Mothers' sense of coherence and oral health related quality of life of preschool children in Udupi Taluk

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Objective: To assess the relationship between mothers' Sense of Coherence (SOC) and oral health related quality of life (OHRQoL) of 3-5 year old preschool children in Udupi Taluk. *Participants:* 388 mothers aged 24-48 years old and their preschool children. *Basic research design:* A cross sectional study of mother-child pairs, randomly selected from 8 preschools. *Method:* Information was obtained about mothers' sociodemographic factors along with the short version (SOC 13) of Antonovsky's sense of coherence scale and children's OHRQoL using the early childhood oral health impact scale (ECOHIS). Chi-square tests and multivariate logistic regression were used for analysis. *Main outcome measures:* Mothers' SOC and children's OHRQoL. *Results:* Mothers' SOC and fathers' education were significantly associated with children's OHRQoL in multivariate analysis. Children of mothers with high SOC were 12.9 times as likely to have high OHRQoL as mothers with low SOC (p<0.01). Children of fathers with college/university education were twice as likely to have high OHRQoL as those with primary education (p<0.05). *Conclusion:* Our results suggest that mother's SOC could be a psychosocial determinant of the OHRQoL of their preschool children. Family environment should be considered when designing interventions to promote or improve the oral health as well as OHRQoL of preschool children.

Key words: *sense of coherence, children, oral health, quality of life, socioeconomic factors*

Introduction

Various models based on biomedical or psychosocial factors have been proposed to explain oral diseases, mainly dental caries and periodontal diseases. The psychosocial models used are derived from the theoretical models of general diseases. Salutogenic theory, one of the psychosocial approaches, has gained importance in the last two decades (Freire *et al*., 2001) and its name is derived from saluto (health) and genesis (origins) reflecting that rather than identifying causes of disease, it focuses on factors that support human health and well-being (Antonovsky, 1993). The salutogenic theory comprises two concepts: general resistance resources and sense of coherence (SOC). Social support, material resources, coping strategies, family socialisation and physical characteristics are the general resistance resources that neutralise the effects of stressful life events and promote successful management of tension (Bonanato *et al*., 2009). SOC is the central construct of the salutogenic model. It seeks to explain the relationship between stressors and both subjective and objective evaluations of health (Savolainen *et al*., 2005a). SOC is based on three core components: comprehensibility, the ability of people to understand what is happening around them; manageability, the extent to which they feel capable of managing the situation; and, meaningfulness, the ability to find meaning in the situation (Lindström and Eriksson, 2005). Various studies have found association between frequency of toothbrushing (Savolainen *et al*., 2005b), dental attendance pattern (Freire *et al*., 2002) and oral health related knowledge,

attitude and behaviour (Lindmark *et al*., 2011) with SOC. Normative needs are the professionally based measures used to assess individual or population needs. Normative needs are important as they provide insight into clinical aspects of illness. Subjective measures of health are also important, as they provide information about peoples' feeling and satisfaction with their quality of life. Dental caries, if progressed can lead to pain, which can affect the child's daily life such as difficulty when eating, smiling, speaking and managing to attend school. Children's siblings and parents may also be affected by oral conditions of the children, as parents spent most of their time with their children (Yusuf *et al*., 2006). Thus, one such subjective measure of oral health, Early Childhood Oral Health Impact Scale (ECOHIS) was used in the present study to assess the impact of oral health problems on the quality of life of 3 to 5 year old children and their families (Pahel *et al*., 2007).

Children's oral health behaviour is influenced by mothers' behaviour and oral healt. Mohebbi *et al*. (2008) found that children's dental caries experience have been associated with mothers' tooth brushing habits. Also, mothers' social and psychological factors have been found to be associated with children's dental caries experience (Finlayson *et al*., 2007). Mothers' SOC is a new psychosocial approach to understanding children's oral health and behaviour. Higher SOC of mothers of preschool children was associated with fewer decayed and filled teeth (Bonanato *et al*., 2009). Although adolescents' dental caries experience and dental attendance has been associated with mothers' SOC (Freire *et al*., 2002), little is known

about the relationship between mothers' SOC and their child's oral health related quality of life, particularly of 3-5 year-olds. Thus, the present study was conducted to assess the relationship between mothers' SOC and oral health related quality of life (OHRQoL) of 3-5 year old school children in Udupi Taluk. We examined the hypothesis as to whether mothers' SOC influences the OHRQoL of their 3-5 year old preschool children.

