DOI: 10.7860/JCDR/2018/37063.12286

Original Article

Dentistry Section

Oral Impact on Daily Performance among School Teachers in Kanpur, India: A Cross-sectional Study

ANTIMA SAXENA[1], RAMESH NAGARAJAPPA[2], GAYATHRI RAMESH[3]

ABSTRACT

Introduction: Teachers are considered as a dynamic force of the school. Their educational experience and contact with students can actively contribute to student's health promotion provided their physical, psychological and social aspects are not affected.

Aim: To assess the prevalence of oral impacts on routine performances and to evaluate the relationship between OIDP (Oral Impact on Daily Performance) and clinical parameters among school teachers of Kanpur city, India.

Materials and Methods: A descriptive, cross-sectional study was conducted among 414 school teachers of Kanpur, India. Data were collected using OIDP questionnaire and clinical examination included the assessment of Dentition Status and Treatment Needs along with Community Periodontal Index as per the guidelines of World Health Organization. Chi-square, Student's t-test, Mann-Whitney U and regression analysis were used for statistical evaluation.

Results: The prevalence of oral impact reported was 38.6%. Items most commonly affected were eating and chewing food (16.2%) followed with cleaning teeth (9.2%). Dental caries prevalence was higher among males (mean DMFT = 2.98±2.66) which was statistically significant ($p<0.05$). Bivariate analysis showed a significance ($p<0.05$) amongst the participants who reported having at least one impact and presence of dental caries (85%), presence of periodontal pockets (51.2%) and loss of attachment (47.5%).

Conclusion: The prevalence of OIDP in this study was low and affected the participant's daily life chiefly through difficulty in eating and the most prevalent reported causes were tooth loss and toothache.

Keywords: Community Periodontal Index, Dentition Status and Treatment Needs, Oral health, Quality of life

INTRODUCTION

Oral health is an imperative aspect of quality of life but as oral diseases are not considered life threatening, they are the most neglected. However, they can affect the ability to eat, speak and socialise without active oral problems and contribute to ones' general well-being. Oral health helps people to perform their routine lives without any physical, psychological or social disruption [1].

Quality of life is concerned with "the degree to which a person enjoys the important possibilities of life" [2]. Now-a-days it is believed that disease measured by professionals is conceptually and empirically not the same as illness and health self-assessed by the participants. So, it is important to study the associations between oral health status measured by dental professionals and individual's insight of oral health and in addition oral health related quality of life. A socio-dental indicator was much needed to be developed which could measure the positive and negative changes in oral health [3].

The OIDP is comparatively a new indicator that attempts to measure oral impacts that affect the person's daily life. The OIDP is a short Oral Health Related Quality of Life (OHRQOL) instrument developed to measure oral impacts on physical, psychological and social aspects of an individual's daily life. This instrument is advantageous for use in population surveys, not only in terms of being easier but also being short [4]. OIDP 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 [4]. ICIDH offers empirical search of the associations between different dimensions or levels of outcome variables and comprise of following points; impairments, functional limitations, pain, discomfort, disability and handicap. OIDP scale has shown to have satisfactory psychometric properties when applied to adult population in Tanzania, Thailand, UK and Greece [5].

Indeed, many of the quality of life indicators in dentistry have focused mainly on older age groups, partly on the assumption that they would have had a lifetime's experience of oral diseases and thus are likely to perceive oral health as having a greater impact on their quality of life [6]. Assessing oral health related quality of life impact of mouth in school teachers is a relatively ignored area in dental research which is an important part of oral health needs assessment. School teachers have traditionally been considered as potentially important primary agents of socialisation, with a capability of influencing the future, knowledge, attitude and behaviour of school children. Further, they play important roles as models for the school pupils and are the fulcrum for the implementation of school based oral health programs [7,8]. Although, OHRQOL has been used in the past, to our knowledge there has been only one previously reported study on OIDP targeting teachers, in particular [9]. Hence, this study was conducted with the objectives of developing and testing the reliability and validity of Hindi version of Oral Impact on Daily Performance (OIDP), also to assess the prevalence of oral impact on daily performance and to evaluate the relationship between OIDP and clinical parameters among school teachers.

MATERIALS AND METHODS

A cross-sectional descriptive survey was conducted among school teachers of both genders of Kanpur city, India from February 2016 to June 2016 to assess the impact of oral health on their routine life. The study protocol was reviewed by the Ethical Committee and was granted ethical clearance (IEC/RDCHRC/2013-14/153). The procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000. A written informed consent was obtained from the enrolled participants in their spoken language.

Calibration procedures were performed in the Department of Public Health Dentistry prior to and during the study to ensure uniform interpretations, understanding and application of the codes and criteria for the diseases to be observed. Percentage agreement

for assessment of Dentition Status and Treatment needs and also Community Periodontal Index (CPI) was 90% and 84% respectively. Training of recording assistant for recording the codes was done to minimise any errors.

A pilot study was carried out among 42 teachers from four schools (English Medium and Hindi Medium) to determine the feasibility of the study using OIDP scale and to check its psychometric properties, validity and reliability of both Hindi and English forms in Kanpur city. Face and content validity were tested in the pilot study with regard to content, wording, scoring method and easiness and appropriateness of both the questionnaires administered (Hindi and English). Modifications required were done and the difficulties experienced were overcome by redesigning the proforma, which was later used for conducting the study. Depending on the prevalence of oral impacts reported with pilot study, the sample size of 403 was determined.

