



Oral health related quality of life and self-esteem in a general population

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Abstract

Background and aims. The interest in the research of both Oral Health Related Quality Of Life and dental aesthetics has increased in the recent years. The aim of the current study consists in the evaluation of the perception of oral-health, dental aesthetics and self-esteem in a general population.

Methods. A group of students of the Faculty of Dental Medicine, Cluj-Napoca, were trained in the field of questionnaire interviewing. The students were asked to apply the following questionnaires to a number of maximum five close persons: the OHIP-14Aesthetic questionnaire, the Rosenberg self-esteem scale and a questionnaire evaluating demographic data. Each interviewed subject provided informed consent. The sample included 97 subjects with an age range of 18-75 years. For each of the three applied questionnaires overall scores were computed and used for the calculation of Pearson correlations and inferential statistical procedures: the t-test.

Results. Related to the complete sample (N=97), the highest OHIP-14Aesthetic scores were obtained for the functional limitation (mean score of 2.22), physical pain (mean score of 2.72) and psychological discomfort (mean score of 1.37) subscales. The highest Rosenberg self-esteem scale scores were obtained for the following questions: "I think I am no good at all" (mean score of 3.50), "feel useless at times" (mean score of 3.53), "inclined to feel that I am a failure" (mean score 3.77), "positive attitude toward myself" (mean score of 3.50). Statistically significant correlations were registered between the overall Rosenberg self-esteem scale score and the scores of the following OHIP-14Aesthetic subscales: psychological discomfort ($r = -0.201$, $p = 0.49$), physical disability ($r = -0.219$, $p = 0.031$), psychological disability ($r = -0.218$, $p = 0.032$), social disability ($r = -0.203$, $p = 0.046$). The t-test revealed statistically significant gender differences, in regard to the OHIP-14Aesthetic overall score $t(95) = -2.820$, $p = 0.006$.

Conclusions. The current study indicates the existence of statistically significant gender differences in the perception of oral health and a series of dental aesthetics elements in a general population. Moreover, statistically significant correlations were obtained between the perception of oral health and the perception of self-esteem.

Keywords: dental aesthetics, oral health related quality of life, self-esteem, questionnaire, oral health

Introduction

Oral Health Related Quality of Life (OHRQoL) represents a multidimensional construct, composed of specific domains: survival, absence of disease or any type of impairment, absence of pain, proper physical, psychological and social functioning, self-content attitude towards the own oral health, absence of social handicap [1]. OHRQoL is used in order to assess the effect of oral conditions and the

effect of dental treatments on the patient's psychological state [2]. Dental and facial aesthetics represent major elements in the quality of life of patients in search for dental treatments [3]; consequently, dento-facial self-confidence has been considered an integrated part of OHRQoL [4], dental aesthetics and dento-facial attractiveness being linked with social behaviour [5-7]. Both OHRQoL and dental aesthetics are measured by questionnaires [8].

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The most used OHRQoL assessment questionnaire is represented by the Oral Health Impact Profile (OHIP) [2]. The questionnaire exists in its original, 49 item form [9], as well as in shorter, 14 questions, situational adapted forms: a version for temporo-mandibular disorder [10], a version for edentulous patients [11], as well as the OHIP-14 Aesthetic form for assessing the patients' dental aesthetics, as an integrated part of the OHRQoL [12]. OHIP-14 Aesthetic was developed out of the original OHIP, as an optimized instrument of evaluating dental aesthetics issues and consequences of the dental aesthetics status upon the patients' perception, together with other OHRQoL elements [12]. OHIP-14 Aesthetic evaluates aspects regarding the attitude of patients related to dental aesthetics as well as to other oral health problems. However, OHIP-14 Aesthetic has a limited usage in the literature so far and has been validated only for China [12].

Self-esteem can be defined as the amount of self-value and self-acceptance of an individual [13-15]. Self-esteem has been linked to specific conditions, such as perception of a poor state of health [16], limited economic expectations [17], social exclusion [18], depression [19] or to the general quality of life [17,20]. Self-esteem has also been strongly related to OHRQoL [21-23] and dental aesthetics [24]. One of the most popular self-esteem assessment questionnaires is represented by the Rosenberg Self Esteem Scale (RSES) and is used in various clinical contexts: depression [25], anxiety [26], general conditions [27] and oral conditions [28].

