

Do aesthetics dental needs interfere in the oral health-related quality of life and in the self-esteem of patients seeking for treatment at University São Francisco Dental School?

Karina Ferreira Rizzardi^{1,2}, Leonardo Caldas Vieira³,
Thais Manzano Parisotto^{2,4}, Cristiane Franco Pinto⁵

¹ Master Degree Student, Universidade São Francisco. Rua Santa Cruz, 683, Santa Libania, Bragança Paulista, São Paulo, Brasil. Tel. +55 (11) 9-5228-0358. karina_f_r@hotmail.com

² Laboratory of Microbiology and Molecular Biology, Universidade São Francisco, Av. São Francisco de Assis 218, Bragança Paulista, São Paulo, Brasil.

³ Odontology, Hospital das Clínicas Samuel Libanio, R. Comendador José García, 777 - Centro, Pouso Alegre, Minas Gerais, Brasil.

⁴ Department of Pediatric Dentistry, Universidade São Francisco, Av. São Francisco de Assis 218, Bragança Paulista, São Paulo, Brasil.

⁵ Department of Dentistry, Universidade São Francisco, Av. São Francisco de Assis 218, Bragança Paulista, São Paulo, Brasil.

Corresponding author:

Cirurgiã-dentista: Karina Ferreira Rizzardi. Rua Santa Cruz, 683, Santa Libania, Bragança Paulista-SP. Tel +55 (11) 9-5228-0358. karina_f_r@hotmail.com

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Aim: The objective was to evaluate oral health-related quality of life (OHRQOL) in patients aging 18 - 60 years, considering oral health, dental aesthetic impact and self-esteem. **Methods:** The sample comprised 81 patients, regardless gender/ethnicity, seeking for dental aesthetic treatment at University São Francisco, Bragança Paulista-SP. The instruments used to assess the OHRQOL were the questionnaires: 1. Rosenberg Self-Esteem Scale (RSS); 2. Oral Health Impact Profile-14 Brazil (OHIP) and 3. Psychosocial Impact and Aesthetic Dental Questionnaire-Brazil (PIADQ). Data were analyzed by Spearman correlation ($\alpha=5\%$) and descriptive statistics. **Results:** The older the patient the worse the oral and general health conditions found ($p<0.05$). Moreover, the age showed significant correlation with OHIP and PIADQ questionnaires scores ($p=0.000$). The three questionnaires showed moderate positive correlations ($p<0.05$ $r=0.461-0.685$) among them. In addition, OHIP and QIPED questionnaires correlated with general health and oral health ($p<0.05$ $r=0.230-0.558$). **Conclusion:** It could be concluded that aesthetic dental needs interfere, in fact, in the oral health-related quality of life and in the self-esteem of patients seeking for treatment University São Francisco Dental School.

Keywords: Quality of life. Esthetics Dental. Oral health.



Introduction

Quality of life refers to the individual's perception of their everyday position, their goals, expectations, concerns, experiences and culture to which the individual belongs^{1,2}. Quality of life research in the health area contributes to the evaluation of the cost/benefit ratio of a service, which contributes to the improvement of the treatment offered^{2,3}.

According to the study of Castro et al.⁴, health is not restricted to the absence of diseases/injuries, but also to the repercussion of the health problems in the daily activities. In the same way as general health, oral health is essential for quality of life, and pain and discomfort are closely related to the difficulty of eating, socializing and working, for example⁵. Thus, the objective of medical/dental care for most patients is to achieve a better quality of life with good functional capacity and well-being⁶.

The importance of the patient's opinion about the results of the interventions, and not only the professional opinion, is of great importance. This way, it is crucial that researchers could be able to measure the individual's health perception in order to evaluate the benefit of their interventions in the patient's life⁷. Successful measurement within oral health is essential toward more patient-centered oral health care⁸.

Oral health is influenced by many factors generating positive and negative emotions⁹ that change over time. The oral health operation, include daily life activities such as eating, talking and smiling¹⁰. Oral health-related quality of life (OHRQoL) can be associated with psychological variables, social interactions and general well-being¹¹. It was already shown that low OHRQoL conditions in adults living in England could be associated with depressive symptoms¹². Furthermore, people may be judged by their teeth: adults with ideal smiles were considered more intelligent, whereas those with poor dental esthetics were associated with lower intelligence. Additionally, subjects with good oral health have greater chances of finding a job, than of those with unpleasant smiles¹³.