Methods

A cross sectional study was carried out among 388 mother-child pairs selected from Anganwadis and day-care centres in Udupi Taluk, located in southwestern part of Udupi District, Karnataka, India in the month of May 2013. Anganwadis are courtyard shelters providing basic nutrition, informal pre-school education and healthcare services to the preschool children. The Anganwadis function under the Department of Women and Child Development and a Child Development Project Officer (CDPO) is in charge of them, in each Taluk. Children from low-income families usually attend Anganwadis as the services are provided by the government free of cost. While, most children of the high-income families pursue their preschool education in private day-care centres which charge for their services. Both Anganwadis and day-care centres were selected to represent the children from different social strata. The list of the 510 Anganwadis and day-care centres in Udupi Taluk was obtained from the CDPO. Each preschool location would have approximately 50 children. Four Anganwadis (215 children) and four day-care centres (210 children) were selected by simple random sampling to attain the calculated sample size for the study.

Inclusion criteria were having children of aged 3-5 years, with no underlying serious medical conditions, not taking long-term medications and whose mothers consented to participate in the study. Ethical clearance was obtained from the Kasturba Hospital Ethics Committee, Manipal before commencement of the study (IEC157/2013). Informed consent was obtained from all the mothers' prior to the start of the study.

The intended sample size was calculated to be 374 using 80% power and alpha error at 5%, with anticipated 55% prevalence of at least one impact on children's' OHRQoL (Pentapati *et al*., 2013) and a minimum difference to be detected between the groups was kept at 10%. Thus, questionnaires were to be distributed to around 400 mothers to account for non-response.

Data were collected through a self-administered questionnaire which was distributed to the mothers when they came to pick-up or drop their children. The filled proformas were collected in after 15-20 minutes and checked for completeness and mothers with incomplete forms were asked to complete them. The questionnaire was filled out by mothers and consisted of three parts. The first part gathered information regarding socio-demographic characteristics of parents including age, education and occupation plus the age and gender of the child. Occupation was categorised according to British Registrar General's Classification of Occupation (BRGCO, Galobardes *et al*., 2006). Parental education was categorised into: primary school level or no educa-

tion, secondary school level and college/university level of education (Bernabe *et al*., 2011).

The second part of the questionnaire was an early childhood oral health impact scale (ECOHIS) which assesses oral health related quality of life and has demonstrated good reliability with Chinese preschool children (Lee *et al*., 2010). ECOHIS consists of 13 questions and has two main parts: a child impact section (nine questions) and a family impact section (four questions). Each question asks about the frequency of an oral health-related problem. Response categories of ECOHIS were coded using a four-point Likert scale: 0, never; 1, hardly ever; 2, occasionally; 3, often/very often; 4, don't know. The original five-point distinguished between the responses "very often" and "often" but to avoid difficulties distinguishing between these categories they were collapsed into one for this study (Wong *et al*., 2011). Subjects with any missing or 'don't know' responses to one or more items were excluded from the analysis. Item scores were simply added to create a total scale score ranging of 0–39, with higher scores indicating greater impacts and⁄or more problems and low OHRQoL (Wong *et al*., 2011).

The third part of the questionnaire assessed mothers' sense of coherence using the short version of the sense of coherence scale or SOC-13 (Antonovsky, 1993). It consists of 13 items on a 7-point Likert scale with wording provided only for the extreme scores (1 and 7). SOC consist of 3 measures: comprehensibility (5 items), manageability (4 items), and meaningfulness (4 items). The SOC total score ranges from 13-91. Negatively worded items were reverse-scored, so a high score indicated a strong SOC.

Kannada is the regional language of Karnataka; hence, the questionnaire was translated into Kannada language. The validity was checked by a back translation method, involving blind retranslation into English. The validity of translation was verified by experts in both languages. Internal consistency reliability of ECOHIS and SOC was checked using Cronbach's alpha which was found to be 0.78 and 0.75 for ECOHIS and SOC scale respectively. Cronbach's alpha values over 0.7 are regarded as satisfactory (Bland and Altman, 1997). Assessment of test-retest reliability of SOC and ECOHIS scales was carried out among 45 mothers selected from one Anganwadi (n=20) and one day-care centre (n=25). SOC and ECOHIS questionnaire were administered on two occasions separated by interval of two weeks. Intraclass correlation coefficient of SOC and ECOHIS was 0.65 and 0.61 respectively. Statistical analysis was performed using SPSS v16. Association between mothers' SOC, sociodemographic characteristics and children's OHRQoL were investigated using chi-square test. Variables which showed significant association with children's OHRQoL in bivariate analysis, were included in multivariate analysis. Multivariate analysis was applied using multiple logistic regression (enter method) with high OHRQoL as outcome measure. Based on median score of 41, SOC scores were dichotomised into high (>41) and low (≤41) SOC (Bonanato *et al*., 2009). Similarly ECOHIS scores were dichotomised into high and low OHRQoL based on median score of 11. In analyses, $p<0.05$ was considered significant.

