Oral Health Related Quality of Life in Patients Infected With HIV, IRAN: A Cross Sectional Study

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Abstract

Background: In recent years, life expectancy of patients with Human Immunodeficiency Virus (HIV) increased. They experienced oral manifestations that could affect their Oral Health Related Quality of Life (OHRQoL). This study was conducted to evaluate OHRQoL in the patients and its related factors.

Methods: In this cross-sectional study, using simple random sampling, we selected 250 patients with HIV from Shiraz Voluntary Counseling and Testing center in 2019. To evaluate their OHRQoL, we used Geriatric Oral Health Assessment Index revised for patients with HIV. We assessed the association between the patients' OHRQoL and demographic characteristics.

Results: The mean score of the patients' OHRQoL was 24.50 ± 6.25 . The worst and the best scores were in psychosocial and pain categories, respectively. In univariate analysis, the OHRQoL significantly associated with the patients' age ($p=0.005$), duration of disease ($p=0.008$), job ($p=0.010$), edentulous status ($p=0.002$), and wearing denture ($p<0.001$). However, in multiple linear regression analysis, we found only a significant difference between participants wearing and not wearing denture ($p<0.001$).

Conclusions: The participants declared that they satisfied from averagely 70% of items of OHRQoL. The OHRQoL was significantly better in the patients wearing denture. The finding highlighted the importance of fulfillment of dental needs on improving

OHRQoL. Therefore, planning of dental services for patients with HIV is essential so that they have timely access to oral health care. Furthermore, authorities should consider denture as an unmet need in the patients and provide facilities to help the patients to become denture owners.

Background

Quality of life is the persons' understanding of their living conditions in the cultural context and value system in which they live (1). Health related quality of life (HRQoL) consists of those aspects of quality of life that are influenced by the presence of disease or treatment (1). Oral health related quality of life (OHRQoL) is defined as the impact of oral conditions on people's everyday life (2). World Health Organization recognizes this multidimensional concept as an important part of general and oral health and identifies it as an important part of the Global Oral Health Program (3). It becomes measurable by providing a score by using questionnaires (2).

Health problems could affect patients' quality of life (4). Therefore, in recent years, to assess the impact of chronic diseases on patients, researchers evaluated HRQoL. Infection with Human Immunodeficiency Virus (HIV) was recognized as one of the most important public health problems in the world. In recent years, because of new therapeutic measures, life expectancy of the patients infected with HIV increased. Nevertheless, because of several health-related outcomes, which led to chronic comorbidities, their HRQoL was poor (5). In addition, many of the patients suffered from oral health problems and experienced at least one oral disease during their illness (6). The oral manifestations could compromise

important activities of daily living such as ability to chew and swallow food comfortably, to speak, and to interact socially (7). Therefore, HIV infection could affect OHRQoL (6, 8). To assess OHRQoL, researchers developed several questionnaires from the 1980s onward, much of which focused on the elderly. One of them was Geriatric Oral Health Assessment Index (GOHAI), a self-reported measure originally designed for older adults. In 2002, Coulter and coworkers modified GOHAI to use it for assessing OHRQoL in patients with HIV. They removed items that were specific to the elderly and added items relevant for HIV disease (7). Several studies evaluated OHRQoL in HIV infected patients. In a study conducted in Malaysia, the impact of oral diseases was greater for HIV infected patients than for general population. They found the greatest impacts in the discomfort due to food being stuck and difficulty in chewing food (6). A study conducted in Brazil also showed a high prevalence of frequent/very frequent impact on OHRQoL in children and adolescents with HIV (8). In a study conducted in the United States, the OHRQoL in HIV infected women was 10% poorer than that in HIV uninfected women (9). Parish and coworkers showed a strong positive association between poor OHRQoL and unmet dental needs in women living with HIV. They recommended dentists to consider OHRQoL evaluation in management of the patients to detect those who had significant oral health impacts (10).

