Oral Impacts On Daily Performance In An Adult Population Attending An Institution In Bengaluru: The Influence Of Number Of Missing Teeth, And Sociodemographic Factors

Dr. Mayur Nath T. Reddy

(Professor and Head of Department, Department of Public Health Dentistry, Vydehi Institute of Dental Sciences and Research Centre, Nalurahalli, Whitefield, Bangalore

Dr. Antarika Gogoi

Post Graduate student, Department of Public Health Dentistry, Vydehi Institute of Dental Sciences and Research Centre, EPIP area, Nalurahalli, Whitefield, Bangalore

Abstract: Introduction: A cross sectional study was conducted to assess the relationship between oral health-related quality of life using the OIDP scale and specific clinical dental measures for need assessment among a population attending a dental institution located in Bangalore city, India. Methods: It was carried out among the patients visiting Vydehi Institute of Dental Sciences and Research Centre, Bengaluru for two-month duration. The study was approved by the Institutional Review Board and informed consent was obtained from the participants. The study was carried out on 300 patients using simple random sampling. The questionnaire consisted of information on demographic details, OIDP Inventory and 3 questions on self-rated oral health status and ADA type IV (Inspection) examination. Level of significance is set at 5%. Results: In the present study, the impact of oral status on 8 aspects of daily performance might be considered as severe because 92% of adults reported one or more oral impacts in the 6 months preceding the survey. Around one third of the participants reported impact of very severe or severe intensity. Speaking and eating were the most severely affected daily performances. Males had higher OIDP scores than females (p<0.001) and people who had better self-rated oral health had higher OIDP scores (p<0.001). Conclusion: A strong and consistent relationship between most of the clinical measures of oral health status and perceived impacts was observed. Public Health Significance: The greatest potential contribution of dentistry is in the ways it can affect the quality of life at the individual and the community level. Therefore, means must be promoted to demonstrate and measure such contributions in terms that policy makers, planners, administrators, and the public can understand.

Keywords: OIDP, OHRQoL, missing teeth, sociodemographic factors.

I. INTRODUCTION

The concept of health and disease is as old as man itself. From time immemorial man has been interested in trying to control disease. An understanding of health is the basis of all health care. The concept of *Health* has now, evolved over the centuries as a concept from an individual concern to a world-wide social goal and encompasses the whole quality of life. distinction between disease and health has other important implications. First, it can be used to evaluate current definitions of oral health. Yewe-Dwyer defined oral health in the following way: *"Oral health is a state of the mouth and associated structures where disease is contained, future disease is inhibited, the occlusion is sufficient to masticate food and the teeth are of a socially acceptable appearance."*

Oral conditions are known to affect various aspects of quality of life. Variables such as pain, impaired speech, chewing ability, taste, and appearance are commonly cited. In dentistry, some instruments which cover a broad spectrum of quality of life were proposed and compared with clinical oral status. Dental pain and discomfort were associated with higher mean decay scores. Dissatisfaction with dental appearance was associated with one or more decayed teeth and two or more missing teeth and fewer functioning teeth.

Communication restriction was associated with decay status and functioning teeth. Quality of life was compromised by edentulousness, xerostomia, and soft tissue lesions. Poorly fitting dentures affected eating and food choices. Conditions such as oral clefts, missing teeth, severe malocclusion, or severe caries were associated with feelings of embarrassment, withdrawal, and anxiety. Oral and facial pain from dentures, temporomandibular joint disorders, and oral infections affected social interaction and daily behaviours. Since there are important links between quality of life and clinical oral status, the significant impacts should be used to assess needs. An increasing concern about multidimensional concepts of oral health has led to the development of many theoretical concepts and measures of oral health related quality (OHRQoL) or socio-dental indicators. Socio-dental indicators, defined as "measures of the extent to which oral conditions disrupt normal social role functioning and lead to major changes in behaviours such as inability to work or attend school, or undertake parental or household duties". In general, their theoretical frameworks present the multidimensional character of oral health involving both biomedical and socio-medical concepts and represent the personal and social outcomes such as physical, psychological, functional and social outcomes.

