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Oral health related quality of life among children with parents and those with no parents

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Objectives: To compare the oral health related quality of life (OHRQoL) and caries status between school children living with their parents and orphan children, and to assess the factors that influence the oral health related quality of life. ***Methods:*** Study sample consisted of 279 school children living with their parents and 257 orphan children thus making a total sample of 536 school children. Sampling frame comprised of 12-15 year old children attending two upper primary public schools and two special schools for orphan children at Udaipur city, India. Clinical examination for caries status and personal interviews for oral health related quality of life were conducted by a single investigator. ***Results:*** Children without parents presented poor scores for OHRQoL compared to those having parents. Caries status was significantly related to OHRQoL and its domains. Subjects with no caries reported good OHRQoL which deteriorated as the caries score increased. Children who never visited dentist reported poorer OHRQoL than regular visitors and males experienced better oral health quality of life than females. All the four variables (gender, group, dental visits and DMFT) entered the step wise linear regression analysis when the effect of each independent variable was adjusted for all others and were responsible for a variance of 21.6% for OHRQoL; however DMFT constituted the first best predictor which solely explained a variance 15.8%. ***Conclusions:*** Oral health related quality of life along with its domains differed significantly between children with and without parents. Furthermore, gender, dental visiting habits and caries status significantly influenced the OHRQoL.

Key words: *School children; OHRQoL; Dental caries*

Introduction

Oral health related quality of life (OHRQoL) has been studied over the past 15 years, with the development and testing of measures designed to assess the functional, social, and psychosocial outcomes of oral disorders using self-reported questionnaires (Slade, 1997). OHRQoL is a rapidly growing notion. The concept of OHRQoL is particularly significant to 3 areas - clinical practice of dentistry, dental research and dental education. There are different approaches to measure OHRQoL; the most popular ones use multiple item questionnaires. (Al Shamrany, 2006)

The World Health Organization (WHO, 1993) defines quality of life as ‘‘an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad-ranging concept affected in a complex way by the person’s physical health, psychological state, level of independence, social relationships, and their relationships to salient features of their environment. According to child developmental psychology, children have the ability to make evaluative judgments of their appearance; the quality of friendships and other people’s thoughts, emotions and behaviors gradually develops through middle childhood (6–10 years) and by the age of 11 or 12 they view health as a multidimensional concept organized around the following constructs: being functional, adhering to good lifestyle behaviors, a general sense of well-being and relationships with others (Barbosa and Gaviao, 2008). Though many measures of OHRQol are existent in adults, there is a lack of constructs that assess the impact of oral health on the quality of life in children and adolescents with very few of them being valid and reliable. Much of the literature on children’s OHRQoL has been laid down by Jokovic *et al*., (2003) with the Child Perceptions Questionnaire (CPQ).

Oral diseases seriously impair quality of life in a large number of individuals and they may affect various aspects of life, including function, appearance, interpersonal relationships and even career opportunities (Gift and Redford, 1992). In turn, oral disease pattern is dependent on various socioeconomic characteristics of the children and parents. Thus, it can be hypothesized that the pattern of oral disease and quality of life would be different among children living with their parents and orphan children who do not have parents. Furthermore, the children residing in orphanages differ from other children as they are under privileged and do not receive as much care as other children receive from their parents. Hence the present study was directed towards comparing the oral health related quality of life and caries between school children living with their parents and orphan children, and to assess the factors that influence the oral health related quality of life.

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Material and Methods

Study sample consisted of 279 school children living with their parents and 257 orphan children thus making a total sample of 536 school children. Sampling frame comprised of 12-15 year old children attending two upper primary public schools and two special schools for orphan children at Udaipur, India. All the children present on the days of the survey were included and those unwilling (4 orphan children and 5 children with parents) to participate were excluded. Data on oral health related quality of life was collected by personal interviews which were conducted by a single investigator and the same investigator performed the clinical examination of each subject for caries status. Additionally, age, gender and dental visiting habits of each subject were recorded. DMFT index was used for caries assessment in accordance with WHO guidelines. A tooth was classified as carious when there was either a cavity, undermined enamel or a softened floor or wall or pit or fissure on one of the smooth surfaces. A plane mouth mirror and CPI probe was used for caries examination under adequate illumination. Intraexaminer reliability was measured by kappa statistic and accounted to 89%.