Dental aesthetics, has been assessed, together with OHRQoL and self-esteem in correlation with various variables, such as gender [29,30], age [31,32] or the cultural context [33].

The aim of the current study consists of the assessment of the gender differences regarding the self-perception of the dental aesthetics, OHRQoL, dentist-related behavior and self-esteem, using the Romanian translated versions of the OHIP-14 Aesthetic and RSES, in a general population sample. Moreover, the study intends to evaluate the interrelations between dental aesthetics, OHRQoL and self-esteem.

Methods

Instruments

The following self-reported measurements were used within the current study:

- the Romanian version of the OHIP-14 Aesthetic questionnaire; OHIP-14 Aesthetic is based on the same conceptual model as the original OHIP: Lockers conceptual model of oral health [34]. Accordingly to this model, the questions are divided in seven subscales, each investigating a specific topic: functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. Each subscale contains two questions. The extended

questions, belonging to each subscale, are presented in Appendix 1. Answers to the questions are ordered on a Likert scale, with answer options and encodings ranging from "Never" – 0 to "Very often" – 4. The questionnaire scores are calculated as subscale and overall scores, by summing the scores for each question comprised within a subscale the questionnaire was applied in accordance to Wong's indications [12]; OHIP-14 Aesthetic was applied in order to assess the self-perception of the dental aesthetics, as a component of the OHRQoL; the questionnaire's internal consistency has been tested on the current sample, with a Cronbach's Alpha of 0.88, value which is accordance with the one reported in the original OHIP-14 Aesthetic development study [12];

- the Romanian translation of the RSES. The RSES contains 10 questions investigating the respondent's self-esteem. The answers to the questions are organized on a Likert scale, ranging from "Strongly agree" – 1 to "Strongly disagree" – 4. The questions 2, 5, 6, 8, 9 receive inverted scoring, due to negative question formulation [35]. The RSES was applied according to the guidelines [35]; the questionnaire's internal consistency has been tested on the current sample, with a Cronbach's Alpha of 0.88, value which is corresponding with other literature reported values [36].

- an additional questionnaire evaluating:
 - socio-demographic variables: gender, age, living place, education, occupation, marital status;
 - eating habits; dental hygiene habits;
 - the subjects' interaction with the dentist; the frequency of the dental visits, within the last 5 years; the occurrence of the last dental visit; the main reason for presentation within the dental office; the quality of the communication with the dentist;

Each of these comprising questions presented multiple choice answers; the subjects had to choose one answer.

Design, participants and procedure

The current study was designed as a cross sectional survey. The current study was conducted with the ethics approval of the Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca. 28 dental students from the 2nd study year (enrolled in the Faculty of Dental Medicine, Iuliu Hatieganu University of Medicine and Pharmacy) were trained as interviewers for the current study. During the training process, the students became familiar with the structure of the three questionnaires, together with the form of consent; additionally they learned how to conduct a questionnaire interview, how to select the information needed to be specified to the patients and the way in which they should address possible questions from the side of the patients; moreover the students were informed they needed to observe the maximum interview duration of 20 minutes. Each student was asked to apply the 3 above-described questionnaires to 4 subjects (relatives, friends,

acquaintances). The students were involved in this study based on volunteer participation. The interview format was chosen, in order to minimize the rate of unanswered questions. Thus, the sample was chosen based on the convenience sample criteria, meeting the following inclusion criteria: both genders; an age interval of 18-75 years; urban or rural living environment; inferior study limit: middle school; unaltered communicational and cognitive abilities.

The final sample included 97 participants and presented the following characteristics: 40.2% M, 59.79% F and an age range of 19-72 years.

During a period two weeks, the students applied the questionnaires under the interview format. Each patient provided informed consent and had to choose only one answer option for each question.