A two-stage random sampling technique was used for obtaining the required sample for the study. In the first stage, Kanpur city was divided into four zones. Eight schools were randomly selected from each zone using lottery method. In the second stage, all teachers from selected 32 schools were invited to participate in the study. Teachers present on the day of collection of data, provided written informed consent and were intellectually and physically capable of responding to the OIDP questionnaire [3] were included. Those who have visited the dentist in past six months, undergoing orthodontic treatment and suffering from any serious medical condition/systemic diseases were excluded from the study.

The sample size was calculated using Epi tools sample size calculator. Prevalence of oral impacts estimated from the pilot study was 39.1%. At a confidence level of 95% and desired precision of 5% the sample size was 366. To account for 10% expected non-response rate, we considered a total of 403 as the desired sample size.

The respective school authorities were requested to provide an area for examination with adequate illumination along with a table and couple of chairs. Examination was done by a single investigator who was assisted by a trained and co-operative recording assistant. Oral impacts of school teachers on their daily performances were collected by means of OIDP questionnaire [3]. Clinical parameters involved the assessment of Dentition Status and Treatment Needs along with Community Periodontal Index consistent with the guidelines of World Health Organization (1997) [10].

The theoretical framework of OIDP was modified from the World Health Organization's (WHO) International Classification of Impairments, Disabilities and Handicaps amended for dentistry by Locker [4]. The main modification was that different levels of consequence variables were established. The first level refers to the oral status, including oral impairments, which most clinical indices attempt to measure. The second level, "the intermediate impacts", includes the possible earliest negative impacts caused by oral health status: pain, discomfort or functional limitation. Dissatisfaction with appearance was added in this level since a study indicated that it was a major dimension of oral health outcomes [11].

In addition, functional limitation may cause pain, discomfort or dissatisfaction with appearance and vice versa. The third level or the "ultimate impacts" represents impacts on ability to perform daily activities which consists of physical, psychological and social performances. OIDP has nine items covering physical, psychological and social dimension of daily performances, but one of them (carrying out physical activities) is considered redundant, therefore excluded from the questionnaire.

Hindi version of the questionnaire was developed with the help of two native persons, a dental public health expert and a Hindi professor. In the first stage, the original English questionnaire was translated into Hindi language and a Hindi OIDP questionnaire was developed with an agreement among both dental public health expert and the Hindi professor. OIDP questionnaire (Hindi) was first tested on 10 school teachers and they were asked to give their feed-back regarding the questionnaire. Subsequently, all necessary corrections were made and a final Hindi version of OIDP questionnaire was developed which was further back translated into English language to verify the expression of the content of original questionnaire.

The score for the impact of oral health issues on each of the activities is obtained by multiplying the frequency and severity scores. The total score was the sum of all the performance scores for an individual. For the analysis purposes the score was dichotomized for the subjects who did not report any impact at all and the subjects who have reported at least one oral impact which affect/s their routine life in past six months.

The data obtained was compiled systematically, transformed from a filled proforma to excel sheet and a master chart was prepared. Statistical Package for Social Sciences (SPSS-version 21.0) was used to analyse the data. Descriptive statistics included calculation of percentages, means and Standard Deviation (SD). Data distribution was assessed for Normality using Shapiro-Wilk test and box-plots. Chi-square test was used for testing association between proportions. Student's t-test was applied for comparing significance of difference between means from parametric data and Mann-Whitney U test for non-parametric data. Logistic regression analysis was performed to identify relationship between OIDP scores and clinical oral examination variables. For all tests, confidence interval and p-value were set at 95% and <0.05 respectively.

RESULTS

The current study was conducted on 414 school teachers, among which 158 (38.2%) were males and 256 (61.8%) were females. Mean age of the participants was 40.5±11.14 years. Internal consistency reliability of OIDP items is shown in [Table/Fig-1]. The corrected item correlation ranged from 0.32-0.518 being above the minimum recommended level of 0.20 for inclusion of items in the scale and meeting the stringent criterion of item convergent validity of >0.40. The Cronbach's alpha of the scale was 0.76 with alpha values (if any item being deleted) lower than the original value. The present alpha value falls within the recommended minimum of 0.7 [10].

Performances	Corrected item total correlation	Alpha if item deleted
Eating and chewing food	0.518	0.762
Speaking and pronouncing clearly	0.500	0.721
Cleaning teeth	0.484	0.721
Sleeping and relaxing	0.473	0.722
Smiling, laughing and showing teeth without embarrassment	0.399	0.764
Maintaining usual emotional state	0.465	0.715
Carrying out major work or social role	0.347	0.715
Enjoying social contact	0.328	0.624
OIDP		**0.76**

[Table/Fig-1]: Internal consistency reliability of OIDP items among study participants.

[Table/Fig-2] shows the relationship between the presence of oral impact and socio-demographic characteristics of the participants. Females (57.5%) and married (62.5%) subjects revealed higher impact, but the difference was not statistically significant. Age, teaching experience and qualification of the study subjects presented a significant relationship (p<0.05).

