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Evaluation of oral health-related quality of life during the COVID-19 pandemic

Shirin Kolahdouz ¹, Mojtaba Soltanianzadeh ², Mina Soltanianzadeh ^{3,*} and Roghaye Hakimian ¹

¹ School of Dentistry, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

² Department of Oral and Maxillofacial Surgery, School of Dentistry, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

³ Department of Operative Dentistry, School of Dentistry, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

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Abstract

Objectives: This study aimed to analyze the quality of life associated with oral and dental health in patients referred to the Yazd Dental Faculty during the COVID-19 pandemic. The study utilized a cross-sectional design, assessing oral hygiene behaviors through a semi-structured questionnaire and conducting face-to-face interviews using the Oral Health Impact Profile-14 (OHIP-questionnaire developed by the World Health Organization (WHO)). The sample size comprised 251 participants.

Methods: The study employed a cross-sectional design to evaluate oral hygiene behaviors and Oral Health-Related Quality of Life (OHRQOL) using the OHIP-14 questionnaire. Participants underwent face-to-face interviews, and the data were collected during the COVID-19 pandemic. The mean age of the participants was 33.15±13.56 years, with 78.4% married and 21.6% single.

Conclusions: The mean OHIP-14 score was found to be 18.37, with variations observed across different studies. Patient age showed a significant association (p-value < 0.05) with Oral Health-Related Quality of Life (OHRQOL), while sex and marital status did not. Additionally, higher levels of dental anxiety and fear were associated with impaired oral health-related quality of life. Understanding these factors can help healthcare providers address patients' needs and improve oral health outcomes.

Keywords: Quality of life; Oral health care; COVID-19; Public health; OHIP questionnaire;

1. Introduction

Poor oral health is recognized as one of the most prevalent non-communicable diseases (NCDs) globally, contributing to approximately one-fifth of all out-of-pocket medical expenses [1, 2]. In 2017, it was estimated that nearly 3.5 billion individuals worldwide would be affected by oral disorders, with dental decay (caries) in permanent teeth being the most prevalent condition [3]. Studies suggest that approximately 44% of the global population has carious lesions in both primary and permanent teeth [4].

Dental caries is a common health issue worldwide and a significant cause of avoidable hospitalizations [5, 6]. Moreover, poor oral health has been linked to various chronic diseases such as diabetes, stroke, and cardiovascular disease [7, 8]. Social, economic, environmental, and political factors play a crucial role in oral health, and it is expected that the COVID-19 pandemic will have a significant impact [9, 10].

On March 11th, 2020, the World Health Organization declared the global spread of the coronavirus disease (COVID-19) a pandemic [11]. The ongoing pandemic has had a profound global impact, resulting in over 6.5 million recorded deaths

* Corresponding author: Mina Soltanianzadeh

[12]. To control the infection, various strategies such as mask usage, movement restrictions, physical distancing, vaccinations, and lockdown measures were implemented [13, 14]. The containment of the virus and minimizing its effect on healthcare systems became crucial [15].

In response to the COVID-19 pandemic, the UK government declared a state of emergency on March 23, 2020, leading to the suspension of all emergency and non-emergency dental care across primary, secondary, and tertiary facilities [16]. Consequently, patients experiencing acute oral damage, tooth pain, or indications of spreading dental infections had limited access to emergency dental care [17]. As a means to assess patients' conditions and provide remote therapy in the form of AAA (Advice, Analgesia, and Antimicrobial prescribing), primary general dentists were encouraged to offer remote triaging services to their patients [18]. Furthermore, the medications and treatments used to manage COVID-19 may adversely affect oral health, causing issues like dry mouth, stomatitis, and oral ulcers, particularly in individuals with compromised immune systems [19].

The relationship between health, overall well-being, and quality of life has evolved over time. Oral Health-Related Quality of Life (OHRQOL) has emerged as a reliable method to measure the impact of oral problems on individuals' attitudes and social functioning [20, 21]. OHRQOL encompasses the broader concept of how oral health influences one's ability to carry out daily activities. It is a multifaceted concept defined by Locker et al. as "the degree to which oral disorders affect functioning and psychosocial well-being" [22, 23]. OHRQOL is considered a Patient-Reported Outcome Measure (PROM). Additionally, understanding patient satisfaction with service delivery is crucial for continuous improvement of healthcare quality. Patient-Reported Experience Measures (PREMs) evaluate a service from the perspective of patients. While there has been extensive research on OHRQOL in individuals with dental diseases, fewer studies have examined the impact of the COVID-19 pandemic on OHRQOL [19]. Therefore, the aim of this study was to analyze the quality of life associated with oral and dental health in patients referred to the Yazd Dental Faculty during the study period (2021- 2022).