In this context, the application of instruments to quantify physical, emotional and social well-being, which are closely related to oral health-related quality of life, has been recognized as an important outcome measure⁶.

Thus, the objective of the present study was to evaluate the oral health-related quality of life of individuals aged 18 to 60 years, who sought for aesthetic treatment in the dentist sector of the University of São Francisco - USF, considering self-esteem, oral health and the impact of aesthetic dentistry.

Material and methods

A convenience sample comprised 100 individuals, aged 18-60, of all genders and ethnicities, with aesthetic needs, who attended the Integrated Clinic of Dentistry of the University of São Francisco-USF. Patients with dental aesthetic needs, especially in the upper incisors, were included in this study. On the other hand, unlettered patients were excluded, because they could not be able to read and answer the questionnaires. The period of data collection was August 2016 – December 2016 in Bragança Paulista.

The city of Bragança Paulista is located at 88 kilometers from the capital (São Paulo) and has a population of approximately 159,000 inhabitants (IBGE - 2014), most living in the urban area. The city shows a relatively high human development index (HDI = 0.776), and offers the following oral health programs: Primary Dental Care and Dental Specialty Center (CEO/University of São Francisco-USF).

The aesthetic needs included: direct facets, restorations and temporary crowns involving anterior teeth, as well as dental whitening. The identification of the aesthetic needs was performed by the students enrolled in the Integrated Dental Clinic of USF. Theoretical instructions about aesthetic needs were given by the professors of the Dental Clinic to the students and clinical photographs were also used in the calibration process.

The patients were invited to fill three questionnaires in the waiting room of the Dental Clinic. The questionnaires were related to self-esteem¹⁴, oral health-related quality of life¹⁵ and the influence of dental aesthetics on the quality of life¹⁶ of the individuals in the waiting room of the Dental Clinic”.

The instruments used in the present research were:

1. Rosenberg Self-esteem Scale (RSS) - UNIFESP/EPM¹⁴, a specific questionnaire for the evaluation of self-esteem, feelings, personal care and appreciation, comprising 10 questions, scored from 0 to 3. Thus, the final score of this questionnaire ranged from 0 to 30, and the closer to 0, the better the self-esteem.
2. Oral Health Impact Profile (OHIP) - 14 Brazil¹⁵. A generic questionnaire about the oral health-related quality of life with 14 questions assessing problems with teeth, mouth or dental prosthesis. Responses were scored from 0 to 4 and the final score of all questions resulted in scores between 0 and 56, where the higher the score, the greater the individual perception and the worse the quality of life.
3. Psychosocial Impact and Aesthetics Dental Questionnaire (PIADQ) - Brazil/UNIFESP¹⁶. A specific questionnaire to evaluate the influence of dental aesthetics on the quality of life of the individuals, with 23 items containing four dimensions: dental self-confidence, social impact, psychological impact and aesthetic impact. The items were scored from 0 - 4, ranging from 0 to 92, and lower values indicated a better quality of life.

All instruments were self-applied and involved closed questions. Together with the three questionnaires, the oral health conditions were also assessed by closed questions answered by the patients themselves. Still, patients were asked to complete a form about the following data: age, gender, family income, general and oral health. In this form about 10 questions were asked, such as: “Do you have systemic disease?”, “Are you in medical treatment?”, “Do you take medicine for chronic disease?” “Have you ever had a tooth/teeth extracted by dentist(s)?”, “Do you wear dental prosthesis?” “Have you ever used orthodontic appliance?”, “Have you ever had a cosmetic treatment in your teeth?”. The answers were: Yes or No.”

The project was approved by the Ethics Committee in Research of the University São Francisco (CAAE: 58766516.6.0000.5514) and only the individuals who agreed and signed the Informed Consent form took part in the research.

The data were analyzed by Spearman correlation, using Statistical Package for Social Science – SPSS 16.0 (USA), considering a 5% level of significance. Secondary data were analyzed by descriptive statistics.

Results

From a total of 100 patients selected for the study, 19 individuals did not fill a certain question of the evaluation instruments and, therefore, were excluded from the study. This way, the final sample consisted of 81 individuals, the minimum age was 18 years and the maximum age was 60 years.