Each response option received a numbered coding and the scores were calculated as following:

- in respect to the OHIP-14 Aesthetic questionnaire, the seven subscale scores were calculated, together with an OHIP-14 Aesthetic overall score; higher scores indicated a poorer OHRQoL;

- in respect to the RSES, an overall score was calculated; higher scores indicated a higher self-esteem;

- for the additional questionnaire, comprising demographic data, information regarding eating and dental habits, information regarding the communication with the dentist and dental visits, the answer frequency was calculated.

Data analysis

Following the data systematizing in a Microsoft Excel table, the scores for the three applied questionnaires were calculated, in accordance to the previous described guidelines.

Firstly, univariate descriptive statistical procedures were employed, with mean scores and standard deviation being calculated for the OHIP-14 Aesthetic subscales and overall questionnaire, as well as for the RSES. Secondly, Persons correlations were calculated, as following:

- between the OHIP-14 Aesthetic subscale/overall scores and the RSES overall scores;

- between the OHIP-14 Aesthetic subscale/overall scores and the dental hygiene/eating habits/interaction with de dentist questions scores.

Thirdly, inferential statistical procedures were applied, employing the t-test. The t-test evaluated:

- subscale/overall OHIP-14 Aesthetic scores differences between the male and female subjects; overall RSES scores differences between the male and female subjects;

- dental hygiene/eating habits/interaction with de dentist questions scores between the male and female subjects.

Results

Descriptive statistics

General data and answers to the questionnaire assessing demographic data, eating habits and oral hygiene habits are presented in table I.

Table I. Demographic data, eating habits, dental hygiene habits – overall sample (n=97).

	Mean(SD)
Age (17-72 years)	40.68
	Frequency (%)
Gender	
M	59.79
F	40.21
Living place	
Urban	85.56
Rural	14.43
Education	
High school	19.58
Postgraduate (Trade) school	14.43
College	54.63
Master Degree	10.3
PhD	1.03
Smoking in the past	
No	47.42
1-5y	21.64
5-10y	7.21
10-20y	8.24
over20y	15.46
Alcohol consumption	
Several times a week	6.18
Weekly	8.24
Several times a month	12.37
Monthly/on occasions	12.37
Very seldom	45.36
Never	15.46
Sweets consumption	
Daily	23.71
Several times a week	36.08
Weekly	13.4
Several times a month	13.4
Once in several months	8.24
Several times a year	5.15
Teeth brushing frequency	
Once in several days	2.06
Daily	32.98
Twice a day	60.82
Following each meal	4.12

The answers to the questions, evaluating the dentist and dental office related behavior, are presented in table II.

OHIP-14 Aesthetic subscale and overall scores means and standard deviations can be observed in table III.

RSES overall scores means and standard deviations can be observed in table IV.

Table II. Interaction with the dentist, experience with the dental office.

Last visit in the dental office					
1 month ago	3 months ago	6 months ago	1 year ago	2 years ago	Over 2 years ago
15.46	15.46	21.64	20.61	7.21	19.58
Dental visit frequency within the last 5 years					
Never	Once a year	Twice a year	Once in three months	Once in 4 months	Another Answer
-	2.06	32.98	60.82	4.12	-
Traumatic experience in the dental office					
Never	Yes, during childhood		Yes, during adulthood		
63.91	19.58		16.49		
Do you get along with your dentist					
Yes			No		
95.87			4.12		
Did you avoid the dental visit					
Yes			No		
27.83			72.16		

Table III. Univariate descriptive statistics – OHIP-14Aesthetic overall subscale scores.

	Functional Limitation	Physical Pain	Psychological Discomfort	Physical Disability	Psychological Disability	Social Disability	Handicap	Overall OHIP-14Aesthetic
Complete sample (n = 97); Mean (SD)	2.2 (1.92)	2.72 (1.37)	1.37 (1.88)	0.95 (1.29)	1.21 (1.26)	0.64 (1.19)	0.62 (1.3)	9.55 (7.73)
Male subjects (n = 39); Mean (SD)	1.74 (1.69)	2.1 (1.29)	0.82 (1.48)	0.51 (0.94)	0.84 (0.96)	0.56 (1.14)	0.35 (0.84)	6.94 (5.67)
Female subjects (n = 58); Mean (SD)	2.55 (2.01)	3.13 (1.27)	1.74 (2.03)	1.25 (1.40)	1.46 (1.39)	0.70 (1.22)	0.81 (1.52)	11.31 (8.45)

Table IV. Univariate descriptive statistics – RSES question and overall scores.