Mean scores of overall impacts on daily performances was 2.04±1.85 [Table/Fig-3]. Difficulty in eating was the highest (0.65±0.25) reported impact and the lowest (0.06±0.21) was towards enjoying social contact with people. [Table/Fig-4] represents the distribution of study subjects according to prevalence of OIDP. Two hundred fifty four participants (61.4%) did not report any impact affecting their daily living as against 160 (38.6%) reported at least one impact. The

items most commonly affected by oral health status were eating and enjoying food (16.2%) followed with cleaning teeth (9.2%). Similarly, the least commonly affected were maintaining usual emotional status (3.4%) and enjoying social contact with people (2.7%).

[Table/Fig-5] shows the oral conditions perceived by the subjects and the frequency of each that causes impacts on the eight activities. Tooth loss (20.9%), toothache (17.9%) and bad breath (17.9%) were main causal symptoms of impact affecting the routine life of the participants. Eating was affected by tooth loss (25.4%) and toothache (26.9%). Cleaning mainly suffered due to bleeding gums (57.9%). Tooth mobility mainly caused difficulty in eating (8.9%) and cleaning teeth (15.8%) respectively. Spacing between teeth was causing difficulty with smiling, maintaining usual emotional state, carrying out social role and eating and chewing performances. Other impacts affecting the routine life reported by the participants were mal-aligned teeth, discoloured teeth, oral ulcers etc.

Mean DMFT of the study population was 2.98±2.66 [Table/Fig-6], which was higher among males (3.51±2.92) than females (2.65±2.44). This difference observed was statistically significant (p<0.05). According to the age group, though dental caries prevalence was found to be higher in the elderly age groups, >60 years (6.90±5.37 in males and 4.00±4.21 in females) it was statistically not significant.

[Table/Fig-7] presents the prevalence of periodontal disease conditions among study subjects by gender and age. Only 7.6% males and 12.9% females had a healthy periodontium. Majority was suffering from bleeding gums (43.7% males; 44.1% females) followed by shallow pockets (25.9% males; 19.5 females) but the difference observed was not statistically significant. According to age, deep pockets were seen to be higher in both the elderly age groups 51-60 and >60 years (22.2% males; 8.6% females and 27.3% males and none of the females) respectively which showed a significant variance (p<0.05).

The prevalence of Loss of Attachment (LOA) was (27.3%) with none of the subjects showing LOA more than 12 mm [Table/Fig-8]. It decreased with increasing LOA scores. No statistically significant difference was observed by gender but LOA of 4-5 mm was

Demographic characteristics	No impact (254) n (%)	Having one or more oral impact (160) n (%)	chi-square value	p-value
Sex Males (n=158) Females (n=256)	 90 (35.4) 164 (64.6)	 68 (42.5) 92 (57.5)	2.077	0.149
Age (in years) 21-30 (n=89) 31-40 (n=93) 41-50 (n=123) 51-60 (n=88) > 60 (n=21)	 43 (16.9) 63 (24.8) 77 (30.3) 56 (22.0) 15 (5.9)	 46 (28.8) 30 (18.8) 46 (28.8) 32 (20.0) 6 (3.8)	9.155	0.05*
Teaching experience -1-5 years -5-10 years -10-15 years -15-20 years -20 or more years	 34 (13.4) 38 (15.0) 49 (19.3) 30 (11.8) 103 (40.6)	 36 (22.5) 32 (20.0) 40 (25.0) 15 (9.4) 37 (23.1)	17.136	0.002*
Marital status -Unmarried -Married -Separated	 52 (20.5) 157 (61.8) 45 (17.7)	 40 (25.0) 100 (62.5) 20 (12.5)	2.614	0.271
Qualification -Graduate -Post Graduate	 137 (53.9) 117 (46.1)	 61 (38.1) 99 (61.9)	9.836	0.002*

[Table/Fig-2]: Relationship between impact (present/absent) and socio demographic variables.
Test used-chi square test; * statistically significant value (p<0.05)

Items	Mean	SD	Range
Performances	2.04	1.85	0-20
Eating and chewing food	0.65	0.25	0-15
Speaking and pronouncing clearly	0.26	0.14	0-8
Cleaning teeth	0.25	0.15	0-6
Sleeping and relaxing	0.11	0.56	0-4
Smiling, laughing and showing teeth without embarrassment	0.32	0.65	0-15
Maintaining usual emotional state	0.20	0.11	0-15
Carrying out major work or social role	0.19	0.09	0-5
Enjoying Social contact	0.06	0.21	0-4

[Table/Fig-3]: Distribution of mean scores of individual oral performances affecting the overall impact on the oral health.

Items	No n (%)	Yes n (%)
Overall impact	254 (61.4)	160 (38.6)
Eating and chewing food	347 (83.8)	67 (16.2)
Speaking and pronouncing clearly	391 (94.4)	23 (5.6)
Cleaning teeth	376 (90.8)	38 (9.2)
Sleeping and relaxing	390 (94.2)	24 (5.8)
Smiling, laughing and showing teeth without embarrassment	390 (94.2)	24 (5.8)
Maintaining usual emotional state	400 (96.6)	14 (3.4)
Carrying out major work or social role	383 (92.5)	31 (7.5)
Enjoying social contact	403 (97.3)	11 (2.7)

[Table/Fig-4]: Prevalence of individual oral performances affecting the overall oral health of the study participants.