Oral Impacts on Daily Performance (OIDP) is a newly developed indicator that attempts to measure oral impacts that seriously affect the person's daily life. OIDP was developed in 1996, earlier it was called as Dental Impacts on Daily Life (DIDL). OIDP was used first among low dental disease Thai population, and in 2003 it was used among Tanzanian students. It is based on an explicit conceptual framework, the World Health Organization's International Classification of Impairments, Disabilities and Handicaps, ICIDH, which has been amended for dentistry by Locker consisting of the following key points; impairments, functional limitations, pain and discomfort and disability and handicap. Impairments refer to immediate biophysical outcomes of disease, commonly assessed by clinical indicators. Functional limitations are concerned with functioning of body parts whereas pain and discomfort refer to the practical aspects of oral conditions in terms of symptoms. Finally, ultimate outcomes of disability and handicap refer to any difficulty in performing activities of daily living and to broader social disadvantages. The use of oral health-related quality of life indicators and measures of perceived needs has highlighted the large difference between normative and perceived assessments of dental treatment needs, and demonstrated an inconsistent relationship between clinical measures and oral symptoms and impacts. Overall the associations between clinical indicators of normative needs and measures of oral health-related quality of life were weak. However, the associations were better for specific clinical conditions such as missing teeth, particularly anterior teeth. Because of different findings for overall and specific clinical conditions it is worthwhile an attempt to investigate the relationship between oral health-related quality of life using the OIDP scale and specific clinical dental measures for need assessment among a population attending a dental institution located in Bangalore city, India. So, the present study was undertaken with the aim of assessment of oral health-related quality of life using the OIDP scale and specific clinical dental measures among a population attending a dental institution located in Bengaluru city, India.

II. METHODOLOGY

A cross sectional study is carried out among the patients visiting Dept. of Oral Medicine and Radiology, Vydehi Institute of Dental Sciences and Research Centre Bengaluru. The study was done for a duration of two months in March-April, 2017. Patients above 18 years of age who came for regular check-up or with complaint of pain were included in the present study. The ethical clearance was approved by institutional review board of Vydehi Institute of Dental Sciences and Research Centre, Bangalore. Written informed consent was obtained from the patients after explaining the purpose and details of the study to the study participants. The questionnaire was close ended, self-assessment instrument, containing demographic details, consent form, Questions on OHRQoL (Oral Health Related Quality of Life) and OIDP (Oral Impact of Daily Performances). The demographic details were name, gender, age, qualification, education, monthly income.

The questionnaire was translated from English to local language (Kannada) and Bengali (most OPD patients spoke Bengali) by Registered Institute of Translational Study, Bangalore. Assistance was provided by the examiner to fill questionnaire. For illiterate patients, examiner had filled the questionnaire by asking and explaining the questions. Kuppuswamy Scale 2016 was used to calculate the socio-economic status of the patients.

The Oral Impact of Daily Performance was performed using the OIDP Inventory, which is a self-assessment instrument with answers given in Likert-type five-point scale (1: Never affected in past 6 months, 2: Less than once a month, 3: Once or twice a month, 4: Once or twice a week, 5: Every day). This scale assesses impacts of oral health conditions that affect daily activities of an individual during the past 6 months and is commonly used as OHRQOL indicator. OIDP inventory is suitable for large population surveys due to it consists of few items and consumes short time. The OIDP inventory demonstrates individuals' physical, psychological and social dimensions of daily life, not only any oral problem is detected, but also its severity and degree are determined. Especially, it is important self-report information of patients about changing their oral conditions and affecting daily life for the clinicians during clinical decision-making process and treatment planning. The Oral Impacts on Daily Performances measure has acceptable psychometric properties, as well as a sound theoretical basis. OIDP was satisfactory as regards construct and criterion validity. The scores discriminated clearly between groups of relatively healthy and those with poor oral status, as well as between people who had different perceptions of overall oral impacts. A distinguishing feature is that it provides a significant endpoint outcomes scale for oral conditions within a concise, reliable and valid measurement. The sample size was scientifically calculated, using the prevalence of edentulousness in India. The participants were included after meeting the inclusion criteria and exclusion criteria making a

total of 300. Simple random sampling was adopted for selection of participants. The questionnaires were distributed to the randomly selected patients, and were self-completed by them. The total scores of all three sections were done by examiner. ADA Type III oral examination was conducted on the patients. Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in percentages. Level of significance is set at 5%. Chi-square test, ANOVA and independent t-test has been used to find the significance of study parameters on categorical scale using SPSS v.20.