Table 1 shows the mean age of the participants in the study, which was 35,25 years. Similar values were found when men's age was compared to women's age. The mean and standard error of the scores of the questionnaires were also displayed in this table. The worse the oral health conditions, the higher the impact of the dental clinical condition, resulting in higher questionnaires scores.

Table 1. Sample characterization regarding age, income and questionnaires' scores.

Characteristics	Mean	Standard error
Women`s Age (years)	34.12	±1.40
Men` Age (years)	27.57	±1.35
Women`s and men`s Age (years)	35.25	±1.54
Rosenberg Self-Esteem Scale (RSS) Scores	7.10	±0.54
Oral Health Impact Profile-14 Brazil (OHIP) Scores	11.00	±1.05
Psychosocial Impact and Aesthetic Dental Questionnaire-Brazil (PIADQ) Scores	29.30	±2.12

The higher the questionnaires `scores, the higher the impact of the dental clinical condition

Figure 1 shows that the majority of the sample was comprised by female. Information about general and oral health of the individuals enrolled in the present research indicated that the general conditions were good, whereas oral conditions were regular or poor. These data were obtained through a questionnaire including only closed questions.

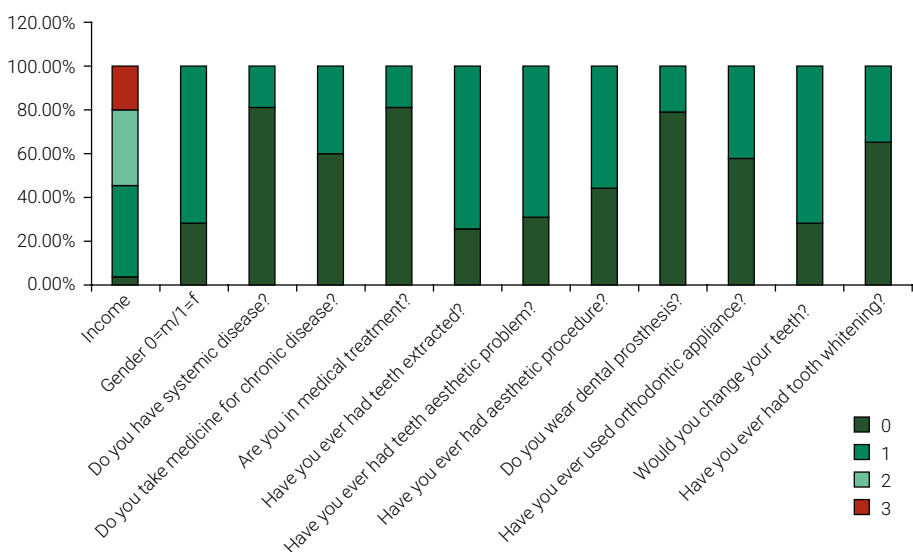


Figure 1. Sample characterization considering income, gender, general health and dental health conditions obtained by questionnaires.

Table 2 shows the correlations between the three oral health-related quality of life questionnaires (RSS, OHIP and PIADQ), age, gender, income, and general/oral health conditions in the patients studied. The higher the patient's age, the higher were the OHIP and PIADQ scores, indicating that the oral health-related quality of life and the dental aesthetics worsened with age ($p=0.000$). Positive correlations ($p<0.05$, $r=0.299 - 0.468$) were also observed between the patient's age and the variables: general health (systemic disease and medical treatment) and oral health (extracted tooth, aesthetic problem in the tooth, dental prosthesis, appearance of the teeth). Negative correlations ($p=0.000$, $r=-0.399 - -0.468$) were observed between age and income, as well as the use of orthodontic appliances.

The three quality of life questionnaires: RSS, OHIP and PIADQ presented:

1. Moderate positive correlations ($p=0.000$, $r=0.331 - 0.685$) with each other and with the individual wishing to change the appearance of the teeth;
2. Negative correlations ($p<0.05$, $r=-0.237 - -0.447$) with income and the following oral health conditions: orthodontic appliance usage and performance of aesthetic procedures in teeth, indicating that the worse the oral health-related quality of life the less the access to aesthetic treatments.

The OHIP and PIADQ questionnaires showed correlations with the following variables: systemic disease, aesthetic problems in the teeth and prosthesis usage ($p<0.05$, $r=0.292 - 0.345$).