Daily Performances	Frequency of difficulty with daily performance in last six months	Toothache n (%)	Bad breath n (%)	Bleeding gums n (%)	Tooth loss n (%)	Tooth mobility n (%)	Abscess n (%)	Spacing n (%)	Other n (%)
Eating and chewing food	67 (28.6)	18 (26.9)	2 (3)	2 (3)	17 (25.4)	6 (8.9)	20 (29.8)	2 (3)	0
Speaking and pronouncing clearly	23 (9.8)	2 (8.7)	6 (26.1)	0	3 (13)	0	4 (17.4)	0	8 (34.8)
Cleaning teeth	38 (16.2)	2 (5.3)	0	22 (57.9)	4 (10.5)	6 (15.8)	4 (10.5)	0	0
Sleeping and relaxing	24 (10.3)	18 (75)	2 (8.3)	0	0	0	0	0	4 (16.7)
Smiling, laughing and showing teeth without embarrassment	24 (10.3)	0	3 (12.5)	0	10 (41.7)	0	0	4 (16.7)	7 (29.2)
Maintaining usual emotional state	14 (6)	0	3 (21.4)	0	5 (35.7)	3 (21.4)	0	3 (21.4)	0
Carrying out major work or social role	31 (13.2)	0	19 (61.3)	4 (12.9)	6 (19.4)	0	0	2 (6.5)	0
Enjoying social contact	13 (5.6)	2 (15.4)	7 (53.8)	0	4 (30.8)	0	0	0	0
Total	234 (100)	42 (17.9)	42 (17.9)	28 (12)	49 (20.9)	15 (6.4)	28 (12)	11 (4.7)	19 (8.1)

[Table/Fig-5]: Frequency distribution of perceived causes for the Oral Impact on Daily Performances of the study participants.

Age groups (years)	Gender (n)	DMFT (Mean±S.D)	z-statistic	p-value
21-30	Males (38) Females (51)	3.13±1.81 3.29±2.43	-0.333	0.7395
31-40	Males (44) Females (49)	2.81±2.42 2.38±2.49	1.130	0.2584
41-50	Males (47) Females (76)	3.40±3.03 2.38±2.14	1.767	0.0772
51-60	Males (18) Females (70)	4.22±2.31 2.47±2.33	2.592	0.0095*
>60	Males (11) Females (10)	6.90±5.37 4.00±4.21	0.902	0.3671
Total	Males (158) Females (256)	3.51±2.92 2.65±2.44 2.98±2.66	2.917	0.0035*
414				

[Table/Fig-6]: Distribution of study population by age and gender according to mean DMFT scores.
Test used -Mann-Whitney U test * statistically significant value (p<0.05)

higher among the females (18.8%) as compared to males (24.1%). Amongst the total subjects, prevalence of LoA was found highest amongst the participants of 41-50 years of age group, mainly in females (36.8%).

Bivariate analysis [Table/Fig-9] revealed that the self-reported oral impacts from the participants were significantly associated (p<0.05) with those who were diagnosed with presence of dental caries (85%), periodontal pockets (51.2%) and Loss of Attachment (47.5%). Multivariate logistic regression analysis [Table/Fig-10] illustrates that the odds of having an impact were about ten times more for the subjects with caries as compared to those without caries (OR 10.3, 95% CI: 5.9- 17.7, p<0.05). Loss of Attachment was also a significant predictor of having an impact (OR 0.14, 95% CI: 0.05-0.35, p<0.05). Periodontitis was not a significant predictor for having an oral impact (OR=1.3, CI: 0.6-1.7, p>0.05).

Age groups (years)	Gender	Healthy n (%)	Bleeding n (%)	Calculus n (%)	Shallow pockets n (%)	Deep pockets n (%)	Chi-square value	p-value
21-30	M (38) F (51)	2 (5.3) 11 (21.6)	21 (55.3) 22 (43.1)	0 (0) 2 (3.9)	12 (31.6) 6 (11.8)	3 (7.9) 10 (19.6)	12.389	0.015*
31-40	M (44) F (49)	2 (4.5) 5 (10.2)	24 (54.5) 27 (55.1)	3 (6.8) 3 (6.1)	12 (27.3) 12 (24.5)	3 (6.8) 2 (4.1)	1.779	0.879
41-50	M (47) F (76)	5 (10.6) 14 (18.4)	14 (29.8) 20 (26.3)	8 (17.0) 11 (14.5)	13 (27.7) 18 (23.7)	7 (14.9) 13 (17.1)	1.657	0.799
51-60	M (18) F (70)	2 (11.1) 3 (4.3)	3 (16.7) 44 (62.9)	5 (27.8) 4 (5.7)	4 (22.2) 13 (18.5)	4 (22.2) 6 (8.6)	16.517	0.006*
>60	M (11) F (10)	1 (9.1) 0 (0)	7 (63.6) 0 (0)	0 (0) 9 (90.0)	0 (0) 1 (10)	3 (27.3) 0 (0)	21.000	<0.001*
Total	M (158) F (256)	12 (7.6) 33 (12.9)	69 (43.7) 113 (44.1)	16 (10.1) 29 (11.3)	41 (25.9) 50 (19.5)	20 (12.7) 31 (12.1)	5.688	0.459

[Table/Fig-7]: Distribution of the study participants according to their periodontal status by gender and age.
Test used – Chi-square test * statistically significant value (p<0.05)
M – Males, F - Females

