10.5005/jp-journals-10015-1208
ORIGINAL RESEARCH

Oral Health-related Quality of Life and Associated Factors in National Cadets Corps of Udupi District, India

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ABSTRACT

Objective: To assess the oral impact on daily performances (OIDP) and to study the inter-relationship between OIDP, dental attendance, socioeconomic status and caries experience among children enrolled in the National Cadets Corps (NCC).

Materials and methods: A cross-sectional survey of 389 male NCC cadets in the age group of 13 to 15 years was done. Child version of Oral Impacts on Daily Performances questionnaire (Child-OIDP) was used to assess the quality of life. Information on demographic correlates and oral health behavior was obtained through self-administered questionnaire. The cadets were clinically examined for caries using decayed, missing and filled tooth index (DMFT).

Results: A total of 359 children completed all the stages of the survey. The mean age of children was 13.96 ± 0.6 years. Fifty-five percent of the participants experienced at least one impact in the last 3 months. The mean OIDP score for the population was 12.13 ± 5.85. The most prevalent impact was 'difficulty in eating' (37%) and the least affected daily performance was social contact (17%). Dental attendance and caries experience showed significant positive correlation with all the impacts and the overall OIDP score. Hierarchical multiple regression analysis showed significant influence of dental attendance and caries experience on OIDP.

Conclusion: The study revealed that oral health has significant impact on quality of life of Indian children.

Keywords: Oral health, Quality of life, Adolescents, Caries, India.

How to cite this article: Pentapati KC, Acharya S, Bhat M, Rao SVK, Singh S. Oral Health-related Quality of Life and Associated Factors in National Cadets Corps of Udupi District, India. World J Dent 2013;4(2):81-85.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

Oral diseases are the most common chronic diseases. They are of considerable public health concern because of their prevalence, the high expense of their treatment and their impact on the individuals and society. The determinants of oral diseases are known. They are the risk factors common to a number of chronic diseases: Diet and dirt (hygiene), smoking, alcohol, risky behaviors causing injuries and stress. Although common oral diseases are not life-threatening, their outcomes may influence the overall well-being of individuals and populations.[1] Clinical parameters which are used in assessing oral health are mouth centered and rely on dental professionals' judgments. Although informative, they have been criticized because of their limited focus in terms of failing to consider functional and psychosocial aspects of oral health.

Existing literature has identified oral health-related quality of life (OHRQoL) as a multidimensional construct containing physical, social and psychological domains. It was also recognized that children can give valid and reliable information using appropriate questionnaires and thus should be the primary source of information regarding their OHRQoL. Currently, there are four questionnaires in the literature specifically directed at the child-adolescent population: The child perception questionnaire (CPQ11-14), the Michigan OHRQoL, the child-oral impact on daily performance (Child-OIDP) and the child oral health impact profile (COHIP). To date Child-OIDP index has been validated in Thailand,[2] France,[3] United Kingdom,[4] Peru[5] and Brazil.[6]

The present study was done on the male junior division of National Cadets Corps (NCC), the reserve defense forces of India. This division comprised of children from various private and government schools in Udupi district, Karnataka. The aim of the NCC training is to develop qualities of character, courage, comradeship, discipline, leadership, secular outlook, spirit of adventure and sportsmanship and the ideals of selfless service among the youth to make them useful citizens. To achieve their goals and become a successful human being in every aspect of life, good oral health is indispensable. Various studies have been conducted in Armed forces,[7] Naval recruits[8] and NCC[9] of developed and developing countries which are based mainly on clinical criteria. But no studies were reported in adolescents and NCC using the QoL measures. The concept of OHRQoL suggests that normative measures should be supplemented with physical, social and psychological domains. This study provided the opportunity to test the objective of assessing the OIDP, caries experience and their inter-relationship with various sociodemographic factors among children attending the NCC training camp.

MATERIALS AND METHODS

The study population in this cross-sectional study comprised of cadets attending their annual training camp from various schools of Udupi district. A total of 389 cadets, aged 13 to

15 years were invited to participate in the study. This study was approved by the institutional review board, Manipal University. Verbal consent was obtained from the cadets and written permission letter was obtained from Naval Commanding Officer.