Considering the oral health conditions, the presence of extracted teeth correlated with the EAR and PIADQ questionnaires, with already having an aesthetic problem on the teeth, dental prosthesis usage, income and orthodontic appliance usage ($p<0.05$, $r=-0.239 - 0.255$).

The use of dental prosthesis showed positive correlations with general health, desire to change the appearance of the teeth and aesthetic dental problem ($p<0.05$, $r=0.257 - 0.458$); and negative correlations with income, use of orthodontic appliance and teeth bleaching ($p<0.05$, $r=-0.247 - -0.381$). The desire to change the teeth appearance showed significant positive correlations with medical treatment and aesthetic problems in the teeth ($p<0.05$, $r=0.230 - 0.291$); and significant negative correlations with the income and use of orthodontic appliance ($p<0.05$, $r=-0.344 - -0.352$). The question "Have you ever had an aesthetic procedure in the teeth?" had positive correlations with the use of appliance and bleaching ($p=0.000$, $r=0.408 - 0.441$). The use of orthodontic appliance had positive correlations with income and bleaching ($p<0.05$, $r=0.252 - 0.381$), and negative correlations with systemic diseases and medical treatment ($p<0.05$, $r=-0.277 - -0.341$).

Discussion

In the present study, it was pointed out that the older the patient who require aesthetic dental procedures, the worse the oral health-related quality of life.

The higher the patient's age, the worse the scores obtained in the specific questionnaires related to oral health (OHIP) and dental aesthetics (PIADQ), showing that patients with higher age probably had less access to the dentist and to preventive measures at

Table 2. Correlation between the three questionnaires of self-esteem, oral health-related quality of life and the influence of dental aesthetics on the quality of life, income, general and oral health conditions in the study population.