2. Materials and Methods

This cross-sectional study utilized a semi-structured questionnaire to assess oral hygiene behaviors, and face-to-face interviews were conducted to evaluate OHRQOL using the Oral Health Impact Profile-14 (OHIP-14) questionnaire. The OHIP-14 questionnaire, based on the World Health Organization (WHO) theoretical model, estimates the social burden of oral diseases. The seven dimensions of OHIP-14 include functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social impairment, and handicap. The questionnaire utilized a 5- point Likert scale for responses. Scores ranging from 0 to 56 were calculated by summing the ordinal values of the 14 items. Higher OHIP-14 scores indicate poorer OHRQOL, while lower scores suggest better OHRQOL. The level of patients' fear of dental treatment was measured using a ten-point Visual Analog Scale (VAS) ranging from low fear (1) to high fear (10). Additionally, participants were asked ten questions regarding COVID-19 exposure. A demographic questionnaire was used to gather information on sex (male or female), age (in years), and household income.

The sample size for this study was determined based on previous research estimating an 80% prevalence of dental care need in adults, with a 95% confidence level ($\alpha=0.05$) and a margin of error ($d=0.05$). The selected sample size was 251 individuals. The inclusion criteria for the study included adults aged 18 years and above, without systemic diseases, and no history of mental illness.

2.1. Statistical Analysis

The statistical analysis was performed using IBM SPSS Statistics, version 25. Descriptive data were presented as frequencies (percentages), means, and standard deviations. Pearson chi-square and t- tests were used to compare demographic information and responses to yes-or-no questions.

3. Results

A total of 250 individuals (133 women, 117 men) participated in the study. The demographic characteristics of the participants are summarized in Table 1. The mean age of the participants was 33.15 ± 13.56 years. Among the participants, 78.4% were married, while 21.6% were single.

Table 1 Demographic characteristics of participants

Variable	Categories	Frequency	
		Frequency	Percent
Age		33.15±13.56	
Gender	Man	117	46.8
	Woman	133	53.2
Marital status	Married	196	78.4
	Single	54	21.6

The mean OHIP-14 score of the 250 patients was found to be 7.2 (Table 2). Significant differences were observed in total sum scores ($p < 0.001$) and six out of the seven domains based on the patients' assigned care level. The social disability dimension exhibited the highest score, while the physical disability dimension had the lowest score.

Table 2 The mean±SD of OHIP-14 domains and sum score in the patients (n= 250)

OHIP-14 dimensions	Mean ± SD
Functional limitation	2.65±1.39
Physical pain	2.31±1.19
Psychological discomfort	3.01±1.02
Physical disability	1.68±1.13
Psychological disability	2.77±1.51
Social disability	3.05±1.88
Handicap	2.93±1.46
OHIP-14 total score	18.37±3.01

Table 2 presents the OHIP-14 total scores and domain scores according to age, gender, and marital status. The study findings indicate that there were significant differences in OHRQOL, as measured by the OHIP-14 total scores, based on patient age (p -value < 0.05). However, there were no significant differences in OHIP-14 total scores based on gender and marital status (p -value > 0.05).

When comparing the scores based on age, significant differences were observed in the social disability, physical disability, physical pain, psychological discomfort, and handicap dimensions (p -value < 0.05). This suggests that different age groups experienced varying levels of impact on these specific aspects of oral health-related quality of life.

Regarding gender, there were significant differences in the functional limitation, physical disability, and psychological disability dimensions scores (p -value < 0.05). This indicates that males and females may have experienced different levels of limitations and disabilities in these particular domains.

In terms of marital status, no significant differences were found in the scores of all dimensions (p -value > 0.05). This suggests that marital status did not significantly influence the reported impact on different aspects of oral health-related quality of life.

Table 3 The mean±SD and comparison of quality of life score associated to oral health in the patients according to age, gender and marital status

OHIP-14 dimensions	Age			Gender			Marital status		
	30<	>30	p-value	Man	Woman	p-value	Married	Single	p-value
Functional limitation	2.78±1.45	2.95±1.19	0.069	2.95±1.61	2.41±1.26	0.041	2.79±1.35	2.85±1.38	0.51
Physical pain	2.35±1.24	2.91±1.09	0.031	2.44±1.28	2.15±1.05	0.56	2.52±1.23	2.45±1.19	0.66
Psychological discomfort	2.98±1.01	3.58±1.81	0.042	3.11±1.56	2.86±1.50	0.061	3.24±1.86	3.10±1.75	0.12
Physical disability	1.59±1.05	2.25±1.17	0.002	1.98±1.13	2.33±1.14	0.002	1.89±1.09	2.12±1.19	0.25
Psychological disability	2.56±1.45	2.89±1.63	0.056	2.15±1.09	2.89±1.29	0.001	2.95±1.32	2.63±1.23	0.062
Social disability	3.12±1.95	3.32±1.88	0.041	2.62±1.13	2.75±1.21	0.55	2.80±1.32	2.91±1.14	0.09
Handicap	2.02±1.53	2.88±1.23	0.001	2.88±1.51	2.91±1.53	0.61	3.23±1.65	3.12±1.60	0.11
OHIP-14 total score	17.40±2.55	20.78±2.68	0.001	18.13±2.43	18.0±2.91	0.071	19.42±3.15	19.18±3.15	0.65

Table 4 displays the mean ± SD of the quality of life scores associated with oral health in the patients categorized according to their fear of dental treatment. Overall, the OHRQOL during the COVID-19 pandemic, as indicated by the OHIP-14 total scores, showed significant differences. The results demonstrated that the OHIP-14 total score was significantly different based on the level of fear of dental treatment (p-value > 0.05).