Linguistic validation of the Child-OIDP questionnaire was done as described by Acquadro et al.[10] In the first step, the OIDP questionnaire was independently translated into Kannada, by two qualified English-to-Kannada translators. After a group discussion with the translators and one author (Shashidhar Acharya), the first consensus Kannada OIDP was backward translated to English. The backward translation was compared with the original questionnaire and the first consensus Kannada OIDP. A pilot study was carried out to validate all the items in the questionnaire before using them in the main survey. The self-administered questionnaire also consisted of demographic information, such as age, parent's education, parent's occupation, monthly income and oral health related behaviors. Parent's education, parent's occupation, monthly income were assigned values using modified Kuppuswamy scale to compile the socioeconomic status of the cadets into upper, middle and lower classes.[11]

The participants of this study were able to respond to the questions and had no difficulty in understanding both the content of the questionnaire and any specific words in particular. The Child-OIDP frequency index referred to difficulty carrying out eight daily life activities namely: Eating and enjoying food, speaking and pronouncing clearly, cleaning teeth, sleeping and relaxing, smiling and showing teeth without embarrassment, maintaining usual emotional state, carrying out major work and social role and enjoying contact with people. Each question was assessed using a 5-point Likert scale as never affected, less than once a month, once or twice a week, 3 to 4 times a week and every/nearly every day. The total Child-OIDP score was constructed by adding the 8 performance scores as scored 1 to 5 into a Child-OIDP additive score (OIDP add score) ranging from 8 to 40. For use in cross tabulation OIDP add score was dichotomized into affected and not affected. Any value within 9 to 40 was considered affected with impacts at one or other point of time in last 3 months and a value of 8 was considered not affected.

Clinical Examination

Caries was assessed using the decayed, missing, and filled tooth index (DMFT) as recommended by the World Health Organization (WHO).[12] The examination was done by single examiner with dental mirrors and CPI probes under natural light and with gauzes to clean the teeth.

Statistical Analysis

The analysis of the study was carried out using the statistical package for social sciences (SPSS version 14.0). The cutoff level for statistical significance was taken at <0.05. Spearman's rank test was used to obtain correlations between the OIDP variables and frequency of brushing, past dental attendance, DT, DMFT. Internal reliability was tested by using the standardized Cronbach's alpha coefficient, as well as item total and interitem correlations. Hierarchical multiple regression analysis was done to assess the effect of sociodemographic factors and caries experience on prevalence of oral impacts.

RESULTS

A total of 359 children completed all stages of the survey. The mean age of the children was 13.96 ± 0.6 years. Their distribution according to the sociodemographic variables is presented in Table 1.

All the subjects completed the Child-OIDP frequency inventory providing support to its face validity. Internal consistency reliability (standardized item alpha) was 0.88. The interitem correlations ranged from 0.32 (eating/social contact with people) to 0.64 (contact with people/emotion). The corrected item total correlation (i.e. the correlation between each item and the total score omitted for that item) ranged from 0.56 (eating) to 0.70 (emotion) being above the minimum level of 0.20 for including an item into a scale. The Cronbach's alpha decreased when any one item was deleted from the scale (Table 2).

Correlational analyses revealed that frequency of brushing had significant positive correlation with only 'eating'. Dental attendance, decayed teeth and DMFT had showed significant positive correlation with all the impacts and the OIDP ADD score (Table 3).

The mean OIDP score for the population was 12.13 ± 5.85. The most prevalent impact was 'difficulty in eating' (37%) of respondents and the least affected daily performance was social contact 17%. The mean score was highest for 'eating' followed by 'cleaning' and 'sleeping (Table 4). The mean DMFT of the cadets was 1.59 ± 1.74 and the mean DT is 1.4 ± 1.63 showing the major component of DMFT constituted decayed teeth. Socioeconomic status showed significant negative correlation with decayed teeth ($p = 0.03$) while significant positive correlation was seen with filled teeth ($p < 0.01$).

Hierarchical multiple regression analysis was done to assess the effect of past dental visit and OIDP. Two models were created for the above purpose. The demographic variables were placed in the first model and past dental visits

Table 1: Sociodemographic characteristics of the sample

Variables	*Category*	*% (N)*
Age in years	13	20.3 (73)
	14	63.2 (227)
	15	16.4 (59)
School	Private	80.5 (289)
	Government	19.5 (70)
Socioeconomic status	Upper class	4.5 (16)
	Middle class	42.1 (151)
	Lower class	53.5 (192)
Oral hygiene aids	Brush	100 (359)
	Finger	0
	Others	0
Dentifrice	Toothpaste	95.0 (341)
	Tooth powder	3.9 (14)
	Others	1.1 (4)
Frequency of brushing	Once daily	53.2 (191)
	Twice daily	44.6 (160)
	More	2.2 (8)
Dental attendance	Yes	55.4 (199)
	No	44.6 (160)

and caries experience were placed in the second model with dependant variable as OIDP. The results showed a statistically significant association of past dental visit and caries experience with OIDP in the second model (Table 5).