In Shiraz, there was a modern center for managing patients with HIV. The patients received several services including dental services from the center. To provide services compatible with the patients' needs, authorities required information about the patients' OHRQoL. Therefore, this study was conducted to evaluate OHRQoL in patients infected with HIV and its related factors in Shiraz.

Methods

In Iran, all patients infected with HIV should refer to Voluntary Counseling and Testing (VCT) center to receive necessary prophylactic and therapeutic measures. The target population of this cross-sectional study was the patients infected with HIV and being under follow-up of the VCT center affiliated to Shiraz University of Medical Sciences in 2019. However, we excluded the patients that were prisoner and those that no telephone number was recorded for them because they were not available. Other our exclusion criteria were under three-year-old patients, and those that did not consent to participate in the study or did not have adequate cooperation.

To determine sample size, we conducted a pilot study on 18 of the patients. Considering the results of the study, $\alpha = 0.05$, and $d=1$, we calculated the sample size as 163 patients. However, we increased the sample size to 250 to be adequate for achieving other objectives of the study and to compensate the possible exclusion of some patients from the study. The code numbers of all patients being under follow-up of Shiraz VCT center had been recorded in Iran national software for control of HIV/AIDS. Using SPSS software, we selected 250 of them by simple random sampling.

One of the personnel of the VCT center called the selected patients. She asked those consented to participate in the study to refer to VCT center in a scheduled time. To increase the number of patients consenting to participate in the study, she gave them adequate information about the research and its

objectives. Moreover, she emphasized on the confidentiality of the obtained information. Also, she explained that some money would pay to the participants to compensate one day's absence of work and the charge of transferring to the center. Despite, if the selected patients did not consent to participate in the study, we would randomly select other patients by using Iran national software for control of HIV/AIDS. To evaluate OHRQoL in the selected patients, we used modified version of the Geriatric Oral Health Assessment Index that was revised for patients infected with HIV (7). The questionnaire consisted of seven questions in four categories; i.e. oral and psychosocial functions, pain, and social activity. Two questions evaluated each of the first three categories and one question assessed that how much patients' oral health interfered with their social activities (Table 1). Response options of the questions were a five-point scale; i.e. all, most, some, a little, and none of the time. Each question was scored from 1 to 5. Summing up the scores of the questions, we scored each questionnaire from 7 to 35; the higher the score, the better the OHRQoL. To compare the score of OHRQoL with that of each question, we standardized all scores from 0 to 100%. The reliability of the English version of the questionnaire had been confirmed in a previous study (7). However, we translated the questionnaire to Farsi and evaluated the reliability, and qualitative and quantitative face and qualitative content validity of the Persian version. Conducting a pilot study and using a cronbach, we confirmed its reliability ($\alpha=0.83$). Evaluating qualitative face validity, we asked 15 faculty members of Shiraz University of Medical Sciences to assess the sentences used in each question regarding difficulty level, appropriateness, ambiguity, and relevance to the main purpose. Using their opinions, we edited the problematic sentences. Afterwards, the faculty members confirmed the face validity of the questionnaire. Evaluating quantitative face validity, we interviewed with the 18 participants to score the importance of each question of the questionnaire. The face validity was determined by using item impact method. In this method, we scored the importance from 1, not important at all, to 5, completely important. Impact scores of the questions were measured by using formula: percentage of participants who gave each item scores as 4 or 5 $\times$ mean of importance score for each question. An impact score ≥ 1.5 was considered appropriate (11). In our study, all the questions were scored ≥ 1.5 ; therefore, no question was deleted. Evaluating qualitative content validity, we asked 18 experts in dentistry and nursing to express their views about questionnaire regarding the grammar, use of proper words, and placement of items in proper place. Afterwards, we corrected the questionnaire according the experts opinions and they confirmed its content validity. Explaining adequately about the questions of the questionnaire and making their meaning clear, the staff of VCT center interviewed with all the participants. Furthermore, asking the patients and searching in the patients' records, she noted their demographic and health characteristics.