	1	2	3	4	5	6	7	8	9	10	
Complete sample (n = 97); Mean (SD)	3.34 (0.62)	3.5 (0.75)	3.47 (0.54)	3.47 (0.61)	3.42 (0.68)	3.53 (0.73)	3.4 (0.73)	2.34 (0.94)	3.77 (0.58)	3.5 (0.66)	33.77 (4.59)
Male subjects (n = 39); Mean (SD)	3.41 (0.67)	3.51 (0.75)	3.48 (0.50)	3.56 (0.64)	3.35 (0.74)	3.56 (0.75)	3.43 (0.71)	2.33 (1.03)	3.79 (0.52)	3.48 (0.64)	33.94 (4.2)
Female subjects (n = 58); Mean (SD)	3.29 (0.59)	3.50 (0.75)	3.46 (0.56)	3.41 (0.59)	3.46 (0.65)	3.51 (0.73)	3.37 (0.74)	2.34 (0.88)	3.75 (0.62)	3.51 (0.68)	33.65 (4.84)

Pearson correlations

The following statistical significant correlations between the subscale/overall OHIP-14 Aesthetic scores and the questions/overall RSES scores were obtained:

- the psychological discomfort subscale scores with the “On the whole, I am satisfied with myself” (r = -0.258, p = 0.011), “I feel I do not have much to be proud of” (r = -0.330, p = 0.001) questions scores and the RSES overall scores (r = -0.201, p = 0.49);

- the physical disability subscale scores with the “On the whole, I am satisfied with myself” (r = -0.330, p = 0.001), “I feel I do not have much to be proud of” (r = -0.238, p

- = 0.019), “I wish I could have more respect for myself” (r = -0.219, p = 0.031) questions scores and the RSES overall scores (r = -0.219, p = 0.031);

- the psychological disability subscale scores with the “On the whole, I am satisfied with myself” (r = -0.277, p = 0.006), “I feel I do not have much to be proud of” (r = -0.260, p = 0.01), “I wish I could have more respect for myself” (r = -0.245, p = 0.016) questions scores and the RSES overall scores (r = -0.218, p = 0.032);

- the social disability subscale scores with the “I feel I do not have much to be proud of” (r = -0.312, p = 0.002) question scores and the RSES overall scores (r = -0.203, p = 0.046);

- the handicap subscale scores with the “I feel that I have a number of good qualities” ($r = -0.204$, $p = 0.045$), “I feel I do not have much to be proud of” ($r = -0.297$, $p = 0.003$), “I feel that I’m a person of worth, at least on an equal plane with others.” ($r = -0.267$, $p = 0.008$), “I wish I could have more respect for myself” ($r = -0.234$, $p = 0.021$) questions scores and the RSES overall scores ($r = -0.237$, $p = 0.019$);

- the overall OHIP-14 Aesthetic scores with the “I certainly feel useless at times” ($r = 0.219$, $p = 0.031$) and the “I take a positive attitude toward myself” ($r = 0.217$, $p = 0.033$) question scores.

