

Oral Health Related Quality of Life, Cognitive Ability, Nutritional Status Among Construction Workers- A Cross Sectional Study

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Abstract Introduction: Oral health defects significantly affect the individual's general health and ability to carry out everyday activities. People like farm workers, construction workers, and migratory workers do not have access to dental care, significantly influencing their overall quality of life. People with ongoing dental pain have nutritional deficiency consequences. **Materials and Method:** A questionnaire-based study was conducted among 420 construction workers in Chennai. Individuals who expressed a willingness to participate were enrolled in the study. The oral health-related quality of life was evaluated using the Oral Health Impact Profile -14 scale. The cognitive ability of the individuals was assessed using the Symptoms of Early Dementia 11 questionnaire, and the nutritional status was assessed using the Mini Nutritional Assessment. The results were tabulated and statistically analyzed using SPSS software. **Results:** A statistically significant association was found between Oral health-related quality of life ($p = 0.02$), cognitive ability ($p - value = 0.04$), and nutritional status of construction workers ($p - value = 0.01$). A strong positive correlation was found between the variables such as oral health-related quality of life and nutritional status. **Conclusion:** From this study, we can conclude that the oral health-related quality of life, cognitive ability, and nutritional status of the construction workers in Chennai is overall low, and importance to be given on their oral health and also general health since low nutritional status can affect their general health too.

Key Words Rheumatoid Arthritis, Depression, HAQ, BECK

1. Introduction

Oral health-related quality of life is a multi-dimensional concept that helps identify how oral problems have disrupted the individual's normal functioning. Regarding the WHO classification of impairment, disability, and handicap, Locker's conceptual framework for assessing oral health status aims to account for all potential functional and psychosocial effects of dental illnesses [1], [2]. Recent studies have shown that oral problems, like other ailments, have substantial emotional and psychosocial repercussions [3]–[5].

Clinical samples show that older people have higher rates of oral health, and cognitively impaired older adults, particularly those with dementia, had much more oral health issues on average. Older persons frequently experience cognitive impairment, which is frequently an early indicator of a progressive dementia illness like AD [6]–[9]. The impli-

cations of these findings may remain consistent irrespective of the root cause behind the low cognitive score. This holds even when distinguishing between individuals experiencing a decline from previous cognitive performance and those with enduring low cognitive function throughout their lives [10]–[12]. Additionally, as people age, their oral health (OH) declines, necessitating more preventive, restorative, and periodontal care. In older adults, poor oral health is frequently correlated with cognitive impairment. Recent research suggests that *Porphyromonas gingivalis*, an organism linked to chronic periodontitis, may contribute to both periodontitis and Alzheimer's disease by being found in the brains of patients with the disease [13], [14].

The general health and quality of life of the elderly are clearly impacted by malnutrition. The risk of malnutrition is primarily influenced by psychosocial issues related to aging,

including multiple disease states. The older population is highly susceptible to dietary limitations since they often have fewer natural teeth and may also have severe nutritional problems [15], [16]. The most significant nutritional issue affecting the senior population is malnutrition, which is linked to increased mortality, susceptibility to illnesses, and reduced quality of life. Nutrition and health, in general, are among the top concerns for the aged. The position and quantity of teeth affect mastication comfort and ease and whether or not dental prostheses are used [17], [18]. The wrong dietary choices and food textures may result in tooth loss to accommodate the dental condition. As a result, it can lessen appetite, which is thought to be a risk factor for malnutrition due to the loss of satisfaction from eating. Oral health conditions and poor masticatory function are recognized as risk factors for malnutrition [19]–[22].

Daily wage employees, such as construction workers, often lack dental care, which lowers their quality of life and increases their risk of developing nutritional deficiencies. The study's primary goal is to evaluate the nutritional status, cognitive function, and oral health-related quality of life among construction workers in Chennai.

2. Materials and Method

A questionnaire-based study was conducted among the 460 construction workers in Chennai from June 2022 to July 2022. The sample size was calculated using a 95% confidence interval and a prevalence of 45%. Participants were recruited based on multistage random sampling. Chennai was divided into four zones, and significant ongoing construction sites were randomly selected from each zone. From there, participants willing to participate in the study were selected. Participants who were willing to take part in the study were included in the study. Participants who were absent on the day of data collection and unwilling to participate in the study were excluded. Workers with systemic illness were also excluded. Approval from the Institutional Review Board at Saveetha University was secured in adherence to ethical standards. Participants were thoroughly briefed on the study's nature, and their informed consent was acquired before the commencement of the research.