The collected data were analyzed with SPSS software version 20. To evaluate the association between the patients' OHRQoL and their demographic and health characteristics, we used Pearson correlation, one way ANOVA, and independent sample T test. To control the effect of possible confounding factors, we entered all the variables in a multiple linear regression model with OHRQoL as dependent variable. In all the analysis, an alpha level of 0.05 was regarded as statistical significance.

Researchers carried out all stages of the research in accordance with Declaration of Helsinki. The Research Ethics Committee of Shiraz University of Medical Sciences reviewed and approved the study

protocol. As we recorded the patients' information based on their code in the HIV/AIDS national software, they were unidentified for our research team and their information was kept confidential. However, informed consent was obtained from all participants or, if they were under 18 years old, from their parents and/or legal guardians.

Results

Of the 250 selected patients, 222 (88.8%) participated in the study. 15 uncooperative patients were excluded from the study. As 8 questionnaires were not filled up completely, we did not enter their data. Furthermore, 5 selected patients were excluded because no telephone number was recorded for them in VCT center.

Of 222 participants, 151 (68.02%) were male individuals. The age of the participants varied from 7 to 73 years and its mean was 39.68 ± 8.62 . They were diagnosed to be HIV⁺ from 1996 to 2019; therefore, the duration of their disease varied from 1 to 24 years with the mean of 7.61 ± 4.21 years. Although they had up to 8 children, 53.2% of them did not have any children (Table 2 & 3).

The mean scores determined for each question of OHRQoL varied from 2.39 ± 1.50 to 4.33 ± 1.05 . The worst and the best scores were in psychosocial and pain categories, respectively. Although each patient's overall OHRQoL varied from 11.00 to 35.00, the mean score of the OHRQoL was 24.50 ± 6.25 (Table 1).

In univariate analysis, we could not show a significant difference between the OHRQoL of women and men ($p=0.498$). In addition, there was not a significant association between the participants' OHRQoL and many of their characteristics such as the route of HIV transmission ($p=0.531$), cigarette or hookah smoking ($p=0.192$), alcohol drinking ($p=0.931$), addiction to smoked and injected illegal drugs ($p=0.233$ and $p=0.339$, respectively). However, the analysis showed that the OHRQoL significantly improved by increasing age and duration of disease ($p=0.005$ and $p=0.008$, respectively). Moreover, it showed that edentulous participants and those wearing partial or complete denture had better OHRQoL ($p=0.002$ and $p<0.001$, respectively). Furthermore, participants having a permanent job and students had better OHRQoL ($p=0.010$, Table 2 & 3). However, in multiple linear regression analysis, we found only a significant difference between participants wearing and not wearing partial or complete denture ($p<0.001$). And, we could not show a significant association between the other variables and OHRQoL (Table 4).

Discussion

This cross-sectional study evaluated OHRQoL and its risk factors in patients living in Shiraz and infected with HIV. They declared that in the last 4 weeks, they satisfied from averagely 70% of asked items of OHRQoL. The worst and best satisfactions were from their concern about mouth problems and frequency of medication use, respectively. After controlling the confounding factors, we found that the patients wearing partial or complete denture had better OHRQoL than those not wearing.