DISCUSSION

The importance of OHRQoL is particularly relevant for children as a number of their social and psychological coping skills are still developing. To the best of our knowledge there were no studies on Indian children or among the NCC cadets using QoL measures. The present study used for the first time the Indian version of Child-OIDP questionnaire.

The prevalence of oral impacts experienced during the past 3 months by the study population was high but less than that of the studies done among New Zealand (Chen et al, 1996),[13] Malaysian children (Jaafar et al 1999),[14] South African 8- to 10-year-old school children (Naidoo et al, 2001),[15] Uganda adolescents (Åstrøm et al 2003)[16] and Thai primary school children (Gherunpong et al 2004).[2] On the other hand prevalence was higher than the studies done by de Oliveira et al (2004),[17] Yusuf et al (2006)[4] and Mtaya et al (2007).[18] These differences could be due to cross cultural variation in perceptions of disease and health since different people share different values with respect to health.

This study found that 'difficulty in eating' was the most important impact of OHRQoL of children. Similar results have been reported by Åstrøm et al (2003),[16] Gherunpong

Table 2: Internal consistency reliability (Cronbach's alpha) of the OIDP questionnaire

	Corrected item Total correlation	*Cronbach's alpha if item deleted*
Eating	0.567	0.875
Speaking	0.652	0.865
Cleaning	0.678	0.862
Sleeping	0.666	0.863
Smiling	0.697	0.860
Emotion	0.703	0.859
Studying	0.586	0.871
Social contact	0.640	0.868

Table 3: Correlation of frequency of brushing, dental attendance, DT and DMFT with OIDP responses

Variable		*Eating*	*Speaking*	*Cleaning*	*Sleeping*	*Smiling*	*Emotion*	*Studying contact*	*Social add score*	*OIDP*
Frequency of brushing	Correlation coefficient	0.11*	0.06	0.04	0.03	–0.00	0.02	0.00	0.03	0.05
	Sig. (2-tailed)	0.025	0.24	0.38	0.53	0.88	0.63	0.86	0.49	0.26
Dental attendance	Correlation coefficient	0.23**	0.11*	0.19**	0.12*	0.13*	0.14**	0.20**	0.11*	0.21**
	Sig. (2-tailed)	0.00	0.02	0.00	0.01	0.01	0.00	0.00	0.03	0.00
Decayed teeth	Correlation coefficient	0.27**	0.16**	0.29**	0.32**	0.19**	0.22**	0.26**	0.18**	0.37**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DMFT index	Correlation coefficient	0.27**	0.163**	0.29**	0.33**	0.18**	0.21**	0.26**	0.19**	0.37**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*Denotes level of significance at <0.05; **denotes level of significance at <0.01

Table 4: Frequency of OIDP among the cadets

	Percent affected (n)							
Oral impacts	*1 (never affected)*	*2 (once a month)*	*3 (3-4 times a week)*	*4 (1-2 times a week)*	*5 (everyday)*	*% affected (N)*	*Mean*	*Std. deviation*
Eating	63 (226)	12 (43)	13.4 (35)	9.7 (35)	1.9 (7)	37 (133)	1.75	1.12
Speaking	78.8 (283)	7.5 (27)	5.8 (21)	6.1 (22)	1.7 (6)	21.2 (76)	1.44	0.96
Cleaning	63.8 (229)	13.4 (48)	12.5 (45)	29 (8.1)	2.2 (8)	36.12 (130)	1.71	1.09
Sleeping	74.9 (269)	7.8 (28)	10 (36)	5.3 (19)	1.9 (7)	25.1 (90)	1.51	1.00
Smiling	77.2 (277)	7.8 (28)	6.1 (22)	6.7 (24)	2.2 (8)	22.8 (82)	1.49	1.02
Emotion	75.8 (272)	9.2 (33)	7.5 (27)	5.3 (19)	2.2 (8)	24.2 (87)	1.49	0.99
Studying	78.8 (283)	7.5 (27)	7 (25)	6.1 (22)	0.6 (2)	21.2 (76)	1.42	0.90
Social contact	83 (298)	9.5 (34)	3.3 (12)	3.1 (11)	1.1 (4)	17 (61)	1.29	0.77