Age groups (years)	Gender	0 n (%)	1 n (%)	2 n (%)	3 n (%)	4 n (%)	X	9	Chi-square value	p-value
21-30	M (38) F (51)	24 (63.2) 37 (72.5)	13 (34.2) 11 (21.6)	1 (2.6) 3 (5.8)	0 (0) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	2.0827	0.353
31-40	M (44) F (49)	34 (77.2) 38 (77.5)	8 (18.1) 11 (22.5)	2 (4.5) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	2.4341	0.296
41-50	M (47) F (76)	35 (74.5) 48 (63.2)	11 (23.4) 16 (21.1)	1 (2.1) 11 (14.5)	0 (0) 1 (1.3)	0 (0) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	5.7793	0.123
51-60	M (18) F (70)	13 (72.2) 55 (78.6)	5 (27.8) 10 (14.3)	0 (0) 4 (5.7)	0 (0) 1 (1.4)	0 (0) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	2.8895	0.409
>60	M (11) F (10)	7 (63.6) 10 (100)	1 (9.1) 0 (0)	0 (0) 0 (0)	3 (27.2) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	4.4920	0.106
Total	M (158) F (256)	113 (71.5) 188 (73.4)	38 (24.1) 48 (18.8)	4 (2.5) 18 (7.0)	3 (1.9) 2 (0.8)	0 (0) 0 (0)	0 (0) 0 (0)	0 (0) 0 (0)	6.1035	0.107

[Table/Fig-8]: Distribution of the study participants according to the loss of attachment of gingiva by gender and age.
Test used – Chi-square test * statistically significant value (p<0.05)
M – Males, F - Females
LoA Coding: 0= Pocket depth 0-3 mm; 1= Pocket depth 4-5 mm; 2= Pocket depth 6-8 mm; 3= Pocket depth 9-11 mm and 4= Pocket depth 12 mm

Clinical indicators	No impact (254) n (%)	Having one or more oral impact (160) n (%)	Chi-square value	p-value
Dental caries Absent Present	 163 (64.2%) 91 (35.8%)	 24 (15.0%) 136 (85.0%)	95.839	<0.001*
Periodontal disease Absence of Pockets Presence of Pockets	 194 (76.4%) 60 (23.6%)	 78 (48.2%) 82 (51.2%)	33.250	<0.001*
Loss of Attachment Absent Present	 217 (85.4%) 37 (14.6%)	 84 (52.5%) 76 (47.5%)	53.650	<0.001*

[Table/Fig-9]: Bivariate analysis of relationship between having any oral impact on daily performance and clinical dental status.
Test used-Chi-square test * statistically significant value (p<0.05)

Clinical indicators	Adjusted OR	95% Confidence Interval	p-value
Caries prevalence -Present /Absent	10.3	5.9-17.7	<0.001*
Periodontitis -Present/ Absent	1.3	0.6-1.7	0.477
Loss of attachment -Present/ Absent	0.14	0.05-0.35	<0.001*

[Table/Fig-10]: Multivariate logistic regression considering association between the dependent variable (OIDP) and clinical status.

DISCUSSION

An important attribute of any psychometric instrument is its ability to measure what 'it intends to measure in a meaningful and useful

way' [12]. The adaptation and validation process of Hindi version of OIDP in the present study population followed the recommended stages to evaluate the reliability and validity of psychometric scales and indices. In the present study, construct validity was gauged by comparing the overall scores of the OIDP with the level of satisfaction with oral health. The results that showed a gradient in relation to the levels of the OIDP scores supported the construct validity of the instrument.

One important step in the process of the psychometric evaluation of a scale is the test of its internal consistency. As for interim correlation, a desirable moderate correlation [13] was observed for most items of this study. Cronbach's alpha coefficient frequently used to describe the internal consistency of a scale was estimated as 0.76. Similar results were obtained by Abegg C et al., in Brazil, Adulyanon S et al., in Thailand and Tsakos G et al., in a British sample [12,14,15]. However, this value was lower when compared with that reported as 0.82 by Eric J et al., in Bosnia [16].

In the present study, 38.6% school teachers reported impacts on daily activities in last six months that was similar to the findings of Lawal FB et al., and Tsakos G et al., where 39.1% and 36.2% participants reported the impact respectively [9,17]. Higher prevalence of OIDP have also been observed in other studies in which the reason may be attributed to that these studies were conducted upon older age group people specifically, who generally have more of oral problems [2,11,15,17-20]. Other reason may also be the study population involves the school teachers, who are the society's qualified cohort and are aware of the health issues and take daily care of their oral health problems.

Around two-third of the participants, reported impact only on one or two performances. Consistent with the results found in previous OIDP surveys [18-20], difficulty in eating, cleaning teeth and smiling were the impacts most frequently noted. The reasons perceived by majority of the subjects were tooth loss, toothache, abscess, bleeding gums, bad breath etc., approximating with the findings of Adulyanon S et al., [21]. Performances such as maintaining usual emotional balance (3.4%) and enjoying social contact (2.7%) were affected less frequently which is consistent with the findings of Astrom AN et al., [22].