In our study, the patients infected with HIV acquired more than two third of OHRQoL scores. Various studies had used different instrument for evaluating OHRQoL in patients with HIV; therefore, the comparison of their results was so difficult. However, the studies revealed that patients infected with HIV experienced a significantly worst OHRQoL for total and every dimension than general population. This difference was evident even though the groups were similar in their socioeconomic backgrounds and health behavior risk factors (6, 9, 12, 13). The patients' OHRQoL was reported poorer than those suffering from other diseases such as phobic dental anxiety, dentofacial deformity, and xerostomia (9). Studies also revealed that the patients' OHRQoL improved over time (10, 12). Therefore, positive changes happened in oral health access and coverage over time. It maybe because of decreasing in stigma and discrimination historically associated with HIV, and greater willingness of dental practitioners to provide dental care (10). A previous study also showed that participants with oral symptoms had poorer OHRQoL than those without the symptoms (6). Therefore, poor results of OHRQoL in patients with HIV reported from several studies (8, 14, 15) supported the hypothesis that the patients had significant oral health needs. In addition, studies showed that patients living with HIV in the United States and Malaysia had much better OHRQoL than the patients in our study (6, 10). The finding highlighted the importance of establishing programs to improve oral health access for the patients in Iran. A study provided evidence of an important link between oral health and general health. This finding highlighted the importance of collaboration between medical and dental professionals to improve the delivery of oral health care services to patients with HIV (6).

We found the worst OHRQoL scores in psychological category. The participants reported that in about half of the times in the last 4 weeks, they were worried or concerned about problems with their mouth. Mohamed and his coworkers also found that the most affected OHRQoL category in adults living with HIV/AIDS in Malaysia was psychological discomfort. "Discomfort due to food getting stuck between teeth or dentures" was the item within the psychological discomfort category that had the highest impact on OHRQoL (6). We also found the best OHRQoL scores in pain category and then social category. Most of our participants reported that in the last 4 weeks, they did not use or use a little medication to relieve pain or discomfort with their mouth. In contrast, Parish and coworkers found the highest impact on OHRQoL for the items assessing the presence of painful aching in the mouth and discomfort while eating (10). Similar to our study, Mohamed and his coworkers study, also, showed the lowest oral impact was for social disability so that no participant reported having impacts of 'fairly often' or 'very often' for "avoided going out" (6). In Adeniyi and coworkers study and Massarente and coworkers study, oral symptoms was identified as one of the most affected categories of OHRQoL (16, 17). There were some reasons for the different result of the studies. Different cultures of people living in different countries, establishing different health promotion programs for patients with HIV, and using various instruments for evaluation of OHRQoL in different studies were some of the reasons.

In our study, similar to other studies (5, 8, 16, 17), there was not a significant difference between female and male individuals' OHRQoL. Nevertheless, in Tomar and coworkers study, women had worse OHRQoL than men (15). Although we found a significantly positive correlation between patients' age and their OHRQoL, the correlation was not confirmed in regression analysis. Also, we found a controversy in this

regard in literature. Some studies revealed that older age was associated with worse OHRQoL (8, 10). Nevertheless, other study could not show a significant association between the patients' age and their OHRQoL (16).

Evaluating socioeconomic factors, we could not show any association between OHRQoL and factors such as the patient's marriage status and education, and the number of children in the family. Furthermore, although a significant association between the patients' job and their OHRQoL was shown in univariate analysis, it was not confirmed in regression analysis. Other studies also could not show a significant association between the patients' OHRQoL and the following socioeconomic factors: income per capita (8), number of people residing in the family home (8, 17), education level (8), children's height-for-age ratio (2), household ownership (17). In contrast, studies showed worse OHRQoL for the unemployed (4, 7, 15), brown or black people (4), and those with lower education level (7) and lower personal monthly income (6, 7, 9, 10, 18). Also, studies showed that the patients with HIV that had adequate social support experienced better OHRQoL (10, 17). For example, the children having their own mother as caretaker had better OHRQoL (17). In addition, the patients with low social support that had symptoms of anxiety, depression, and loneliness experienced lower OHRQoL than those without the symptoms (10).

In our study, similar to other studies (8, 15) the patients' OHRQoL was not significantly associated to duration of disease. Also, we could not show a significant association between the patients' OHRQoL and their rout of HIV transmission. In contrast, Coulter and coworkers found that among patients infected with HIV, homosexual men had better OHRQOL than intravenous drug abusers (7). While a study explained that no HIV-related variables predicted OHRQoL (18), other studies showed that factors such as viral load (4, 17), CD4 cell counts (9), and AIDS diagnosis (7) that indicated severity of HIV infection were significantly associated with the patients' OHRQoL. Also, use or not use of antiretroviral therapy (4) and duration of the use (9) were found to be related to the patients' OHRQoL.