Table 5: Multiple hierarchical regression analysis

Model	*Parameters*	*Odds ratio*	*T*	*p-value*
1	Age	0.010	0.182	0.855
	School	0.012	0.220	0.826
	Dentifrice	0.052	0.975	0.330
	Frequency	0.056	1.039	0.300
	SES	0.069	1.268	0.206
2	Age	0.005	0.094	0.925
	School	0.024	0.480	0.632
	Dentifrice	0.058	1.155	0.249
	Frequency	0.050	0.975	0.330
	SES	0.068	1.324	0.186
	Dental visit	0.137	2.642	0.009
	Caries experience	0.298	5.872	0.000

et al (2004),[2] Yusuf et al (2006)[4] and Mtaya et al (2007).[18] Difficulty with 'cleaning' was next most prevalent impact of children which was similar to studies done by Yusuf et al. (2006),[4] Mtaya (2007)[18] and Åstrøm et al (2003),[16] but smiling was reported to be the most common impact after 'difficulty in eating' by Gherunpong et al (2004).[2] Gum problems can cause bleeding and swollen gums which can lead to oral impacts, particularly in relation to 'difficulty in cleaning'. Children with difficulty in 'cleaning their teeth' may not achieve good levels of oral hygiene because brushing may lead to bleeding, and their gum problems would undoubtedly remain or even get worse.

Impacts relating to social dimensions, such as 'study being affected', speaking and 'contact with people' were least prevalent. Similar results were reported by Gherunpong et al (2004),[2] Yusuf et al (2006)[4] and Mtaya (2007).[18] Lesser impacts were found with respect to 'contact with the people' suggesting that cadets were more concerned with function of the teeth. Interestingly, a larger proportion of participants who had never visited a dentist reported fewer impacts than to those who had visited a dentist within the last 1 year. This was consistent with results reported by Masalu (2002),[19] Åstrøm et al (2003),[16] and Mtaya et al (2007).[18] A possible explanation for this paradoxical observation could lie in the oral health care seeking behavior of this population. Cadets generally visit dentist only if there is a severe oral condition requiring immediate attention, which suggests that those visiting a dentist would be an orally less healthy group compared to those who never visited a dentist. This phenomenon is termed as 'healthy person nonvisitor effect' (Okunseri et al 2005),[20] and perhaps similar to the well-known 'healthy volunteer effect'.

Socioeconomic status showed significant negative correlation with number of decayed teeth and significant positive correlation with filled teeth. The reason may be due to increased awareness and frequent dental visits of the higher socioeconomic class than the lower socioeconomic class cadets. The lack of significant association between socioeconomic status and prevalence of oral impacts suggests that the impacts were affecting all the social classes and there was no gradient.

Cadets with caries experience (DMFT > 1) had reported significantly higher impacts than those without the caries experience (DMFT = 0). The reason may be due to caries which can cause difficulty in performing the routine daily activities when it approaches the pulpal tissues.

Despite the low caries prevalence higher impacts were reported which might be due to other conditions like sensitive tooth, oral ulcers, tooth ache, exfoliating primary tooth, etc. as reported by Gherunpong et al (2004).[2]

Although children can not specify precisely which impairments leads to impacts, the clinician should exclude impacts from some conditions which are not definitely related to actual impairments as well as to treatment needs and plan accordingly. However, the accuracy of detecting perceived impairment is limited in a population based study; it can be improved at the individual level of investigation. The compartmentalization involved in viewing the oral cavity distinct from the rest of the body must abate because oral health affects general health by causing considerable pain and suffering and by changing what people eat, their speech and their QoL and well-being. Oral and other chronic diseases have determinants in common, so more emphasis should be on the common risk factor approach. The key concept underlying future oral health strategies is integration with this approach, a major benefit being the focus on improving health conditions in general for the whole population and for groups at high risk, thereby reducing social inequities. By integrating oral health into strategies for promoting general health and by assessing oral needs in sociodental ways, health planners can greatly enhance both general and oral health.

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