

Impact of sense of coherence on oral hygiene, dental caries and periodontal status of young adults in Chennai, Tamil Nadu

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Abstract

Background: Sense of Coherence (SOC) is a logical factor that enables people to cope with stressors and successfully improve health. Oral health has an impact on general health and Quality of Life. This study was undertaken with the aim to assess the impact of SOC with Oral Hygiene, dental caries and periodontal status among young adults in Chennai, Tamil Nadu.

Materials and methods: The study was conducted among 500 young adults of age group 19 to 23 years selected using cluster random sampling. SOC data were collected using 13 item standardized versions of SOC scale proposed by Antonovsky. Oral hygiene status was assessed using Oral Hygiene Index- Simplified (OHI-S) by John C Greene and Jack R Vermillion, Dental caries was assessed using WHO criteria Decayed Missing Filled Treatment (DMFT) index and Periodontal status was estimated using the Community Periodontal Index (CPI). Analysis was done using Median test and Pearson correlation to compare SOC scores with dental parameters. Level of significance was set at 0.05.

Results: SOC scores ranged from a minimum of 22 to a maximum of 81. The mean SOC score is 52.8 ± 7.6 . There was no significant association between SOC and OHI(S), and mean DMFT. CPI and LOA were found to be significantly associated with SOC. The correlation test confirms that there is a significant weak correlation ($R = -0.094$; $p < 0.05$) between CPI and SOC, i.e., as SOC score increases, CPI score decreases. However, Correlation value is not significant in LOA vs SOC.

Conclusion: Although there was a significant relation only between SOC and CPI, the concept can be used to modify the oral health care behaviours to improve their quality of life.

Keywords: Sense of coherence (SOC); Dental caries; Oral Hygiene index; Periodontal; DMFT; CPI

1. Introduction

Health is influenced by various factors. The salutogenesis theory refers to the origins of health rather than disease, and emphasizes on factors that maintains health and health promoting processes [1]. The concept of Sense of Coherence (SOC) put forward by Aaron Antonovsky which explains the role of stress in human function is based on the salutogenesis theory [1,2]. Sense of coherence has three components comprehensibility, manageability, meaningfulness. "Comprehensibility" is the ability of people to understand what is happening around them; "manageability" is the extent to which people feel they are capable of managing the situation; and "meaningfulness" is the belief that things in life are interesting and a source of satisfaction [3]. In short, SOC is a logical factor that enables people to cope with stressors and successfully improve health [4].

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Various studies [3,5-7] have shown that people with stronger SOC are capable of handling all stresses in their social life as a result, there is a higher expectation for superior health status and quality of life. Freire et al (2001) [8] was the first to report the association between SOC and oral health. The study was conducted among 15-year adolescents living in Middle West Brazil and concluded that SOC is a psychosocial determinant of adolescent's oral health related behaviors affecting their pattern of dental attendance. In other words, people with stronger SOC maintain regular dental checkup [8], Clean their teeth more often [9] and have healthier dietary habits [10] compare to those with lower SOC. However, few related studies failed to report if any definite association exists between SOC and oral hygiene status, dental caries and periodontal status among the South Indian population. Hence this study was undertaken with the aim to assess the impact of SOC with Oral Hygiene, dental caries and periodontal status among young adults in Chennai, Tamil Nadu.

2. Materials and Methods

2.1. Study population

The study was conducted among 500 young adults of age group 19 to 23 years after obtaining ethical clearance from the Institutional Human Ethical Committee were the study was carried out. Informed consent was obtained before the start of the study. Individuals who were willing to participate in the study, who are able to read, understand and write English language, and, who signed the informed consent were included in the study. They were informed about the need of the study and that they have to fill up a questionnaire and examined clinically for the study. They were also informed that the examination will be done free of cost and their findings will be kept confidential. Individuals who were physically and mentally disabled, who were under antibiotics within last 3 months, who had any history of systemic illness, who visited a dentist within past 6 months for any dental treatment and who were under orthodontic treatment were excluded from the study.