Results

Of the 425 mother-child pairs across the 4 Anganwadis and 4 day-care centres, 25 children did not meet the inclusion criteria, mostly because their age was not in the range of 3-5 years. From the 400 questionnaires issued, 388 were returned completed, a response rate of 94%. The mean age of the mothers was 32.7 (sd 4.7) years and that of children was 4.2 (sd 0.7) years. Boys (50.8%) and girls were almost equally distributed in the sample. Almost half of the mothers and almost 60% of fathers had completed their education to secondary level. BRGCO occupations were collapsed into two categories for the purpose of analysis: *high occupations,* categories I-IIIN i.e. professional, managerial and lower professional and non-manual skilled occupations; and, *low occupations*, IIIM-V i.e. manual skilled, semi-skilled and unskilled occupations. Of mothers, 38.7% had high occupations, while for fathers this value was 48.5% (Table 1).

Both mothers' and fathers' education (each p<0.05) and mothers' SOC (p<0.01) were all associated with OHRQoL of their children. High OHRQoL of preschool children was found among more mothers' with secondary school (54.6%) and college or university level of education (35.7%) than mothers with less education (9.7%, Table 2). Mothers' with college level of education had protective effect on children's OHRQoL (OR=0.49, p<0.05, Table 3). Children of fathers' with college/university education were twice as likely to have high OHRQoL as those with primary education (p<0.05). Three-quarters of mothers of children with high OHRQoL had high SOC. OHRQoL was considerably higher among children of mothers with high SOC compared to children of mothers with low SOC (OR=12.9, p<0.01).

Table 1. Baseline characteristics of the participants

Characteristics	n	(%)	Mean	(sd)
Mother's age in years			32.7	(4.7)
Age of child in years			4.2	(0.7)
Gender of child				
Male	197	(50.8)		
Female	191	(49.2)		
Mother's education				
Primary or none	56	(14.4)		
Secondary school	204	(52.6)		
College or university	128	(33.0)		
Mother's occupation				
High occupation	150	(38.7)		
Low occupation	238	(61.3)		
Father's education				
Primary or none	47	(12.1)		
Secondary school	231	(59.5)		
College or university	110	(28.4)		
Father's occupation				
High occupation	188	(48.5)		
Low occupation	199	(51.3)		

Table 2. Association between mothers' sense of coherence, socio-demographic characteristics and children's OHRQoL

Characteristic	High OHRQoL		Low OHRQoL		χ^2
	n	(%)	n	(%)	p value
Mother's education					
Primary or none	18	(9.7%)	38	(18.7%)	**0.03**
Secondary school	101	(54.6%)	103	(50.7%)	
College or university	66	(35.7%)	62	(30.5%)	
Mother's occupation					
High occupation	73	(39.5%)	77	(37.9%)	NS
Low occupation	112	(60.5%)	126	(62.1%)	
Father's education					
Primary or none	17	(9.2%)	30	(14.8%)	**0.03**
Secondary school	105	(56.8%)	126	(62.1%)	
College or university	63	(34.1%)	47	(23.2%)	
Father's occupation					
High occupation	98	(53.3%)	90	(44.3%)	NS
Low occupation	86	(46.7%)	113	(55.7%)	
Gender of child					
Male	96	(51.9%)	101	(49.8%)	NS
Female	89	(48.1%)	102	(50.2%)	
Sense of coherence					
Low	46	(24.9%)	162	(79.8%)	**<0.01**
High	139	(75.1%)	41	(20.2%)	
All	185		203		

Note: NS   Not significant

Table 3. Multivariate logistic regression analysis showing adjusted odds ratios with 95% confidence intervals for high OHRQoL