III. RESULTS

		OIDP score 0.1-8.0	OIDP score 8.0-16.0	OIDP score >16	Total	Chi-square value	p-value
Gender	Male	44	59	74	177	9.720	0.002*
	Female	32	47	44	123		
SES	Upper	4	7	8	19	57.307	0.001*
	Upper-middle	23	30	34	87		
	Lower middle	26	30	46	102		
	Upper lower	23	32	37	92		
	Lower	0	0	0	0		
Self-rated oral health	Very good	6	8	10	24	145.7	0.001*
	Good	10	13	27	50		
	Fair	20	26	58	104		
	Bad	17	46	50	113		
	Very bad	1	3	5	9		
Number of missing teeth	No missing teeth	17	26	37	80	143.38	0.001*
	1-4 missing teeth	34	43	76	153		
	5-10 missing teeth	8	16	34	58		
	+10 missing teeth	2	2	5	9		

Table 1: Distribution of OIDP scores, by gender, socio-economic status, self-rated oral health and number of missing teeth

		Sum of Squares	df	Mean Square	F	Sig
Eating	Between groups	100.865	4	25.216	22.820	0.001*
	Within groups	325.972	295	1.105		
	Total	426.837	299			
Speaking	Between groups	143.579	4	35.895	28.648	0.001*
	Within groups	368.367	295	1.253		
	Total	511.946	299			
Cleaning teeth / dentures	Between groups	104.332	4	26.083	20.126	0.001*
	Within groups	381.012	295	1.296		
	Total	485.344	299			
Sleeping	Between	82.400	4	20.600		

		Sum of Squares	df	Mean Square	F	Sig
or relaxing	groups				20.412	0.001*
	Within groups	297.720	295	1.009		
	Total	380.120	299			
Smiling	Between groups	111.317	4	27.829	18.966	0.001*
	Within groups	432.869	295	1.467		
	Total	544.187	299			
Emotional stability	Between groups	102.868	4	25.717	20.916	0.001*
	Within groups	362.718	295	1.230		
	Total	465.587	299			
Working	Between groups	83.004	4	20.751	14.449	0.001*
	Within groups	423.663	295	1.436		
	Total	506.667	299			
Social activities	Between groups	46.930	4	11.733	7.834	0.001*
	Within groups	441.800	295	1.498		
	Total	488.730	299			

Table 2: Association between Self rated oral health and OIDP variables

		Sum of Squares	df	Mean Square	F	Sig
Eating	Between groups	38.008	3	12.669	9.645	0.001*
	Within groups	388.828	296	1.314		
	Total	426.837	299			
Speaking	Between groups	104.070	3	34.690	25.090	0.001*
	Within groups	407.877	296	1.383		
	Total	511.946	299			
Cleaning teeth / dentures	Between groups	66.507	3	22.169	15.614	0.001*
	Within groups	418.838	296	1.420		
	Total	485.344	299			
Sleeping or relaxing	Between groups	32.467	3	10.822	9.214	0.001*
	Within groups	347.653	296	1.175		
	Total	380.120	299			
Smiling	Between groups	54.264	3	18.088	10.928	0.001*
	Within groups	489.923	296	1.655		
	Total	544.187	299			
Emotional stability	Between groups	62.991	3	20.997	15.437	0.001*
	Within groups	402.596	296	1.360		
	Total	465.587	299			
Working	Between groups	49.413	3	16.471	10.662	0.001*
	Within groups	457.253	296	1.545		
	Total	506.667	299			
Social activities	Between groups	20.514	3	6.838	4.323	0.005*
	Within groups	468.216	296	1.582		
	Total	488.730	299			

Table 3: Association between Self rated oral health and OIDP variables

OIDP variable	No missing teeth	1-4 missing teeth	5-10 missing teeth	+10 missing teeth	t-Test	
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	t	Sig.
Eating	1.912±1.23	2.62±1.12	2.741±0.98	3.22±1.563	35.903	0.001*

Speaking	1.650±1.19	2.71±1.21	3.31±0.97	3.00±1.58	33.665	0.001*
Cleaning teeth / dentures	1.675±1.09	2.62±1.28	2.92±0.96	2.77±1.64	32.944	0.001*
Sleeping or relaxing	1.63±1.08	2.24±1.11	2.56±0.975	2.11±1.26	32.874	0.001*
Smiling	1.725±1.3	2.5±1.33	2.93±1.106	2.33±1.32	30.471	0.001*
Emotional stability	1.55±1.02	2.43±1.26	2.81±0.981	2.44±1.667	31.554	0.001*
Working	1.63±1.12	2.39±1.30	2.77±1.14	2.33±1.65	30.159	0.001*
Social activities	1.58±1.15	2.03±1.26	2.343±1.29	1.88±1.76	26.689	0.001*

Table 4: Analysis between OIDP variables and number of missing teeth

IV. DISCUSSION

Oral conditions are known to affect various aspects of quality of life. The OIDP index has acceptable psychometric properties, as well as a sound theoretical basis and also it attempts to use the logical approach of impact quantification by assessing both frequency and severity. Moreover, it has demonstrated usefulness as an indicator in dental treatment need planning in Southern Chinese population in the study conducted by Zeng X et al., Brazilian population in the study conducted by Pereira KC et al. and Korean elderly population by Jung SH respectively.