The following statistical significant correlations between the subscale/overall OHIP-14 Aesthetic scores and the dental hygiene/eating habits/dentist interaction questions scores were obtained:

- the functional limitation subscale with the “Last visit in the dental office” ($r = -0.262$, $p = 0.010$), “Did you avoid the dental visit” ($r = -0.310$, $p = 0.002$), “Traumatic experience in the dental office” ($r = 0.278$, $p = 0.006$), “Do you get along with your dentist” ($r = -0.246$, $p = 0.015$) questions;

- the pain subscale with the “Alcohol consumption” ($r = -0.207$, $p = 0.042$) assessment question;

- the psychological discomfort subscale with the “Dental visit frequency within the last 5 years” ($r = 0.288$, $p = 0.004$) question;

- the physical disability subscale with the “Did you avoid the dental visit” ($r = -0.217$, $p = 0.033$) question;

- the psychological disability subscale with the “Dental visit frequency within the last 5 years” ($r = 0.242$, $p = 0.017$), “Did you avoid the dental visit” ($r = -0.276$, $p = 0.006$), “Traumatic experience in the dental office” ($r = 0.225$, $p = 0.027$), “Alcohol consumption” ($r = -0.248$, $p = 0.014$) questions;

- the social disability subscale with the “Dental visit frequency within the last 5 years” ($r = 0.329$, $p = 0.001$) question;

- the handicap subscale with occupation ($r = -0.280$, $p = 0.005$) and with the “Dental visit frequency within the last 5 years” ($r = 0.226$, $p = 0.026$), “Last visit in the dental office” ($r = 0.22$, $p = 0.029$) questions;

- the overall OHIP-14 Aesthetic score with the “Alcohol consumption” ($r = -0.226$, $p = 0.026$) assessment question.

Inferential statistics – the t-test

The t-test indicated statistically significant differences between male and female subjects, for the following OHIP-14 Aesthetic subscale scores: functional limitation subscale score $t(95) = -2.057$, $p = 0.042$, pain subscale score $t(95) = -3.896$, $p = 0.001$, psychological discomfort subscale score $t(95) = -2.420$, $p = 0.017$, physical disability subscale score $t(95) = -2.897$, $p = 0.005$, psychological disability subscale score $t(95) = -2.417$, $p = 0.018$. Differences were obtained also for the OHIP-14

Aesthetic overall score $t(95) = -2.820$, $p = 0.006$.

The t-test did not indicate any statistically significant differences between male and female subjects, in respect to the RSES question scores and overall scores.

The t-test indicated statistically significant differences between male and female subjects, also for the “Dental floss usage” $t(95) = -2.373$, $p = 0.020$, “Smoking frequency in the past” $t(95) = 2.585$, $p = 0.011$, “Alcohol consumption” $t(95) = 6.487$, $p = 0.001$.

Discussion

The main purpose of the current study implied the assessment of the gender variations in dental aesthetics, OHRQoL and self-esteem, together with their interrelations.

Regarding the self-perception of the dental aesthetics and OHRQoL, the usage of the OHIP-14 Aesthetic led to the following observations: The OHIP-14 Aesthetic subscales, which registered the highest scores, for the complete sample, were functional limitation, pain and psychological discomfort. For the male subjects, the highest scored subscales were functional limitation, pain and psychological disability. For the female subjects, the highest subscale scores belonged to the functional limitation, pain and psychological discomfort subscales (mean subscale scores can be assessed in table I). The higher scores indicate more severe effects upon the OHRQoL. However, the resulted scores are smaller compared to other reported results, using the same instrument [37].

Related to the perception of the self-esteem, the usage of the RSES suggested the following observations: For the complete samples, the RSES questions which scored highest were “At times I think I am no good at all”, “I certainly feel useless at times” and “All in all, I am inclined to feel that I am a failure”. Regarding the male subjects, the highest question scores were registered for “At times I think I am no good at all”, “I certainly feel useless at times” and “I am able to do things as well as most other people”. Concerning the female subjects, the questions presenting the highest scores were “At times I think I am no good at all”, “I feel that I have a number of good qualities”, “I feel I do not have much to be proud of”, “All in all, I am inclined to feel that I am a failure” and “I take a positive attitude toward myself” (mean question scores can be assessed in table II). The higher RSES scores indicated the perception of a higher self-esteem. The obtained overall scores are higher, compared to other literature reports [23], and approach the maximum threshold score of 40, indicated that the subjects perceived a good self-esteem.