	Questionnaires				General health				Oral health			
	Income	RSS	OHIP	PIADQ	Systemic Disease	Medical Treatment	Extracted teeth	Aesthetic dental problem	Prosthesis usage	Orthodontic appliance usage	Desire to change teeth appearance	Dental whitening
Gender	R=-0,015 P=0,893	R=+0,009 P=0,939	R=+0,022 P=0,844	R=+0,035 P=0,754	R=-0,042 P=0,706	R=+0,096 P=0,389	R=-0,009 P=0,936	R=-0,018 P=0,869	R=+0,065 P=0,565	R=+0,147 P=0,190	R=+0,028 P=0,801	R=-0,060 P=0,592
Age	R=-0,399 P=0,000*	R=+0,205 P=0,065	R=+0,501 P=0,000*	R=+0,530 P=0,000*	R=+0,447 P=0,000*	R=+0,459 P=0,000*	R=+0,415 P=0,000*	R=+0,299 P=0,006*	R=+0,448 P=0,000*	R=+0,468 P=0,000*	R=+0,377 P=0,001*	R=+0,132 P=0,239
RSS	R=-0,237 P=0,032*	-	R=+0,461 P=0,000*	R=+0,467 P=0,000*	R=+0,166 P=0,135	R=+0,085 P=0,448	R=+0,255 P=0,021*	R=+0,090 P=0,419	R=+0,143 P=0,199	R=+0,265 P=0,017*	R=+0,331 P=0,003*	R=-0,315 P=0,004*
OHIP	R=-0,321 P=0,003*	R=+0,461 P=0,000*	-	R=+0,685 P=0,000*	R=+0,301 P=0,006*	R=+0,173 P=0,120	R=+0,201 P=0,071	R=+0,297 P=0,007*	R=+0,299 P=0,006*	R=+0,402 P=0,000*	R=+0,427 P=0,000*	R=-0,358 P=0,001*
PIADQ	R=0,330 P=0,002*	R=+0,467 P=0,000*	R=+0,685 P=0,000*	-	R=+0,297 P=0,007*	R=+0,211 P=0,057	R=+0,230 P=0,037*	R=+0,292 P=0,008*	R=+0,345 P=0,001*	R=+0,447 P=0,000*	R=+0,558 P=0,000*	R=-0,399 P=0,000*
Systemic disease	R=-0,385 P=0,000	R=+0,166 P=0,135	R=+0,301 P=0,006*	R=+0,297 P=0,007*	-	R=+0,674 P=0,000*	R=+0,205 P=0,064	R=+0,245 P=0,027*	R=+0,458 P=0,000*	R=+0,341 P=0,002*	R=+0,159 P=0,156	R=-0,146 P=0,193
Chronic use of medication	R=-0,114 P=0,306	R=0,069 P=0,539	R=0,050 P=0,657	R=-0,119 P=0,285	R=+0,397 P=0,000*	R=+0,591 P=0,000*	R=+0,126 P=0,260	R=+0,041 P=0,714	R=+0,146 P=0,191	R=+0,131 P=0,242	R=0,051 P=0,650	R=+0,156 P=0,164
Medical Treatment	R=-0,411 P=0,000*	R=+0,085 P=0,448	R=+0,173 P=0,120	R=+0,211 P=0,057	R=+0,674 P=0,000*	-	R=+0,205 P=0,064	R=+0,313 P=0,004*	R=+0,458 P=0,000*	R=+0,277 P=0,012*	R=+0,230 P=0,039*	R=-0,012 P=0,913
Aesthetic procedure on teeth	R=-0,004 P=0,972	R=-0,344 P=0,002*	R=0,255 P=0,021*	R=-0,275 P=0,012*	R=+0,101 P=0,368	R=+0,313 P=0,004*	R=0,012 P=0,912	R=+0,161 P=0,147	R=+0,089 P=0,428	R=+0,408 P=0,000*	R=0,067 P=0,550	R=+0,441 P=0,000*
Extracted teeth	R=-0,238 P=0,031*	R=+0,255 P=0,021*	R=+0,201 P=0,071	R=+0,230 P=0,037*	R=+0,205 P=0,064	R=+0,205 P=0,064	-	R=+0,218 P=0,049*	R=+0,231 P=0,037*	R=+0,239 P=0,032*	R=+0,127 P=0,258	R=+0,015 P=0,892
Aesthetic dental problem	R=0,179 P=0,108	R=0,090 P=0,419	R=+0,297 P=0,007*	R=+0,292 P=0,008*	R=+0,245 P=0,027*	R=+0,313 P=0,004*	R=+0,218 P=0,049*	-	R=+0,273 P=0,013*	R=+0,027 P=0,808	R=+0,291 P=0,009*	R=-0,020 P=0,859
Prosthesis usage	R=-0,381 P=0,000*	R=+0,143 P=0,199	R=+0,299 P=0,006*	R=+0,345 P=0,001*	R=+0,458 P=0,000*	R=+0,458 P=0,000*	R=+0,231 P=0,037*	R=+0,273 P=0,013*	-	R=0,254 P=0,022*	R=+0,257 P=0,020*	R=0,247 P=0,026*
Orthodontic appliance usage	R=+0,252 P=0,023*	R=0,265 P=0,017*	R=0,402 P=0,000*	R=0,447 P=0,000*	R=0,341 P=0,002*	R=0,277 P=0,012*	R=0,239 P=0,032*	R=0,027 P=0,808	R=0,254 P=0,022*	R=0,027 P=0,808	R=0,352 P=0,001*	R=+0,381 P=0,000*
Desire to change teeth appearance	R=-0,344 P=0,002*	R=+0,331 P=0,003*	R=+0,427 P=0,000*	R=+0,558 P=0,000*	R=+0,159 P=0,156	R=+0,230 P=0,039*	R=+0,127 P=0,258	R=+0,291 P=0,009*	R=+0,257 P=0,020*	R=0,352 P=0,001*	-	R=-0,060 P=0,592

RSS = Rosenberg Self-Esteem Scale

OHIP = Oral Health Impact Profile

PIADQ = Psychosocial Impact and Aesthetic Dental Questionnaire-Brazil

The asterisk "*" indicates statistical significance (α = 5%) and hatching areas show this same statistical significance without considering repeated data.

population level. In line with these findings, the study of Colussi and Freitas¹⁷ confirms that the oral health conditions of the old people are extremely precarious in Brazil. Regarding the aging process, there is a great probability of failure in the biological systems of the human organism and older people in the present study showed more systemic diseases, more medical treatments and more dental problems (extracted teeth/dental prosthesis usage), corroborating the study of Sáez-Prado et al.¹⁸. Moreover, with aging, teeth might become yellowish with the decrease in enamel thickness, root tissue could be exposed, and greater susceptibility to the repetitive restorative cycle become evident.