Written informed consent was obtained from all the participating children and permission for conducting the study was availed from principals of concerned schools. Members of research team made preliminary contact with the targeted school and orphanages and asked for the permission. Ethical clearance for conducting the study was procured from ethical committee of Darshan Dental College and Hospital, Udaipur. The OHRQOL instrument proposed by Jokovic *et al*., (2003) is a questionnaire of 31 items, describing problems that occur most frequently and cause the most bother to patients. It consists of four domains: oral symptoms, functional limitations, emotional well-being and social well-being, and, as with other quality of life measures, it assesses the frequency and impact of oral health problems in these domains. Oral symptoms was the first domain consisting of 6 questions such as whether in the last 3 months, the children had pain in the mouth or bad breath, bleeding gums, mouth sores, etc. The second domain's 8 items about functional limitations included questions about difficulty in chewing firm foods, in taking hot/cold food and restrictions to diet. The third domain, emotional well-being, had 7 questions about feeling shy/embarrassed, anxious/fearful, and irritated/frustrated. The fourth domain's 10 questions were about social well-being. The responses were scored as: 5 never; 4 once or twice; 3 sometimes; 2 often, 1 everyday or almost everyday. Thus the scale ranges from 31 to 155. The greater the OHRQoL score the better the oral health related quality of life.

Statistical Package for Social Sciences, Version 15.0 (Chicago, IL) was used for data analysis. Descriptive statistics are presented as means and standard deviation. Mann Whitney test was used to assess the statistical differences between the children living with parents and orphan children for each OHRQoL item, its domains and caries status while Kruskal Wallis was executed to compare between more than two groups. Step wise linear regression analysis was executed to assess the influence of various independent variables (gender, group, dental visits and DMFT) on oral health related quality of life.

Results

Out of the total sample of 536 children 279 had parents and 257 were without. It was noted that the children without parents had poor scores for oral health related quality of life items (Table 1). The mean decayed component was found to be 1.33 in children with parents compared to 1.44 among those without parents; however this difference was insignificant.

In relation to oral symptoms, school children with parents recorded significantly higher mean scores for all the items however no difference was observed for food stuck to the roof of mouth.

Children without parents reported significantly poorer functional status and social well-being than the comparison group. For questions about emotional well-being, significant differences in the mean scores were observed for items like "felt irritated", "worried about being different from other people", "having fewer friends", which were 4.20, 4.40 and 4.45 for children with parents and 3.72, 4.15, 4.14 for the other group respectively.

Caries status was significantly related to OHRQoL and its domains (Table 2). Subjects with no caries reported better OHRQoL which deteriorated as the caries experience increased. Similarly, overall OHRQoL score and domain scores were significantly higher in children living with parents than orphan children. Children who never visited dentist reported poorer OHRQoL and lower domain scores than regular visitors.

Males experienced better oral health quality of life than females. Nevertheless, there was no significant difference between the genders for functional limitation and emotional well-being.

All the four variables entered the step wise linear regression analysis when the effect of each independent variable was adjusted for all other variables and were responsible for a variance of 21.6% for OHRQoL (Table 3), however DMFT constituted the best predictor which solely explained a variance of 15.8%.

Discussion

Sheiham (2005) noted that oral health affects people physically and psychologically and influences how they grow, enjoy life, look, speak, chew, taste food and socialize, as well as their feelings of social well-being. This led to the development of many instruments to measure the effect oral health exerts on quality of life.