Although several other studies (7, 9, 10, 15, 18) showed significant association between cigarette smoking and OHRQoL in patients with HIV, our study could not confirm the association. Low OHRQoL in cigarette smokers is likely due to the direct dental problems such as tooth loss and mucosal inflammation caused by smoking. In addition, we could not show that the patients' OHRQoL was significantly associated to alcohol drinking. However, other studies showed that alcohol consumption had a negative impact on OHRQoL of people with HIV (4, 9). Also, our study could not show a significant association between the patients' OHRQoL and history of being in prison. In contrast, Tomar and coworkers showed poorer OHRQoL for those living in temporary housing, prison, or other institutional settings (15). The observed differences between the results might be because of different design of the studies and evaluation of different confounding factors in the studies.

In our study, the edentulous patients had significantly better OHRQoL than those had at least one tooth in their mouth in univariate analysis. However, we could not confirm the association after controlling the confounding factors in multiple regression analysis. In contrast, Mulligan and coworkers showed that

total number of teeth was significantly related to OHRQoL so that each additional tooth was associated with a 1% improvement in OHRQoL scores (9). In addition, in our study, those wearing denture had significantly better OHRQoL than those not wearing. Also, the wearing denture was the only factor with significant association with OHRQoL in multiple regression analysis. In contrast, Jeganathan and coworkers study found that the patients wearing a removable denture had worse OHRQoL than those with natural dentition (18). The difference between the results of these studies and our findings might be because of the high proportion of decayed and bad quality teeth in our patients' mouth that led to oral symptoms. Mohamed and his coworkers showed that a cavitated tooth and toothache were significantly associated with reduced OHRQoL (6). In addition, the difference might be because of high proportion of patients that needed denture but could not buy it. Soares and coworkers found an association between need for dentures and worse OHRQoL (4). Parish and coworkers showed that unmet dental needs had the strongest positive association with poor OHRQoL and the fulfillment of dental needs could have a positive impact on the OHRQoL (10). Rovaris and coworkers study showed that the children living with HIV had high dental treatment need and as a result poor OHRQoL (8). Therefore, although the care of the patients living with HIV significantly improves recently, there are still important challenges regarding their management and treatment. This highlights the need for establishment of multidisciplinary interventions in this regard.

To improve OHRQoL in patients living with HIV, we recommend authorities to design health programs to improve the knowledge of caregivers on the importance of oral health in the patients. For better health outcomes, dentists should also be included in the team managing the patients. Dentists should implement OHRQoL assessments in their management of the care of patients with HIV to identify those who had significant oral health impacts (9). Public healthcare programs should establish for better prevention and treatment of dental and oral problems in this vulnerable population. Regarding high proportion of edentulous patients in this population, authorities should consider denture as an unmet need in the patients and provide facilities to help the patients to become denture owners. A study showed that there was a significant positive association between OHRQoL and general HRQoL (7). Therefore, improving the patients' OHRQoL can improve their general HRQoL and as a result can lead to health promotion.

Limitations

Despite our great efforts to conduct a well-designed study, this study had some limitations. The most important was the cross-sectional design of the study. The design caused that inferences could not be made about the directionality of the noted associations. Although the participants of our study were restricted to those registered in a single VCT center, the center was the only referral center for the patients living with HIV within Shiraz. According to guidelines in Iran, all patients infected with HIV should refer to a VCT center. Therefore, our findings might be applicable to patients with HIV in Shiraz. However, those patients that did not attend in a center for follow-up care did not participate in our study. Because patients without regular follow-up care might have relatively worse health status than those under the

follow-up, our finding might overestimate. Other limitations of our study were recall and social desirability biases because our questionnaire was based on self-reported data and was administered by interviewers.