It should be emphasized that the poor oral health can lead to serious complications, since dental and gingival infections until coronary problems^{19,20}, and the oral health is an inseparable part of the general health of our organism^{18,21}. It was also found that the older the person the lower the income, which may be related to retirement. This way, older people can have less financial conditions for having their teeth treated by a dentist, especially due to the high value of the prosthetic procedures, which are their main need.

The three questionnaires (RSS, OHIP and PIADQ) showed positive correlations among themselves. Moreover, all of them were effective in showing the impact of oral health conditions on the quality of life, reinforcing that a bad oral health and a low self-esteem are in fact associated with quality of life. A negative correlation was obtained among the scores of the three questionnaires and income, dental aesthetic procedure, orthodontic appliance and whitening, which may suggest that bad financial conditions could lead to difficulties in the access to aesthetic procedures. Thus, most of the time, procedures of high cost and complexity could only be obtained in the Dental Schools, highlighting the importance of a straight relationship between university and community. This is in line with the study of Maciel and Kornis²².

Specific oral health (OHIP) and dental aesthetic questionnaires (PIADQ) revealed higher and consequently worse scores, which correlated positively with systemic disease, dental aesthetic problems, wear of dental prosthesis and desire to change the appearance of the tooth. There is already scientific evidence associating oral diseases with systemic diseases, for example, the individuals with diabetes mellitus are prone to develop periodontitis with aggressive progression²³, closely related to teeth loss. The loss of the teeth influences not only aesthetics, but also the quality of life and the food trituration²⁴, which is the first step in the digestive process, prejudicing the absorption of nutrients, which are essential for a good health.

The more the teeth were lost, the higher the scores of the self-esteem (RSS) and dental aesthetic questionnaire (PIADQ), indicating a worse quality of life. In addition, patients with more extracted teeth by dentist also had lower income and a frequency of orthodontic appliance usage. Thus, it is observed that this kind of patient, ends up looking for the public service, because they cannot afford a particular treatment. According to the study of Vargas and Paixão²⁵ in the public service only basic care attention is offered and therefore, extraction is the only procedure that can be performed when the dental situation is critical. This is a very invasive procedure performed in cases of: extensive caries, periodontal disease, iatrogeny involving dental prosthesis of poor quality²⁶. The loss of the dental element causes great personal and social damages, for example: difficulties in employment, communication and shaming, which significantly reduces the self-esteem.

Although the dental prosthesis minimizes this loss, just a few cities in Brazil are able to offer this treatment in the public service, limiting the reestablishment of aesthetics and function²⁵ to individuals with greater economic conditions. The IBGE 2015 survey shows that 11% of Brazilians do not have teeth at all in the mouth, which corresponds to 16 million people, and about 33.3% of the population uses dental prosthesis.

It was observed in the present research that even using dental prosthesis, the self-esteem has still been poor in certain patients, because although the prosthesis minimizes the loss, it never replaces identically the dental element. Our results also indicate that individuals with dental prosthetic needs have more often systemic diseases, medical treatments, aesthetic problems in teeth, would like to change their teeth appearance, have low purchasing power, hadn't used orthodontic device and have never whitened the teeth. Thus, it is clear that the factors are closely linked, that is, one condition leads to another, culminating in worse conditions of oral health-related quality of life in the population.

It is worth remembering that older patients lived in a time when dentistry was focused on curative treatments. Nowadays, dentistry is focused on prevention and health promotion, as well as minimally invasive treatments²⁷, aiming at maintaining the dental element as long as possible in the oral cavity, favoring self-esteem and consequently a better the oral health-related quality of life.

The use of orthodontic appliance showed positive correlations with a higher income, bleaching performance, and less needs for medical treatments and systemic diseases. The fact that they have a better financial condition is usually linked to a better social condition, so they could afford preventive treatments, as observed in Baldani's et al. research²⁸, that identified the regular visit to the dentist as a strong factor of protection against oral diseases.

In Brazil the social difference in the population is high, there is a big difference between the percentage of the rich and the poor people, and the access to public treatment is time-consuming because of the demand. The big point is that the curative treatment is much more expensive than the preventive ones, leading to more costs to the government. Nowadays, the higher cost is a significant factor in our country, therefore, effective preventive programs should be stimulated, beginning with childhood²⁹.