The pre-validated questionnaire, which consists of 4 parts, was tested. Table 1 will be the demographic characteristics of the study participants. Table 2 consists of questions assessing oral health-related quality of life and 14 questions on a 5-point Likert scale Oral Health Impact Profile -14 scale (OHIP-14). The maximum score would be 56, which means a higher score lowers the quality of life. Table 3 consists of a dementia assessment questionnaire using symptoms of early dementia questionnaire-11, which contains yes/no questions. The Mini Nutritional Assessment (MNA), a clinical assessment instrument that does not require a dietician or nutritionist for its implementation, has been used to grade nutritional status and determine the risk of malnutrition in elderly patients. MNA is a highly sensitive, specific, and reliable approach that has undergone extensive validation.

Sl. No	Variable	n(%)
1	Age	
	<25 years	145(31.5%)
	26-35 years	89(19.3%)
	35-45 years	167(36.3%)
	>45 years	59(12.8%)
2	Education	
	Illiterate	56(12.1%)
	Middle school	89(19.3%)
	High school	176(38.2%)
	Undergraduate	139(30.2%)
3	Marital status	
	Unmarried	260(56.5%)
	Married	200(43.4%)
4	Working hours	
	<40 hours	44(9.5%)
	40-50 hours	101(21.9%)
	50-60 hours	145(31.5%)
	>60 hours	170(36.9%)
5	Occupation type	
	Workers/ production line	351(76.3%)
	Administrative	109(23.6%)
6	Self-assessment of oral health	
	Good	103(22.3%)
	Moderate	189(41%)
	Bad	168(36.5%)
7	Oral health-related quality of life	
	0-14 (Good quality of life)	121(26.3%)
	15-35 (Moderate quality of life)	156(33.9%)
	36-56 (poor quality of life)	183(39.7%)
8	Cognitive ability (SED-11Q)	
	0-4(Absence of dementia)	298(64.7%)
	5-8(Chance of dementia)	89(19.3%)
	9-11(Dementia)	73(15.8%)

Table 1: Demographic variables of the study participants

Table 4 consists of questions that determine cognitive ability (Symptoms of Early dementia-11 Questionnaire SED-11Q), which has yes/no types of questions. Yes can be scored 1, and No can be scored 0. More than score, less cognitive ability.

The results were collected and analyzed using SPSS version 23 (Statistical Packages of Social Sciences). Categorical variables were assessed for frequency, mean, and standard deviation. The association between variables was examined using the Chi-square test, while the correlation between variables was determined through Pearson correlation analysis. One-way ANOVA was used to find the association between the two independent groups. P value < 0.05 is considered significant.

3. Results

All the results are gather, see Table 1-5.

4. Discussion

According to the preamble of its constitution, the World Health Organization (WHO) defines health as "A condition of total physical, mental, and social well-being, not merely

	Association (Chi-square) a	Analysis of variance (One-way ANOVA) b
Age (years) and MNA score (Mean \pm SD)	0.04*	0.121
Education and MNA score (Mean \pm SD)	0.03*	0.03*
Working hours and MNA score (Mean \pm SD)	0.05*	0.016*
Oral health related quality of life and MNA score (Mean \pm SD)	0.00*	0.02*
Cognitive ability and MNA score (Mean \pm SD)	0.01*	0.00*

Table 2: Distribution of MNA results within age groups, education, working hours, OHRQOL and cognitive ability

	Association (Chi-square) a	Analysis of variance (One-way ANOVA) b
Age (years) and Cognitive ability	0.344	0.112
Education and Cognitive ability	0.02*	0.05*
Working hours and Cognitive ability	0.453	0.01*
Oral health related quality of life and Cognitive ability	0.04*	0.000*
MNA score (Mean \pm SD) and Cognitive ability	0.03*	0.412

Table 3: Distribution of cognitive ability results within age groups, education, working hours, OHRQOL and Mini nutritional assessment

	Association (Chi-square) a	Analysis of variance (One-way ANOVA) b
Age (years) and Oral health related quality of life	0.07	0.111
Education and Oral health related quality of life	0.02*	0.03*
Working hours and Oral health related quality of life	0.000*	0.01*
Cognitive ability and Oral health related quality of life	0.02*	0.05*
MNA score (Mean \pm SD) and Oral health related quality of life	0.04*	0.03*