Additionally, significant differences were observed in the scores of all dimensions, except for the functional limitation and physical pain dimensions (p-value < 0.05). This implies that patients' fear of dental treatment had a notable impact on various aspects of their oral health-related quality of life, including social disability, physical disability, psychological discomfort, psychological disability, social impairment, and handicap.

Table 4 The mean±SD and comparison of quality of life score associated to oral health in the patients according to fear of dental treatment

OHIP-14 dimensions	Fear of dental treatment (0-10)		
	5<	>5	p-value
Functional limitation	2.88±1.51	1.98±1.01	0.069
Physical pain	2.71±1.32	2.08±1.11	0.055
Psychological discomfort	2.85±1.23	2.15±1.20	0.015
Physical disability	2.68±1.41	1.77±1.02	0.011
Psychological disability	2.85±1.36	2.12±1.10	0.008
Social disability	3.08±1.85	2.23±1.23	0.021
Handicap	3.22±1.81	2.55±1.15	0.001
OHIP-14 total score	20.27±3.47	14.88±1.65	0.001

4. Discussion

This study aimed to investigate the quality of life associated with oral and dental health in patients. The mean rank scores of OHIP-14 were reported as 18.37 in our study. A study by Agrawal et al. (2017) conducted among Nepalian populations reported a mean OHIP-14 score of 12.19 [24]. In another study by Razzak et al. focusing on patients visiting the Endodontics and Prosthodontics clinic, the mean rank score of OHIP-14 was found to be 53.27 [25]. The variations in results across studies could be attributed to different study populations, including differences in patient demographics, settings, and the severity of oral problems. It is important to note that individuals may perceive and experience OHIP-14 differently, and the scores can vary depending on the severity of their oral issues [25].

When analyzing the effect of independent variables, we found that sex and marital status were not significantly associated with the OHIP-14 total score (p -value > 0.05). However, patient age showed a significant difference in OHRQOL during the COVID-19 pandemic, as indicated by the OHIP-14 total scores. Feu et al. found no association between gender and age with OHIP-14 scores in their study [26]. Similarly, a study by Masood et al. reported no significant difference in mean OHIP-14 scores based on age, gender, and marital status [27]. In contrast to our findings, Ulinski et al. identified a negative impact on OHRQOL associated with the female gender and age among sociodemographic variables [28]. Consistent with previous evidence suggesting that oral health worsens with aging [29], our study found a significant association between age and the OHIP-14 total score. Similar results were reported by McGrath and Bedi [30] and Steele et al. [31], suggesting that the elderly become more tolerant towards oral health problems associated with aging [32]. It is important to note that gender differences in quality of life cannot be solely explained by assessing oral health status. Other factors such as mental health, work status, and societal roles come into play when considering quality of life between genders [25]. The variations in results among different studies may be attributed to differences in the tools used, sample sizes, variations in the studied populations, or other demographic characteristics. Therefore, further ecological studies are needed to clarify these findings.

Our results also demonstrated a significant difference in the OHIP-14 total score based on the fear of dental treatment. Consistent with this finding, previous studies have reported a low to moderate relationship between OHRQOL and dental anxiety, with individuals experiencing higher levels of dental anxiety/fear suffering from impaired OHRQOL [33]. Another study revealed a strong negative correlation between dental anxiety and total OHIP-14 scores, with decreased OHRQOL observed in individuals with higher levels of dental anxiety [25]. Dental anxiety and fear are concerning issues that impact a significant number of individuals across different social groups and age ranges [25]. A study found that dentally fearful patients reported significantly higher impairment of OHRQOL compared to subjects with lower or no fear [34].

5. Conclusion

This study aimed to investigate the quality of life associated with oral and dental health in patients during the COVID-19 pandemic. The mean rank scores of OHIP-14, a questionnaire measuring oral health-related quality of life, were found to be 18.37 in this study. The study found that patient age showed a significant difference in oral health-related quality of life during the pandemic, while sex and marital status did not have a significant association. Older individuals were more tolerant towards oral health problems associated with aging. Gender differences in quality of life could not be solely explained by oral health status, as other factors such as mental health and societal roles played a role.

The study also revealed a significant difference in OHIP-14 scores based on the fear of dental treatment. Higher levels of dental anxiety and fear were associated with impaired oral health-related quality of life. Dental anxiety and fear affected individuals across different social groups and age ranges, with dentally fearful patients experiencing greater impairment.

Overall, this study highlights the importance of considering individual factors and experiences when assessing the quality of life related to oral and dental health. By understanding these associations, healthcare providers can better address patients' needs and improve oral health outcomes. Further research is needed to explore the relationships between oral health-related quality of life and demographic characteristics, as well as the impact of dental anxiety and fear on overall well-being.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

Statement of informed consent

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

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