The study sample was selected using multistage cluster random sampling. There are 5 town Panchayats in Thiruvallur district and 7 town Panchayats in Kanchipuram district in the Chennai Metropolitan area. 250 samples who fell into our inclusion and exclusion criteria were selected randomly in both the district from 2 randomly selected colleges.

The assessment sheet used for the study had 3 parts: Demographic details of the study subjects, SOC questionnaire and format for recording oral health status (OHI-S and DMFT).

2.2. SOC measure

SOC data were collected using 13 item standardized versions of SOC scale proposed by Antonovsky. Each question in the questionnaire has 7 options and scores ranging from 1 (extremely negative) to 7 (extremely positive). The sum of scores for SOC is 13 to 91. The higher the score, the stronger the SOC.

2.3. Oral health assessment

ADA specified Type III Clinical oral examination [11] was carried out with aseptic precautions using a plain mouth mirror, No.5 explorer and CPI probe under available natural light. Oral hygiene status was assessed using Oral Hygiene Index- Simplified (OHI-S) by John C Greene and Jack R Vermillion [12], Dental caries was assessed using WHO criteria Decayed Missing Filled Treatment (DMFT) index [13] and Periodontal status was estimated using the Community Periodontal Index (CPI) [13].

A pilot study was conducted among 25 patients who visited the dental college were the study was carried out prior to the study to calibrate the examiners for recording OHI-S, cavitated dental caries based on WHO criteria for recording dental caries and CPI. The kappa value for all three parameters was found to be > 90% indicating a strong agreement between the examiners. Data collected in the pilot study was not included in the main study.

2.4. Statistical analysis

Data obtained was entered into Microsoft Excel 2010 and transferred to a data editor page of SPSS version 16 software for statistical analysis. SOC scores were calculated by adding the 13 item SOC questionnaire with a seven-point Likert type scale with descriptive end points. Every item on a seven-point likert scale was scored ranging from 1 to 7. The sum of the scores for SOC is thus 13 to 91. The higher the score, the stronger the SOC. As there was no cutoff point to grade SOC scores, the scores were calculated for each individual. The samples will be separated into high and low based on the median score. Analysis was done using Median test and Pearson correlation to compare SOC scores with dental parameters. Level of significance was set at 0.05.

3. Result

The present study was carried out among 500 individuals of which 185 were males and 315 were females. The mean age of the study population was 20.43 years. SOC scores ranged from a minimum of 22 to a maximum of 81. The mean SOC score is 52.8 ± 7.6 . The median SOC score is 53. 240 individuals had high SOC scores greater than 53, while 260 had low SOC scores less than and equal to 53. Table 1 shows the association of SOC with all dental parameters studied.

Table 1 Comparison between SOC and dental parameters using median test.

| | | SOC (Median=53) | | N (n=500) | Median test | | Pearson correlation | |
|--------|------|--------------------|-----|--------------|-------------|-------|---------------------|-------|
| | | > 53 | ≤53 | | Value | P | R | P |
| OHI(S) | Good | 156 | 168 | 324 | 0.004 | 0.989 | -0.042 | 0.352 |
| | Fair | 83 | 90 | 173 | | | | |
| | Poor | 1 | 2 | 3 | | | | |
| DMFT | 0 | 37 | 36 | 73 | 0.23 | 0.632 | 0.042 | 0.351 |
| | ≥ 1 | 203 | 224 | 427 | | | | |
| CPI | 0 | 142 | 125 | 267 | 5.954 | 0.015 | -0.094 | 0.036 |
| | ≥ 1 | 98 | 135 | 233 | | | | |
| LOA | 0 | 234 | 259 | 493 | 6.554 | 0.01 | 0.02 | 0.651 |
| | ≥ 1 | 6 | 1 | 7 | | | | |

3.1. Oral Hygiene status

Table 1 shows that the majority, 324(64.8%), of the study population had good oral hygiene status, of which 156(48.1%) showed higher SOC. Statistical test shows there is no significant association between SOC and OHI(S) score.