In the present study, the patients who sought for a treatment at USF Dental Clinic had a large difference in the family income, indicating that patients who make more money as well as those who make less money looked for dental care in the university. This finding suggests that treatment within the Universities have teacher's supervision and therefore, have usually good quality, being even better than those performed in private clinics, especially when considered the popular ones. Moreover, all the patients in this study present aesthetic problems, wishing to reestablish the harmony of a smile and also good masticatory and phonetic conditions, and a multidisciplinary treatment could be often found at Universities³⁰. In addition, these procedures have high costs in private practices, and in the University most of the aesthetic treatments are for free.

The limitation of this research includes the size of the sample, as many patients were excluded because of unanswered questions in the questionnaires, narrowing the extrapolation of our results to the entire population.

The data analysis of the present research suggests that aesthetic dental needs actually interfere with patients' quality of life, and that the needs become worse with aging and with low family income.

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References

1. Ciconelli RM, Ferraz MB, Santos W, Meinão I, Quaresma MR. [Brazilian-Portuguese version of the SF-36. A reliable and valid quality of life outcome measure]. *Rev Bras Reumatol*. 1999 May-Jun;39(3):143-50. Portuguese.
2. Dantas RAS, Sawada NO, Malerbo NB. [Research on quality of life: review on the scientific production of public universities in São Paulo State]. *Rev Latino Am Enfermagem*. 2003; 11(4):532-8. doi: 10.1590/S0104-11692003000400017. Portuguese.
3. Alderman AK, Wilkins EG, Lowery JC, Kim M, Davis JA. Determinants of patient satisfaction in postmastectomy breast reconstruction. *Plast Reconstr Surg*. 2000 Sep;106(4):769-76.
4. Castro RA, Portela MC, Leão AT. [Cross-cultural adaptation of quality of life indices for oral health]. *Cad Saude Publica*. 2007;23(10):2275-84. doi: 10.1590/S0102-311X2007001000003. Portuguese.
5. Tesch FC, Oliveira BH, Leão A. [Measuring the impact of oral health problems on children's quality of life: conceptual and methodological issues]. *Cad Saude Publica*. 2007;23(11):2555-64. doi: 10.1590/S0102-311X2007001100003. Portuguese.
6. Ware JE Jr, Sherbourne CD. The MOS 36-item Short-form Health Survey (SF-36): conceptual framework and item selection. *Med Care*. 1992 Jun;30(6):473-83.
7. Bin Mubayrik A, Al Hamdan R, Al Hadlaq EM, AlBagieh H, AlAhmed D, Jaddoh H, et al. Self-perception, knowledge, and awareness of halitosis among female university students. *Clin Cosmet Investig Dent*. 2017 May 26;9:45-52. doi: 10.2147/CCIDE.S129679.
8. Baådoudi F, Trescher A, Duijster D, Maskrey N, Gabel F, van der Heijden GJ, et al. A Consensus-Based Set of Measures for Oral Health Care. *J Dent Res*. 2017 Apr 1:22034517702331. doi: 10.1177/0022034517702331.
9. Brondani MA, Bryant SR, MacEntee MI. Elders assessment of an evolving model of oral health. *Gerodontology*. 2007 Dec;24(4):189-95. doi:10.1111/j.1741-2358.2007.00186.x
10. Chalmers JM. Oral health promotion for our ageing Australian population. *Aust Dent J*. 2003 Mar;48(1):2-9. doi:10.1111/j.1834-7819.2003.tb00001.x
11. Tsakos G, Sabbah W, Chandola T, Newton T, Kawachi I, Aida J, et al. Social relationships and oral health among adults aged 60 years or older. *Psychosom Med*. 2013 Feb;75(2):178-86. doi:10.1097/PSY.0b013e31827d221b.
12. Rouxel P, Tsakos G, Chandola T, Watt RG. Oral health—a neglected aspect of subjective well-being in later life. *J Gerontol B Psychol Sci Soc Sc*. 2016 Mar 12. pii: gbw024. doi:10.1093/geronb/gbw024
13. Kiyak HA. Does orthodontic treatment affect patients' quality of life? *J Dent Educ*. 2008 Aug;72(8):886-94.
14. Dini GM, Quaresma MR, Ferreira LM. [Translation into portuguese, cultural adaptation and validation of the Rosenberg self-esteem scale]. *Rev Soc Bras Cir Plast*. 2004 Jan-Apr;19(1):41-52. Portuguese.