Conclusions

Assessment OHRQoL among patients with HIV is important because it highlights their perceived needs and contributes to the planning of appropriate programs for improving their oral health. Our study showed that the patients' OHRQoL was not optimal. For example, it showed that most of the patients worried about problems with their teeth and mouth. It also revealed that the OHRQoL was significantly better in the patients wearing partial or complete denture. This finding might be because of high proportion of decayed and bad quality teeth in our patients' mouth and high proportion of patients that needed denture but could not buy it. The finding highlighted the importance of fulfillment of dental needs on improving OHRQoL. Therefore, we recommended collaboration between medical and dental professionals to improve the delivery of oral health care services to the patients. The professionals should pay attention to the patients' dental and oral treatment needs. Furthermore, authorities should consider denture as an unmet need in the patients and provide facilities to help the patients to become denture owners.

Abbreviations

OHRQoL, Oral Health Related Quality of Life; HIV, Human Immunodeficiency Virus; VCT, Voluntary Counseling and Testing; ANOVA, analysis of variance.

Declarations

Ethical approval and consent to participate

Researchers carried out all stages of the research in accordance with Declaration of Helsinki. Informed consents were obtained from all participants or, if they were under 18 years old, from their parents and/or legal guardians. The Ethics Committee of Shiraz University of Medical Sciences approved the study (≠IR.SUMS.REC.1394.S809). As we recorded the patients' information based on their code in the HIV/AIDS national software, they were unidentified for our research team and their information was kept confidential.

Consent to publish

Not applicable.

Availability of data and materials

The datasets during the current study are not publicly available due to confidentiality of the patients' data, but they will be available upon editorial reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Author's contributions

SSh participated in study design, data collection, and data analysis, and writing the first draft and correcting the final draft of the manuscript. SE participated in interpretation of results and write the first draft of the article. MH participated in data collection and cooperated in manuscript writing. All authors read and approved the final manuscript.

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Tables

Table 1: Participants' oral health related quality of life (N=222)

Category	Questions	Scores (Mean±SD)	Standardized Scores (Mean±SD)
Pain	In the last 4 weeks, how much of the time did you have pain or discomfort with your mouth, tongue, teeth, or gums?	4.02±1.24	80.36±24.80
Pain	In the last 4 weeks, how much of the time did you use medication to relieve pain or discomfort with your mouth, tongue, teeth, or gums?	4.33±1.05	86.67±21.07
Function	In the last 4 weeks, how much of the time were you able to swallow comfortably?	3.43±1.26	68.56±25.18
Function	In the last 4 weeks, how much of the time did you limit the kinds or amounts of foods you ate because of problems with your mouth, tongue, teeth, or gums?	3.65±1.33	73.06±26.71
Social	In the last 4 weeks, how much of the time did your oral health interfere with your social activities?	4.18±1.17	83.60±23.49
Psychosocial	In the last 4 weeks, how often were you worried or concerned about problems with your mouth, tongue teeth, or gums?	2.39±1.50	47.75±30.04
Psychosocial	In the last 4 weeks, how much of the time were you pleased or happy with the look of your mouth, teeth, or gums?	2.50±1.57	50.00±31.48
Overall oral health related quality of life		24.50±6.25	70.00±17.86

SD: Standard Deviation

Table 2: Participants' qualitative characteristics and the relationship between the characteristics and their oral health related quality of life (N=222)

