial, if we use OHRQoL instruments along with traditional measures, especially when planning public health services for those most in need of oral health promotion interventions or community based strategies. When health care resources are scarce, findings from such patient based outcome measures can be used to ensure that services/funding are directed at those conditions most likely to have negative effect on OHRQoL of specific populations.

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