In the present study, most of the study subjects belonged to the lower middle socio-economic class and it can be inferred from the results that high income group had lower OIDP scores while low-income counterparts were likely to have higher OIDP scores. The study conducted by Srisilapanan among the older Thai individuals is in accordance with the current study.

Results of the present study show that subjects who had visited dentists were more likely to have low oral impact scores compared to those who had never seen dentists. Majority of the patients i.e. 226 (75.6%) had visited the dentist for pain and acute problems and 74 (24.4%) had visited the dentist for regular control. The impact of oral status on 8 aspects of daily performances might be considered as severe because 92% of adults reported one or more oral impacts in the 6 months preceding the survey. Adulyanon reported a prevalence of 73.6% in a Thai population which was in accordance to the present study. However, only 33% of the participants reported impact only on 1 or 2 performances in the study conducted by Gupta A and 50% patients reported at least one OIDP oral impact in the past 6 months in the study conducted by Srisilapanan. Tsakos G. reported a low prevalence in Greek population (39.1%) and British population (12.3%). Eating or speaking performances were most commonly affected in the present study; this further supports the view that the study population was more concerned about the interference in the physical activities. This finding was in accordance to the study conducted by Srisilapanan, Peker I and Tsakos G. In India, most adults (92%) retain at least 20 natural teeth with a prevalence rate of 19%. Considering that the OIDP score measures ultimate impacts of disability and handicap, the present estimate of the effect of dental and oral disorders on OHRQoL might be considered as serious. OHRQoL is affected by age, gender, socio-economic status and tooth loss. The present study revealed that statistically significant difference was found between number of missing teeth, gender, frequency of dental visits and self-reported oral health status. Around one third of the participants reported impact of very severe or severe intensity. Speaking and eating were the most severely affected daily performances. These findings highlight the importance of the physical aspects of the teeth and mouth on participants' lives. Dissatisfaction with eating and speaking properly is a major concern for the study population. The results are in accordance with other studies conducted by Gherunpong S et al. and Bernabe E et al.

Clinical parameters and all the three scales of OIDP (overall score, extent and intensity) presented similar correlation except that oro-facial pain was found to be significantly associated only to the extent score. Zeng et al. also reported similar correlations with all three OIDP scales.

Most of the present studies focus on adverse impacts of OHRQoL, additional methods are needed to capture positive dimensions of health. This is particularly important for tracking improvement amongst people who are initially free of any adverse symptoms. There is a need to identify additional determinants of OHRQoL, additional research is needed to evaluate the treatment of existing disease, its prevention, and enhancement of health. These studies should assess its evaluative properties to determine its applicability to support clinical measures in oral health care intervention research.

An interesting finding was that impacts relating to social and psychological dimensions, such as contact with people and maintaining usual emotional state were less common and least severe in this study. Subjects with missing teeth had a stronger interference with speaking, eating, smiling, and also carrying out proper social role. These findings can be explained as diseases does not always negatively affect subjective perceptions of health and well-being, and even when it does, its impact is influenced by other factors such as expectations, preferences, material, social and psychological resources, and more importantly, socially and culturally derived values.

The limitations being a cross-sectional study, the analytical capability is lower than that in other types of study designs, but it is very appropriate for the study of prevalence and for the initial indication of a possible cause-effect association. This study was limited by the inclusion of only one indicator of dental status in terms of self-reported number of missing teeth. Evidence suggests a close agreement between clinically recorded number of missing teeth in adults. Owing to the self-report method employed, the possibility that socially desired and undesired acts have been, respectively, over- and underestimated cannot be overlooked.

The present study supports earlier findings about strong inter-relationships among age, number of missing teeth and OHRQoL, supporting that both age and tooth status should be accounted for in analysis involving whole populations, as previously suggested. The results presented provide support of the discrepancy between reported dental status, as a measure for clinically determined dental problems, and OHRQoL. Although the number of missing teeth turned out to be one of

the most important predictors of the OIDP, socio–demographics and dental visiting habits explained a significant amount of its variance. In addition to the oral condition, the OIDP scores reflect individuals' tendency to complain because of their social and psychological situation.