	OR (95%CI)	p value
Mother's education		
Primary [Ref]		
Secondary	1.26 (0.41-3.70)	NS
College	0.49 (0.25-0.96)	**0.03**
Father's education		
Primary [Ref]		
Secondary	0.82 (0.24-2.70)	NS
College	2.06 (1.05-4.00)	**0.03**
Mother's SOC		
Low [Ref]		
High	12.9 (7.7-21.00)	**<0.01**

NS Not significant
Outcome variable: High OHRQoL
Notes: [Ref] Reference category

Discussion

This cross-sectional study found that mothers having a stronger SOC (ability to cope up with stressors) was associated with high OHRQoL among their children. Various studies have shown that SOC is a psycho-social determinant of health behaviour such as healthier lifestyles, physical activity (Wainwright *et al*., 2007), healthy food choices (Lindmark *et al*., 2005), lower alcohol consumption and less smoking (Ristkari *et al*., 2005). The few studies investigations association between SOC and oral health have found stronger SOC to be linked with self-reported gingivitis, caries incidence, dental attendance pattern, oral health related knowledge, attitude and behaviour and frequency of toothbrushing (Ayo-Yusuf *et al*., 2008; Bernabe *et al*., 2011; Freire *et al*., 2002; Lindmark *et al*., 2011; Savolainen *et al*., 2005b). Fewer studies have been conducted regarding association between mothers' SOC and oral health related behaviour of children. While mothers' SOC has been found to be associated with their children's utilisation of dental care (Da Silva *et al*., 2011; Freire *et al*., 2002), sugary snack intake among the 5-year-old children was not associated with the parents' SOC (Qiu *et al*., 2013). Our study was the first of its kind to demonstrate the relationship between mothers' SOC and their children's OHRQoL.

The bivariate analysis finding of the present study that parental education was significantly associated with children's OHRQoL was only supported in the case of fathers on multivariate analysis. Conversely, De Paula *et al*. (2012) found that mothers' education was significantly associated with OHRQoL of their children. Likewise in our study, mothers having college education was found to have a protective effect on their children. Most of these mothers would be away from the home at work throughout the day. So perhaps it is not their physical presence but the influence of their education or an associated common factor which explains the effect on their children.

Mothers' SOC has been found to be associated with child SOC, for both boys and girls, which supports Antonovsky's hypothesis (Togari *et al*., 2012). Also, child SOC was the most important predictor of OHRQoL (Baker *et al*, 2010). Bonanato *et al* (2009) demonstrated that higher SOC of mothers' of preschool children was associated with fewer decayed and filled teeth. Also, OHRQoL of children is influenced by their clinical oral health status (Barbosa and Gavião, 2008). Thus, mothers' SOC seems to be a resource that enhances the OHRQoL of children directly, or mediated by a good perceived health. This could be the logical conclusion of the relationship between SOC and OHRQoL.

One of the limitations of the study may be the self-reporting method employed to collect data that could have biased our results. Secondly, a large proportion of mothers scored 0 or 1, both near the bottom or floor of the ECOHIS with little variance in the scores. Such floor effects obscure any real differences between individuals scoring at the lowest possible value. Studies have shown that mothers' SOC has been associated with caries experience of preschool children and adolescents and the latters' dental attendance (Bonanato *et al*., 2009; Freire *et al*., 2002). However, data regarding dental attendance and oral health status of children, besides parents' ages, number of siblings, family income, sanitation, child's gender, etc., were not collected in our study so analyses could not be tested for being potential mediators or counfounders during multivariate analyses. This could have confounded the association between mothers' SOC and OHRQoL of their preschool children. Finally, measures of OHRQoL are subjective and can vary between individuals with similar objective conditions.

As our results suggest that the mother's SOC could be a psychosocial determinant of their children's OHRQoL, there may be advantages in taking into consideration family environment when designing interventions to promote child oral health. Indeed, a cluster-randomised trial among 10-12-year-olds indicated that an intervention aimed at improving SOC, also improved OHRQoL, together with oral health beliefs and gingival health (Nammontri *et al*., 2013).

SOC can be used as a construct to form the coherence needed to create a health-promoting society. Nilsson and Lindström, (1998) proposed some similarities between the learning process and the salutogenic model in that learning is facilitated when the information is structured, comprehensible and meaningful. The salutogenic framework facilitates the learning process and simultaneously promotes health. Thus, action to enhance mothers' SOC might form part of oral health promotion and help to improve the oral health and quality of life of preschool children.

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