Participants' characteristics	Measures	OHRQoL (Mean±SD)	P value
Sex, N (%)			0.498 [¶]
Female individuals	71 (31.98)	24.08 ±6.35	
Male individuals	151 (68.02)	24.70 ±6.21	
Marriage status, N (%)			0.439 ^{¶¶}
Single	77 (34.68)	24.04±5.79	
Married	84 (37.84)	25.19±6.31	
Divorced or widowed	61 (27.48)	24.13±6.73	
Patient's education, N (%)			0.439 ^{¶¶}
0< <5 year education	91 (40.99)	24.13±5.99	
6≤ <12 year education	89 (40.09)	24.73±6.43	
Having a diploma degree or university education	42 (18.92)	24.27±6.48	
Patient's job, N (%) [*]			0.010 ^{¶¶}
Unemployed or having a temporary job	118 (53.15)	24.18±6.18 ^a	
Student or having a permanent job	36 (16.22)	27.30±6.24 ^b	
Homemaker	68 (30.63)	23.57±6.04 ^a	
Rout of HIV transmission, N (%)			0.531 ^{¶¶}
Using share syringe by IV-drug abusers	128 (57.66)	25.05±6.41	
Sexual contact outside the family	46 (20.72)	23.93±5.93	
Transmission from her/his HIV+ spouse	37 (16.67)	23.67±6.41	
Mother-to-child transmission	3 (1.35)	20.67±3.78	
Other routs	8 (3.60)	24.12±5.25	
Smoking cigarette or hookah (up to now), N (%)			0.192 [¶]
Yes	150 (67.57)	24.88±6.31	
No	72 (32.43)	23.70±6.08	
Drinking alcohol (up to now), N (%)			0.931 [¶]
Yes	96 (43.24)	24.54±6.47	

No	126 (56.76)	24.47±6.10	
Addiction to smoked illegal drugs (up to now), N (%)			0.233 [¶]
Yes	138 (62.16)	24.89±6.27	
No	84 (37.84)	23.86±6.20	
Addiction to injected illegal drugs (up to now), N (%)			0.339 [¶]
Yes	119 (53.60)	24.87±6.37	
No	103 (46.40)	24.07±6.11	
To be prisoner (up to now), N (%)			0.170 [¶]
Yes	130 (58.56)	24.98±6.32	
No	92 (41.44)	23.81±6.12	
Edentulous Status, N (%)			0.002 [¶]
With edentulous	79 (35.59%)	26.21±6.37	
Without edentulous	143 (64.41%)	23.55±5.99	
Wearing partial or complete denture, N (%)			<0.001 [¶]
Yes	31 (13.96)	29.64±5.17	
No	191 (86.04)	23.66±6.02	

OHRQoL: Oral health related quality of life

SD: Standard Deviation

*Different letters show statistically significant differences

Table 3: Participants' quantitative characteristics and the relationship between the characteristics and their oral health related quality of life (N=222)

Participants' characteristics	Measures (Mean±SD)	Univariate Analysis	
		Pearson Correlation (r)	P value
Age	39.68±8.62	0.186	0.005
Duration of disease	7.61±4.21	0.177	0.008
Number of children	0.97±1.39	0.029	0.669

SD: Standard Deviation

Table 4: Multiple linear regression model with oral health related quality of life as dependent variable (N=222)

P value	F	Mean Square	Sum of Squares	Variables
0.162	1.97	66.98	66.98	Sex
0.434	0.84	28.54	57.07	Marriage status
0.637	0.45	15.36	30.72	Patient's education
0.063	2.80	95.39	190.77	Patient's job
0.721	0.44	15.11	45.34	Rout of HIV transmission
0.786	0.07	2.52	2.52	Smoking cigarette or hookah
0.816	0.05	1.84	1.84	Drinking alcohol
0.915	0.01	0.39	0.39	Addiction to smoked illegal drugs
0.375	0.79	26.84	26.84	Addiction to injected illegal drugs
0.810	0.06	1.96	1.96	Prisoner
0.056	3.69	125.50	125.50	Age
0.066	3.43	116.59	116.59	Duration of disease
0.985	0.01	0.01	0.01	Number of children
0.506	0.44	15.07	15.07	Edentulous Status
<0.001	13.64	463.85	463.85	Wearing partial or complete denture