Until recently, clinicians have relied on a variety of clinical indices, such as the DMFT index and the Community Index of Periodontal Treatment Needs (CPITN), to assess the outcomes of oral disease. Whilst the information yielded by these measures is clinically relevant, they primarily measure the end-point of the disease process. A number of authors like Locker (1988) and Guyatt *et al.,* (1993) have advocated the use of patient-based assessments of outcomes to gain more substantive information on the impact of oral disorders on health-related quality of life.

This led many researchers to formulate OHRQoL instruments (and more recently, interest in children's quality of life arose, Meuleners et al., 2003) which include social, psychological, functional aspects, as well

Table 1. Mean scores for DMFT and OHQOL items among school children living with parents and orphan children

	With parents		*Without parents*		
	Mean (SD)	*95% CI*	*Mean (SD)*	*95% CI*	*Significance*
Decayed	1.33 (1.28)	1.18 – 1.48	1.44 (1.45)	1.26 – 1.62	0.622, NS
Missing	0.15 (0.48)	0.10 – 0.21	0.00 (0.00)	0.00 – 0.00	<0.001
DMFT	1.49 (1.40)	1.32 – 1.65	1.44 (1.45)	1.26 – 1.62	0.535, NS
Oral symptoms					
Food caught between teeth	3.73 (0.87)	3.63 – 3.83	3.44 (1.23)	3.29 – 3.59	0.038
Pain in teeth/mouth	4.27 (0.83)	4.17 – 4.37	3.49 (1.09)	3.36 – 3.62	<0.001
Bad breath	4.35 (0.80)	4.25 – 4.44	4.08 (0.90)	3.97 – 4.19	<0.001
Bleeding gums	4.30 (0.89)	4.19 – 4.40	3.47 (1.09)	3.34 – 3.60	<0.001
Mouth sores	3.97 (0.97)	3.86 – 4.09	3.83 (0.77)	3.74 – 3.93	0.010
Food stuck to roof of the mouth	4.19 (0.98)	4.07 – 4.31	4.32 (0.70)	4.23 – 4.40	0.670, NS
Functional limitations					
Difficulty in chewing firm food	4.24 (0.92)	4.13 - 4.35	3.70 (1.10)	3.56 - 3.84	<0.001
Unclear speech	4.43 (0.80)	4.07 - 4.31	4.19 (1.02)	4.33 - 4.53	0.019
Difficulty in drinking/eating hot/cold food	4.27 (0.94)	4.16 - 4.38	3.58 (1.23)	3.43 - 3.73	<0.001
Slow eating	4.53 (0.84)	4.22 - 4.43	4.33 (0.91)	4.42 - 4.63	0.004
Breathing through mouth	4.76 (0.55)	3.84 - 4.08	3.96 (1.04)	4.69 - 4.83	<0.001
Restricted diet	4.27 (0.91)	4.16 – 4.38	4.29 (1.07)	4.16 – 4.42	0.220, NS
Trouble sleeping	4.39 (0.95)	4.28 – 4.50	3.57 (1.10)	3.44 – 3.71	<0.001
Difficulty in eating foods you would like to eat	4.36 (0.99)	4.24 – 4.48	3.44 (1.12)	3.30 – 3.58	<0.001
Emotional wellbeing					
Felt irritated/frustrated	4.24 (1.00)	4.12 – 4.36	3.72 (1.12)	3.59 – 3.86	<0.001
Felt worried about being less attractive than others	4.21 (0.96)	4.10 – 4.33	4.33 (0.87)	4.23 – 4.44	0.187, NS
Felt shy/embarrassed	4.34 (0.98)	4.22 – 4.45	4.26 (0.54)	4.58 – 5.95	0.042
Felt anxious/fearful	4.19 (0.96)	4.07 – 4.30	4.13 (1.10)	3.99 – 4.26	0.919, NS
Worried about being different from other people	4.40 (0.85)	4.30 – 4.50	4.15 (0.71)	4.06 – 4.24	<0.001
Worried about having fewer friends	4.45 (0.95)	4.34 – 4.56	4.14 (0.83)	4.03 – 4.24	<0.001
Was upset	4.40 (0.97)	4.29 – 4.52	3.14 (1.32)	2.98 – 3.30	<0.001
Social wellbeing					
Teased/called names by other children	3.89 (1.18)	3.75 – 4.03	3.96 (0.64)	3.88 – 4.04	0.174, NS
Avoided smiling around other children	4.51 (0.80)	4.42 – 4.61	4.22 (0.80)	4.12 – 4.32	<0.001
Have been asked by other children about the condition	4.52 (0.87)	4.42 – 4.62	4.45 (0.56)	4.38 – 4.52	<0.001
Not wanted to read/speak aloud in the class	4.48 (0.94)	4.37 – 4.59	4.19 (0.65)	4.11 – 4.27	<0.001
Not wanted to talk to other children	4.43 (0.99)	4.31 – 4.54	4.32 (0.93)	4.20 – 4.43	0.014
Left out by other children	4.39 (0.93)	4.28 – 4.50	4.60 (0.61)	4.53 – 4.68	0.044
Difficulty in paying attention in the school	4.34 (0.98)	4.22 – 4.45	3.92 (0.99)	3.80 – 4.04	<0.001
Not wanted/unable to be with other children	4.27 (1.07)	4.15 – 4.40	4.22 (0.97)	4.10 – 4.34	0.196, NS
Missed school	4.49 (0.92)	4.39 – 4.60	3.87 (0.83)	3.76 – 3.98	<0.001
Not wanted/unable to take part in activities	4.57 (0.91)	4.46 – 4.67	3.79 (0.82)	3.69 – 3.89	<0.001