In relation to the prevalence of individual impact items, it was evident that the most commonly experienced impact item was 'difficulty in eating and chewing food' (16.2%) which is pertinent to the findings of the study conducted by Sheiham et al., Lawal FB et al., Astrom AN et al., and Jung SH et al., [2,9,22,23]. However, this prevalence was less as compared to prevalence obtained in the study conducted by Zeng X et al., among Southern Chinese people where the prevalence of oral impact related with eating was reported as 56.7% [18].

Other oral performances reported in this study affected by oral health status followed by 'Eating' were 'Cleaning teeth', 'Carrying out work', Sleeping and Relaxing', 'Smiling' and 'Speaking and Pronouncing words'. The least common problems were 'Maintaining emotional balance' and 'Enjoying Social contact'. A study conducted by Lawal FB et al., on school teachers Astrom AN et al., on Norwegian adults and also reported cleaning teeth was one of the most frequently reported and enjoying social contact was the least reported oral performance which may affect the routine life of individuals [9,24].

In the present study, the major causes of impacts affecting the daily performances of school teachers were reported as tooth loss (20.9%) followed by toothache and bad breathe (17.9% each). Other reported causes were bleeding gums, abscess, tooth mobility, spacing etc. These findings are in accordance with the studies conducted earlier [21,22,25,26] where they observed the similar causes affecting the daily life of individuals frequently. Bad breath was majorly reported to cause an impact on 'carrying out major or social role' which is in accordance with the study conducted by Adulyanon S et al., [21].

Caries prevalence in the present study was 85% (Mean 2.98±2.66), coinciding with majority of the studies reported [11,17,21,27]. The prevalence was higher compared with the studies conducted by Jung SH et al., where the prevalence of dental caries was found to be 36.4% and Andersson P et al., amongst the participants of Sweden (46.7%) [23,28]. This high caries experience may be attributed to factors such as no regular dental visits, not brushing regularly and not maintaining good oral health. In contrast, Astrom AN et al., reported a higher prevalence of decayed teeth (77%) among Uganda adolescents [3].

Gender is also shown to have an independent influence, which is inconsistent with the findings of other studies [29]. Comparison based on gender showed that males had significantly more severe caries than females. However, these influences are not consistent; sometimes girls show higher impact of oral disease on their daily lives, sometimes boys show greater impact. Explanations for these gender differences are not conclusive; it is argued that boys are more active than girls and regular physical activity has been associated with a better perception of health; on the other hand, being female is associated with a greater awareness of the mouth and possible oral problems.

Untreated dental caries was found to be a strong indicator of high impact on daily performances (OR=10.3) corroborating with previous studies conducted by Gomes AS et al., and Nagarajappa R et al., where they found the odds of relationship between dental caries and OIDP as OR=5.3 and 4.225 [1,30]. The reason could be attributed to dental pain resulting from dental caries, a finding observed in a similar study [31]. Cleaning, sleeping and relaxing were the most frequently affected performances (OR=2.487, 8.996) as a consequence of caries substantiated by another study in which sleeping and cleaning performances were associated with pain resulting from tooth decay [32].

In the present study, 89.1% of participants experienced various forms of periodontal disease. Majority of them had bleeding (44%) and shallow pockets (22%) which are analogous to those obtained by Leao AT et al., [27]. Consistent with the findings reported previously [9], pockets were evident only in 34.3% of the subjects. Females were periodontally weaker as compared to males but these findings were not statistically significant. The reason why gender affects periodontal health status may be attributed to the habit and consciousness of females in maintaining their regular dental visit and stress which is a factor associated with periodontal health. Wandera MN et al., validated to non significant associations between OIDP and CPI and pertaining to individual item, between cleaning teeth (OR=1.164) performance and clinical periodontal status [33]. This could be due bleeding gums as perceived by majority (43.96%) of the teachers. In another study, cleaning teeth was impacted chiefly by gum abscess (28.6%), toothache (23.3%) and oral ulcer (12.6%) [21].

An approximating frequency of attachment loss (27.3%) observed was similar to earlier study [18]. Age related increase in attachment loss is in agreement with the general trend observed [34]. The strong association between age and periodontal destruction is mostly due to the effect of age as surrogate for the length of exposure to aetiologic factors. Periodontal disease impacted negatively on OHRQoL in adults. A correlation between extent and/or severity of periodontal disease and poorer OHRQoL has been demonstrated in several studies [35,36]. The present study depicted significant impact of loss of attachment on the performances (OR=0.14) which is in conformity with the results obtained by Ng and Leung (2006) [34], where significant impact was observed, whereas the studies conducted by Nagarajappa R et al., and Needleman I et al., reported the results in contrast [30,37]. Disease does not always negatively affect subjective perceptions of well-being, and when it does; its impact is influenced by the nature of the disease as well as expectation, preferences and financial, social and psychological resources [17].

In the present study all the clinical parameters were found to be significantly associated with OIDP scores. Participants who reported oral impact were found to have clinical conditions in higher frequencies as compared to those who did not. The findings of our study are similar to the findings concluded by Nagarajappa R et al., where they found a significant association between the dental caries, CPI score and participants who reported impact [30]. Teachers with dental caries and compromised periodontal conditions were more likely to report impact of their oral health on their routine life. The reason for this could be because these conditions cause severe pain and draw the attention of the individuals when at their severe stage.