3.1.1. Dental Caries experience

427(85.4%) of the study population were free of dental caries experience. The mean DMFT of the study population is 2.54. Table 1 shows no significant relation between SOC and mean DMFT.

3.1.2. Periodontal status

Table 1 shows that there is a significant association between CPI, LOA vs SOC. The correlation test confirms that there is a significant weak correlation ($R = -0.094$; $p < 0.05$) between CPI and SOC, i.e., as SOC score increases CPI score decreases. However, Correlation value is not significant in LOA vs SOC.

4. Discussion

Sense of coherence plays a major role in the achievement and maintenance of good health. Studies [14,15] have shown that there is a relationship between SOC and health outcomes. Antonovsky (1987,1996) [1,2] suggests three different pathways through which SOC promotes health. First, SOC confronts with the stressors and regulates the emotional tension. Secondly, it promotes health through practice of health promoting behaviours and lastly, by direct physiological consequence through the central pathways of the neuroimmune and the endocrine systems. Of the three pathways, the behavioural pathway was found to be relevant to most dental diseases. Previous studies had shown that a strong SOC is associated with more favourable dental behaviours[8,9,10] The present study was designed to investigate the impact of SOC with Oral Hygiene, dental caries and periodontal status among young adults in Chennai, Tamil Nadu.

CPI, LOA and DMFT indices are widely used to assess periodontal diseases and dental caries as recommended by the World Health Organization because all these indices simple to record, can be reproduced and are uniformly used internationally [13]. Hence, these indices were used to determine CPI, LOA and DMFT in this study.

The CPI scores showed a negative correlation with SOC, i.e., higher the SOC score lower the score of CPIS indicating a less risk for periodontal disease. The LOA score, although it showed significant association, correlation test was not significant. It should also be noted from this study that there is no significant association between Oral Hygiene status and SOC contradicting previous study done by Shilpa M et al (2016) [16].

Koga R et al (2020) [17] and Reddy KS et al (2016) [18] have conducted studies and reports similar findings. It has been proven in previous studies that higher SOC better the oral health care behaviours (tooth brushing, type of tooth brush used, brushing technique, materials used, frequency of brushing, use of oral hygiene aids, and visiting the dentist) [18,19,20]. These oral health care behaviour helps in maintaining good oral hygiene resulting in good oral health.

It is found in this study that there is no significant relationship between mean DMFT and SOC. This is similar to the study done by Shilpa M et al (2016) [16] and contradict to the study done by Freire MC et al (2001) [8]. The result was surprising as the theoretical hypothesis is that higher SOC results in good oral health. In DMFT, the Decayed component, D and Filled component, F can be considered to understand the individuals lack and awareness of knowledge about dental caries. It was found from this study that the mean Decay, 'D' score was higher than Filled, 'F' score. The differences in mean SOC levels between the DMFT scores were not large, and the ability of SOC to discriminate effectively may therefore be questioned.

The result of this study should be seen as one among the previous studies that examines possible psychosocial measurements at community level to understand an individual's ability to adopt healthy behaviour to maintain oral health. Although there was no causal relationship analyzed in this study as it is a cross-sectional study, the findings showed a negative correlation between SOC and LOA, i.e. lower the LOA score higher the SOC score. More studies in this area, if conducted, will help in adopting a holistic, salutogenic approach to oral health maintenance.

Our study has certain limitations. The study was limited to 19 to 23 years aged population. Hence the results cannot be generalized for all ages. Furthermore, the socioeconomic status of the study population, which has an influence over the outcome was not recorded for analysis. Further studies can be conducted among larger population among all age groups to understand how SOC is related to oral health.

5. Conclusion

Sense of coherence was found to have a negative correlation with Loss of attachment among 19 to 23-year-old young adults in Chennai city, Tamil Nadu, India. Though there was no significant relation between SOC and other dental parameters, the concept can be used to modify the oral health care behaviours to improve their quality of life.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all participants included in the study.

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