as oral health (Tapsoba *et al*., 2000). However, Tsakos *et al.,* (2006) advocated that OHRQoL measures cannot replace normative needs and hence both should be used in combination in order to cover different dimensions of oral health. Consequently, we assessed the oral health related to quality of life in addition to dental caries experience in the present study. However, it is evident from past literature that a gradient in general and oral health occurs between the populations based on the socioeconomic status, income and family characteristics.

On the other hand, children residing in orphanages pose a special problem as many of the children in the orphanages are previously street children. Kahabuka and Mbawalla (2006) observed that the environment in which they live and the associated lifestyles makes street children vulnerable to a wide range of health related and other problems including malnutrition, communicable and infectious disease and poor oral health.

Thus, the present study was directed towards the comparative evaluation of caries status and OHRQoL among children living with parents and children with no parents. The mean number of decayed teeth was found to be greater in children without parents than children with parents, though the difference was insignificant. Locker *et al*., (2004) observed that low parental socioeconomic position was significantly associated with greater dental caries and periodontal disease experience. This insignificant difference for mean number of decayed teeth and dental caries experience may be due to non-availability of cariogenic diet and stricter dietary control among institutionalized orphan children.

Table 2. Cumulative scores and their standard deviations for OHRQoL and its domains in relation to caries levels, dental visit, and gender and comparison groups