We observed a strong and consistent relationship between most of the clinical measures of oral health status and perceived impacts in school teachers. These conclusions have significant consequences for the 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 utilise this tool to evaluate if successful therapist-centred outcome co-relates with patient-centred outcome. Greater understanding of the difference in oral health that exists between healthy versus compromised patients beyond clinical parameters is important because it will provide an insight into the consequences of dental diseases for patient's daily life and QoL, as well as illustrating the need for addressing these disparities. The main disadvantage of the OIDP is that it has to be self-reported and common persons' judgement whose opinion may differ from the clinician point of view.

LIMITATION

The main limitation of the present study is its cross-sectional nature which poses problems in relation to hypothesis testing since data on risk factors and outcome are assessed at the same time, but this particular issue does not seem to affect our result. Also, self-reported bias may have been introduced which may be dealt with, if the data was collected by conducting interviews to obtain actual responses by the participants.

Longitudinal studies are needed to better understand and interpret OHRQOL measures in teachers. Further research is also recommended to assess whether the measure of oral health-related quality of life as a patient-centred outcome is sensitive to changes in clinical dental status over time and also at the level of individual.

CONCLUSION

The OIDP instrument in this study showed acceptable psychometric properties and is considered a valid, reliable and practical tool for use among School teachers of Kanpur city, India. The results exhibit an overall assessment of oral health and its related conditions in the study sample. The pattern and distribution of epidemiological studies similar to our study seek to advocate that strategies need to be planned for the improvement of oral health of the population. Also, this instrument can be used in integration with the clinical measures to provide more effective treatment to the patients by analysing the impact of oral conditions on the daily lives of patients..