15. Oliveira BH, Nadanovsky P. Psychometric properties of the Brazilian version of the Oral Health Impact Profile-short form. *Community Dent Oral Epidemiol*. 2005 Aug;33(4):307-14.
16. Vieira LC. [Translation, adaptation and cultural validation of the face and content of Psychosocial Impact of Dental Questionnaire for Aesthetics in Brazil] [thesis]. São Paulo: Universidade Federal de São Paulo; 2010. 149p. Portuguese.
17. Colussi CF, Freitas SFT. [Epidemiological aspects of oral health among the elderly in Brazil]. *Cad. Saude Publica*. 2002 Sep-Oct;18(5):1313-20. doi: 10.1590/S0102-311X2002000500024. Portuguese.
18. Sáez-Prado B, Haya-Fernández MC, Sanz-García MT. Oral health and quality of life in the municipal senior citizen's social clubs for people over 65 of Valencia, Spain. *Med Oral Patol Oral Cir Bucal*. 2016 Nov 1;21(6):e672-e678.
19. Freires IA, Avilés-Reyes A, Kitten T, Simpson-Haidaris PJ, Swartz M, Knight PA, et al. Heterologous expression of *Streptococcus mutans* Cnm in *Lactococcus lactis* promotes intracellular invasion, adhesion to human cardiac tissues and virulence. *Virulence*. 2017 Jan 2;8(1):18-29. doi: 10.1080/21505594.2016.1195538.
20. Shinkai, RSA, Cury DB. [The role of dentistry in the interdisciplinary team: contributing to comprehensive health care for the elderly]. *Cad. Saude Publica*. 2000;16(4):1099-109. doi: 10.1590/S0102-311X200000400028. Portuguese.
21. Medeiros UV, Abreu CMW. [Protocol of buccal health promotion in companies]. *Rev Bras Odontol*. 2006;63(1/2):29-32. Portuguese.
22. Maciel SMM, Kornis GEM. [Orthodontics in oral public health policies: an example of equity in Juiz de Fora Federal University]. *Physis*. 2006;16(1):59-81. doi: 10.1590/S0103-73312006000100005. Portuguese.
23. Almeida RF, Pinho MM, Lima C, Faria I, Santos P, Bordalo C. [Association between periodontal disease and systemic pathologies]. *Rev Port Clin Geral*. 2006;22:379-90. Portuguese.
24. Friedman PK, Lamster IB. Tooth loss as a predictor of shortened longevity: exploring the hypothesis. *Periodontol 2000*. 2016 Oct;72(1):142-52. doi: 10.1111/prd.12128.
25. Vargas, AMD, Paixão, HH. [The loss of teeth and its meaning in the quality of life of adults who use the municipal oral health services of the Boa Vista Health Center, in Belo Horizonte]. *Cienc Saude Colet*. 2005 Oct-Dec;10(4):1015-24. doi: 10.1590/S1413-81232005000400024. Portuguese.
26. Bianco VC, Lopes ES, Borgato MH, Silva PM, Marta SN. [The impact on life quality due to oral conditions in people fifty years or above]. *Cienc Saude Colet*. 2010 Jul;15(4):2165-72. doi: 10.1590/S1413-81232010000400030. Portuguese.
27. Luo XP [Etiology, classification and systematic restorative treatment of tooth wear]. *Zhonghua Kou Qiang Yi Xue Za Zhi*. 2016 Oct 9;51(10):577-582. doi: 10.3760/cma.j.issn.1002-0098.2016.10.001. Chinese.
28. Baldani, MH, Brito WH, Lawder JAC, Mendes YBE, Silva, FFM, Antunes JLF. [Individual determinants of dental care utilization among low-income adult and elderly individuals]. *Rev Bras Epidemiol*. 2010 Mar;13(1):150-62. doi: 10.1590/S1415-790X2010000100014.
29. Natapov L, Sasson A, Zusman SP. Does dental health of 6-year-olds reflect the reform of the Israeli dental care system? *Isr J Health Policy Res*. 2016 Oct 5;5:26.
30. Mezzalira MF, Conceição EN. [Aesthetic Rehabilitation with porcelain laminate] [monography]. Federal University of Rio Grande do Sul. School of Dentistry; 2011 [Cited 2017 jul 10]. Available from: <http://hdl.handle.net/10183/37714>.