	Oral symptoms	*Functional limitation*	*Emotional well-being*	*Social well-being*	*OHRQoL score*
Group					
With parents	24.81 (3.24)	34.01 (5.02)	30.22 (4.58)	43.88 (6.16)	132.92 (16.45)
Without parents	22.63 (4.64)	32.30 (5.06)	28.88 (7.08)	41.54 (4.85)	125.35 (16.01)
Significance	0.0001	0.0001	0.0001	0.0001	0.0001
Gender					
Male	24.41 (3.77)	33.33 (5.03)	29.89 (4.53)	43.16 (5.96)	130.78 (16.74)
Female	22.79 (4.43)	32.99 (5.24)	29.11 (7.58)	42.15 (5.21)	127.03 (16.32)
Significance	0.003	0.459, NS	0.137, NS	0.043	0.011
Dental visit					
Within 2-3yrs	25.31 (2.94)	35.21 (4.01)	30.76 (3.17)	45.16 (4.110	136.44 (12.09)
Within 12 months	23.55 (4.21)	33.03 (5.06)	29.52 (6.19)	42.45 (5.50)	128.55 (16.15)
Never	23.29 (4.33)	31.50 (6.24)	28.19 (6.630	41.93 (8.42)	124.90 (23.93)
Significance	0.003	0.0001	0.079, NS	0.001	0.0001
Caries (DMFT)					
0	26.06 (2.64)	34.98 (3.77)	29.92 (4.18)	44.76 (3.99)	135.71 (11.04)
1-2	23.36(3.51)	32.80 (5.36)	30.88 (6.28)	42.35 (5.76)	129.39 (15.71)
3-4	22.45 (4.37)	32.40 (4.84)	27.01 (6.41)	41.49 (7.02)	123.35 (19.59)
5 or more	15.13 (3.73)	26.39 (5.47)	22.87 (4.89)	36.35 (3.15)	100.74 (13.13)
Significance	0.0001	0.0001	0.0001	0.0001	0.0001

Table 3. Step wise regression analysis with OHRQoL score as the dependent variable

Model	*Predictor*	R^2	*df*	*Beta*	*F*	*Significance*
1	DMFT	0.158	534	-0.396	100.453	<0.001
2	Group	0.213	533	-0.265	72.117	<0.001
3	Gender	0.213	532	-0.016	48.005	<0.001
4	Dental visit	0.216	531	-0.077	36.942	<0.001

Furthermore, previous data report that individuals from low income households have poorer general and oral health than those from high income households (Gilbert *et al*., 2003). Repetti *et al.* (2002) found that families characterized by conflict, hostility, aggression, cold parent–child relationship and neglect placed the individual at risk of mental and physical disorders in adolescence and chronic health conditions in adulthood. Many of the children at orphanages are previously street children or from broken families and therefore frequently complained of oral symptoms and had poor OHRQoL. When emotional well-being was considered in the present study, children without parents were more shy, anxious, fearful, frustrated and irritated than those children having parents.

In the present study, children at orphanages reported greater functional limitations and poor social well-being. They frequently avoided smiling, did not want to read aloud and talk to other children, were left out by other children, had difficulty in paying attention at school, were unable to take part in activities and missed school.

Sanders and Spencer (2005) found that childhood circumstances as indicated by socioeconomic position, family structure and parenting quality influenced psychological and psychosocial attributes, and these in turn influenced oral health outcomes in terms of the social impact of dental disease.

It was observed from the results that males had better OHRQoL than females. Similar gender predilection for OHRQOL was observed among Canadian children by Locker (2007). Nevertheless, no significant differences were noticed between the genders for the domains functional limitation and emotional well-being. The reason for this finding could not be established and we were not able to trace any studies in the literature that evaluated differences between genders for OHRQoL domains in this age group.

In the present study, it was observed that those who never visited a dentist had worse OHRQoL. It could be speculated that those who never visited a dentist would have accumulated untreated dental disease which detracts from their day to day living and life quality. It was observed among children and adults that dental visiting habits influence OHRQoL (Locker, 2007).

Regression analysis showed that all the independent variables (DMFT, group, gender and dental visit) significantly influenced OHRQoL. Individuals with greater caries experience exhibited poorer OHRQoL and recorded the poorest domain scores; this is in agreement with a previous report by Do and Spencer (2007) which

observed greater caries experience to be associated with lower OHRQoL.

In conclusion, oral health quality of life along with its domains differed significantly between the study groups. Furthermore, gender, dental visiting habits and caries status significantly influenced the oral health quality of life. Further studies on a larger representative sample could provide a clearer picture on the influence of various factors on oral health related quality of life.

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