REFERENCES

[1] Gomes AS, Abegg C, Guimaraes-Fachel JM. Relationship between oral clinical conditions and daily performances. Braz Oral Res. 2009;23(1):76-81.
[2] Sheiham A, Steele JG, Marcenes W, Tsakos G, Finch S, Walls AWG. Prevalence of impacts of dental and oral disorders and their effects on eating among older people; a national survey in Great Britain. Community Dent Oral Epidemiol. 2001;29(3):195-203.
[3] Astrom AN, Okullo I. Validity and reliability of the Oral Impacts on Daily Performances (OIDP) frequency scale: a cross-sectional study of adolescents in Uganda. BMC Oral Health. 2003;3(1):05-14.
[4] Locker D. Measuring oral health: A conceptual framework. Community Dent Health. 1988;5:03-18.
[5] Soe KK, Gelbier S, Robinson PG. Reliability and validity of two oral health related quality of life measures in Myanmar adolescents. Community Dent Health. 2004;21(4):306-11.
[6] Montero J, Lopez JF, Galindo MP, Vincente P, Bravo M. Impact of prosthetic status on wellbeing: a cross-sectional cohort study. J Oral Rehabil. 2009;36(8):592-600.
[7] Gill P, Chestnutt IG, Channing D. Opportunities and challenges to promoting oral health in primary schools. Community Dent Health. 2009;26:188-92.
[8] Stokes E, Pine CM, Harris RV. The promotion of oral health within the Healthy School context in England: a qualitative research study. BMC Oral Health. 2009;9:03.
[9] Lawal FB, Taiwo JO, Oke GA. Impact of Oral Health on the Quality of Life of Elementary School Teachers. Ethiop J Health Sci. 2015;25(3):217-24.
[10] Oral Health Surveys, Basic methods. Fourth edition, World Health Organization, Geneva, 1997.
[11] Tsakos G, Marcenes W, Sheiham A. Relationship between clinical dental status and oral impacts in an Elderly population. Oral Health Prev Dent. 2004;2(3):211-20.
[12] Abegg C, Fontanive VN, Tsakos G, Davoglio RS, de Oliveira MMC. Adapting and testing the oral impacts on daily performances among adults and elderly in Brazil. Gerodontology. 2015;32:46-52.
[13] Streiner DL, Norman GR. Health Measurement Scales, a Practical Guide to Their Use and Development. 2nd edn. Oxford: Oxford University Press, 2006.
[14] Adulyanon S, Sheiham A. Oral impacts on daily performances. In: Slade GD, ed. Measuring Oral Health and Quality of Life. Chapel Hill: University of North Carolina: Dental Ecology, 1997: 151-60.
[15] Tsakos G, Marcenes W, Sheiham A. Evaluation of a modified version of the index of oral impacts on daily performances (OIDP) in elderly populations in two European Countries. Gerodontology. 2001;18:121-30.
[16] ErićJ, StanđćI, SojićLT, JelenkovićPopovac A, Tsakos G. Validity and reliability of the oral impacts on daily performance (OIDP) scale in the elderly population of Bosnia and Herzegovina. Gerodontology 2012;29:e902-08.
[17] Tsakos G, Steele JG, Marcenes W, Walla AWG, Sheiham A. Clinical correlates of oral health-related quality of life: evidence from a national sample of British older people. Eur J Oral Sci. 2006;114(5):391-95.
[18] Zeng X, Sheiham A, Bernabe E, Tsakos G. Relationship between dental status and oral impacts on daily performances in older southern Chinese people. J Public Health Dent. 2010;70(2):101-07.
[19] Bjelovic L, Eric J, Stojanovic N, Krunic J, Cicmil S, Kanjevac T. Validation of the Child Oral Impact on Daily Performance Index among school children in Bosnia and Herzegovina: A pilot study. Med Pregl. 2017;LXX (1-2):12-17.
[20] Lazrak L, Bourzgui F, Serhier Z, Diouny S, Othmani MB. Crosscultural translation and adaptation of the Moroccan version of the child-oral impacts on daily performance 11-14 oral health-related quality of life. J Int Oral Health. 2017;9:236-41.
[21] Adulyanon S, Vourapukjaru J, Sheiham A. Oral impacts affecting daily performance in a low dental disease Thai population. Community Dent Oral Epidemiol. 1996;24(6):385-89.
[22] Astrom AN, Haugejorden O, Skaret E, Trovik TA, Klock KS. Oral impacts on daily performance in Norwegian adults: validity, reliability and prevalence estimates. Eur J Oral Sci. 2005;113(4):289-96.
[23] Jung SH, Ryu JI, Tsakos G, Sheiham A. A Korean version of the Oral Impacts on Daily Performances (OIDP) scale in elderly populations: Validity, reliability and prevalence. Health Qual Life Outcomes. 2008;27(6):17-25.
[24] Astrom AN, Haugejorden O, Skaret E, Trovik TA, Klock KS. Oral impacts on Daily Performances in Norwegian adults: the influence of age, number of missing teeth, and socio-demographic factors. Eur J Oral Sci. 2006;114(2):115-21.
[25] Glucan F, Nasir E, Ekback G, Ordell S, Astrom AN. Change in Oral Impacts on Daily Performances (OIDP) with increasing age: testing the evaluative properties of the OIDP frequency inventory using prospective data from Norway and Sweden. BMC Oral Health 2014;14:59.
[26] Amalia R, Schaub RMH, Stewart RE, Widyanti N, Groothoff JW. Impact of school-based dental program performance on the oral health-related quality of life in children. J Inv Clin Dent. 2017;8:e12179.
[27] Leao ATT, Sheiham A. Relationship between clinical dental status and subjective impacts on daily living. J Dent Res. 1995;74(7):1408-13.
[28] Andersson P, Hakeberg M, Karlberg G, Ostberg AL. Clinical correlates of oral impacts on daily performances. Int J Dent Hyg. 2010;8(3):219-26.
[29] Castro RAL, Portela MC, Leão AT, de Vasconcellos MT. Oral health-related quality of life of 11- and 12-year-old public schoolchildren in Rio de Janeiro. Community Dent Oral Epidemiol. 2011;39:336-44.
[30] Nagarajappa R, Batra M, Sanadhya S, Daryani H, Ramesh G. Relationship between oral clinical conditions and daily performances among young adults in India-A cross sectional Study. J Epidemiol Glob Health. 2015;5:347-57.
[31] Mashoto KO, Astrom AN, David J, Masalu JR. Dental pain, oral impacts and perceived need for dental treatment in Tanzanain school students: a cross-sectional study. Health Qual Life Outcomes. 2009;7:73-82.
[32] Ababneh KT, Faisal Abu Hwaij ZM, Khader YS. Prevalence and risk indicators of gingivitis and periodontitis in a Multi-Centre study in North Jordan: a cross sectional study. BMC Oral Health. 2012;12:01-08.
[33] Wandera MN, Engebretsen IM, Rwenyonyi CM, Tumwine J, Astrom AN, and the PROMISE-EBF study group. Periodontal status, tooth loss and self-reported periodontal problems effects on oral impacts on daily performances, OIDP, in pregnant women in Uganda: a cross-sectional study. Health Qual Life Outcomes. 2009;7(1):89-99.
[34] Ng SKS, Leung WK. Oral health-related quality of life and periodontal status. Community Dent Oral Epidemiol. 2006;34(2):114-22.
[35] Shanbhag S, Dahiya M, Croucher R. The impact of periodontal therapy on oral health-related quality of life in adults: a systematic review. J Clin Periodontol. 2012;39(8):725-35.

[36] Donaldson SI, Vallone EJ. Understanding self-reporting bias in organizational behavior research. J Bus Psycol. 2002;17(2):245-60.

[37] Needleman I, Mc Grath C, Floyd P, Biddle A. Impact of oral health on the life quality of periodontal patients. J Clin Periodontol. 2004;31(6):454-57.

PARTICULARS OF CONTRIBUTORS:
1. Senior Lecturer, Department of Public Health Dentistry, Institute of Dental Sciences, Siksha 'O' Anusandhan (Deemed to be University), Kalinganagar, Bhubaneswar, Odisha, India.
2. Professor and Head of Department, Department of Public Health Dentistry, Institute of Dental Sciences, Siksha 'O' Anusandhan (Deemed to be University), Kalinganagar, Bhubaneswar, Odisha, India.
3. Associate Professor, Department of Dentistry, Chamarajanagara Institute of Medical Sciences, Chamarajanagara, Karnataka, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Ramesh Nagarajappa,
Professsor and Head, Department of Public Health Dentistry, Institute of Dental Sciences,
Siksha 'O' Anusandhan (Deemed to be University), Kalinganagar, Bhubaneswar-751003, Odisha, India.
E-mail: rameshpcd@yahoo.co.in

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **May 07, 2018**
Date of Peer Review: **Jul 12, 2018**
Date of Acceptance: **Jul 31, 2018**
Date of Publishing: **Nov 01, 2018**