Table 4: Distribution of Oral Health Related Quality of life results within age groups, education, working hours, cognitive ability and Mini

Variables	Pearson's correlation value(r)	P value
Oral health related quality of life and Mini nutritional assessment	0.144	0.035*
Oral health related quality of life and cognitive ability	0.233	0.004*
Mini nutritional assessment and cognitive ability	0.111	0.03*

Table 5: Correlation between Oral Health related quality of life, Mini nutritional assessment and cognitive ability

the absence of disease or infirmity." Dentistry has had little influence from recent changes in how health is defined and assessed. In its purely clinical approach to oral health, dentistry has continued to equate health with illness. This is why the evolving definition of health has unaffected the dental profession. Understanding that quality of life (QOL) measurements complement evaluating disease-related outcomes rather than replacing them [23], [24]. The term "OHRQOL" encapsulates the new perspective's aim: good oral health as the main objective of dental treatment. Oral illness and diseases can "...undermine self-image and self-esteem, impede normal social engagement, induce other health issues, contribute to chronic stress and melancholy, as well as incur substantial financial cost," according to the US Surgeon General. Additionally, they may obstruct daily activities like going to work and school, interacting with family members, and essential bodily processes like breathing, choosing what to eat, swallowing, and speaking. People compare their expectations and experiences to determine their HRQOL [25], [26].

In Table 5 analogous to ours, where the OHIP-14 was employed to gauge Oral Health-Related Quality of Life (OHQOL), the findings disclosed that 41.8% of partici-

pants manifested chronic gingivitis, 19.8% exhibited mild periodontitis, 23.3% displayed moderate periodontitis, and 15.3% presented with severe periodontitis. It is noteworthy that less than one-third of patients with gingivitis (32.9%) or mild periodontitis (31.6%) reported experiencing "Fairly often" or "very often" for one or more items on the OHIP-14. Conversely, approximately half of patients with moderate periodontitis (53.8%) reported a similar occurrence frequency.

Food consumption has a significant impact on morbidity and mortality, especially for the elderly, and nutrition has a significant role in quality of life. There is proof that xerostomia, poor oral health, and impaired chewing in the aged population all contribute to unintentional weight loss [27], [28]. Their teeth and oral health can impact people's nutritional condition. Particular tooth loss results in the loss of chewing ability, which makes it harder to chew items like fruits and vegetables, leading to people avoiding eating. In this way, poor oral health and a lack of prosthetic restorations may be major contributing causes of malnutrition. Based on findings from previous literature, undernourished individuals exhibited a higher prevalence of oral health problems ($p < 0.0005$) in comparison to well-nourished individuals [29]. The most prevalent oral health issue was identified in teeth

or dentures (48%). Additionally, undernourished patients frequently experienced problems related to the tongue (56%) and lips (44%). There was a correlation between oral health status and nutritional status, with a correlation coefficient of 0.32, resembling our study's findings, where the correlation between oral health status and nutritional status was observed to be 0.35.

Societal processes and socioeconomic features are thought to be the fundamental determinants of oral health, which affect oral health status and impact proximal risk factors of oral health. Cognitive dysfunction may result in poor self-care. Socioeconomic disparities in oral health might be caused by low cognitive capacity [30]. A preceding study observed that for each 1-point decrease in the Digit Symbol Substitution Test score, the predicted number of decayed teeth increased by 0.01, the number of missing teeth increased by 0.02, and the percentage of sites with periodontal disease increased by 0.02. Furthermore, sociodemographic characteristics, health behavior, and regular dental check-ups of individuals were significantly correlated with oral health, aligning with the context of the current study [1], [31], [32].

The study was conducted in a limited demographic area, which does not include people from other epidemiological areas and other races; this is the main limitation of the present study.

5. Conclusion

In conclusion, based on the present study, oral health directly affects individuals' quality of life, nutritional status, and cognitive ability. The oral health-related quality of life, cognitive ability, and nutritional status of the construction workers in Chennai are low overall, and importance should be given to their oral and general health since low nutritional status can affect their general health, too.

Conflict of interest

The authors declare no conflict of interests. All authors read and approved final version of the paper.

Authors Contribution

All authors contributed equally in this paper.

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