The differences in the perception of both dental aesthetics and OHRQoL, in relation to gender, were assessed by comparing the subscale and overall OHIP-14 Aesthetic male and female subjects’ scores. The t-test indicated statistically significant differences between the

scores of the male and female subjects, for five of the OHIP-14Aesthetic subscale scores, as well as for its overall scores. These differences can be extensively assessed within the results section. Accordingly to the OHIP-14Aesthetic scores, within the present study, the female subjects presented the self-perception of worsened dental aesthetics and OHRQoL.

The studies which use the OHIP-14Aesthetic questionnaire are limited in literature, no gender differences regarding the self-perception of dental aesthetics, using this questionnaire, have been reported so far. However, statistically significant differences in the perception of the OHRQoL have been reported using the original long OHIP-49 form, which OHIP-14Aesthetic was derived from. In one study, female subjects reported the perception of a more altered OHRQoL, compared to male subjects [38]. Similar with the current study, in respect to the dental aesthetics, a more critical approach for the female subjects was reported, but with the usage of another self-reporting instrument [39]. In other studies, female subjects tended to be more critical in the evaluation of the smile and dental aspects [39], dental color [40] or when answering combined dental aesthetics and OHRQoL questionnaires [41]. In contrast to the present study, other research protocols indicate no gender-related statistically significant OHRQoL perception differences, using different forms of the OHIP questionnaire [42].

The differences in the perception of the self-esteem in relation to gender were investigated by comparing the overall RSES male and female scores. The t-test did not highlight any overall scores differences in respect to subject gender. This finding is in consistency with other study results, which report no self-esteem differences related to gender, both in dental patients [23] and general patients [18].

The interrelation between dental aesthetics/OHRQoL and self-esteem has been investigated through the Pearson correlations, calculated between the subscale/overall OHIP-14Aesthetic scores and the RSES question and overall scores. Five of the OHIP-14Aesthetic subscale scores were statistically significant correlated with RSES question scores and RSES overall scores. Moreover, the overall OHIP-14Aesthetic score was statistically significant correlated with RSES question scores. All the obtained correlations were negative, meaning that low OHIP-14Aesthetics scores were correlated with high RSES scores. Thus, the perception of satisfactory dental aesthetics and OHRQoL was correlated with a high self-esteem. The complete set of correlations was extensively presented in the results section.

Interrelations between dental aesthetics, OHRQoL and self-esteem have been statistically significant suggested in similar studies, as well, both in regard to dental aesthetics-self-esteem [21,29] and in regard to OHRQoL-self-esteem, using either OHIP forms [22,28] or other instruments [21,23].

The interrelation between the OHRQoL and eating/habits, dental hygiene habits, the interaction with the dentist has been evaluated through the Pearson correlations, calculated between the subscale/overall OHIP-14Aesthetic scores and the scores of the questions assessing the above mentioned elements. All of the subscales, together with the overall OHIP-14Aesthetic score correlated statistically significant with the scores belonging to questions such as: "Last visit in the dental office", "Traumatic experience in the dental office", "Do you get along with your dentist", "Did you avoid the dental visit" or "Traumatic experience in the dental office". Alcohol consumption was as well related to the OHIP-14Aesthetic subscale and overall scores. The complete set of correlations was extensively presented in the results section.

The perception of a good OHRQoL, which correlated with a high self-esteem, can be partially explained by the samples current characteristics: the majority of the sample live in an urban environment, implying higher access to health care services (indicated? by the sample's overall high dental visit frequency); the majority of the sample has college educational degree; the highest percent of the sample reported no smoking and reduced alcohol consumption; the majority of the sample reported a high teeth brushing frequency.

The current results can also be explained by the following limits of the present study: the usage of a convenience, small sized sample, together with the interviewers' reduced degree of experience in such studies, as the interviewers were represented by second year students. Further research on larger and more diversified samples as well systematic teaching in the questionnaire appliance are needed.

Conclusions

Within its limitations, the current study indicates that the self-perception of the dental aesthetics and OHRQoL interrelate with one person's self-esteem. However, the strength of this relations has been found to be reduced. Additionally, self-perception was proved to vary by gender, in the assessment of the dental aesthetics and OHRQoL.

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