Moreover, OIDP is based on individual's perception; hence the outcomes are very subjective and memory based. Therefore, there may be an underestimation of functional and psychosocial impact. Longitudinal approaches may yield different findings and can help to determine how the impact of oral conditions vary over time.

Intervention studies are needed to assess whether dental care reduces the impacts and affects quality of life. Moreover, it is recommended that appropriate policy changes should be made inorder to integrate oral health care into various ongoing programmes so that the QoL can be improved.

V. CONCLUSION

Oral conditions are known to affect various aspects of quality of life. The oral impacts affecting the performances and quality of life was found to be severe in the present study. The results showed that OHRQoL of a group of patients attending a dental institution is affected by a number of factors including socio-demographic factors, regular dental visit and number of missing teeth. In conclusion, a strong and consistent relationship between most of the clinical measures of oral health status and perceived impacts was observed. These findings have significant implications for employment of patient-centered outcome measures as objective clinical parameters of dental diseases in assessment, planning and provision of treatment, and subsequent evaluation of care. Professionals perhaps need to utilize this tool to evaluate if successful therapist-centered outcome co-relates with patient-centered outcome.

Reisine's words still holds the same importance – The social impact of oral disease and its policy implications deserve consideration by the health field. The greatest potential contribution of dentistry is in the ways it can affect the quality of life at the individual and the community level. Therefore, means must be promoted to demonstrate and measure such contributions in terms that policy makers, planners, administrators, and the public can understand.

REFERENCES

[1] Adulyanon, S. & Sheiham, A. (1997). Oral Impacts on Daily Performances. In Measuring oral health and quality of life (pp. 151-160). Slade GD. Chapel Hill: University of North Carolina.

[2] Adulyanon, S. Vourapukjaru, J. & Sheiham, A. (1996). Oral impacts affecting daily performance in a low dental disease Thai population. Community Dent Oral Epidemiol, 24(6),385-389.

[3] Srisilapanan, P. & Sheiham,A. (2001). The prevalence of dental impacts on daily performances in older people in Northern Thailand. The Gerodontology Association,18(2),102-108.

[4] Khairnar, MR. Wadgave, U. & Shimpi, V. (2016). Kuppuswamy's Socio-Economic Status Scale: A Revision of Occupation and Income Criteria for 2016. Indian J Pediatr, 1-4

[5] Gupta, A. Ankola, AV.& Hebbal, M. (2012). Prevalence, Intensity and Extent of Oral Impact on Daily Performances and their relationship to Oral health problems among rural females. International Journal of Collaborative Research on Internal Medicine & Public Health, 4(5), 459-477.

[6] Zeng, X. Sheiham, A. Bernabe, E. & Tsakos, G. (2010). Relationship between dental status and Oral Impacts on Daily Performances in older Southern Chinese people. J Public Health Dent, 70, 101-107.

[7] Pereira, KC. De Lacerda, JT. & Traebert, J. (2009). The oral impact on daily performances and self-reported quality of life in elderly people in Florianopolis, Brazil. Oral Health Prev Dent, 7, 163-72.

[8] Jung, SH. Ryu, JI. Tsakos, G. & Sheiham, A. (2008). A Korean version of the Oral Impacts on Daily Performances (OIDP) scale in elderly populations: validity, reliability and prevalence. Health Qual Life Outcomes, 6-17.

[9] Tsakos, G. Marcenes, W. & Sheiham, A. (2002). Cross-cultural differences in Oral Impacts on Daily Performance between Greek and British older adults. Community Dental Health, 18(4), 209-213.

[10] Peker, I. & Alkurt, MT. (2014). Oral Impacts on Daily Performance in Turkish Adults attending a Dental School. The Journal of Contemporary Dental Practice,15(1), 92-98.

[11] Gherunpong, S. Tsakos, G. & Sheiham, A. (2004). The prevalence and severity of oral impacts on daily performances in Thai primary school children. Health and Quality of Life Outcomes, 2,57-62.

[12] Bernabé, E. Mir, C. & Sheiham, A. (2007). Prevalence, intensity and extent of Oral Impacts on Daily Performances associated with self-perceived malocclusion in 11-12-year-old children. BMC Oral Health, 7(6).

[13] Heloe, LA. (1972). Comparison of dental health data obtained from questionnaires, interviews and clinical examination. Scand J Dent Res, 80, 495–499.

[14] Reisine, ST. (1984). Dental health and public policy: the social impact of dental disease. Am J Public Health,74, 27-30.