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Assessment of the psychological impact of dental aesthetics among undergraduate university students in Iraq

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Abstract

AIM: This study aimed to assess Iraqi university students' oral health-related quality of life (OHRQoL) according to sociodemographic variables and compare dental and non-dental students.

METHODS: A cross-sectional study was carried out for students in multiple Iraqi universities from June 15, 2022, to July 15, 2022. A total of 771 individuals participated in the study using an online questionnaire. A pre-tested and validated Arabic version of the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) was adopted as an evaluation tool. A *P* value of less than 0.05 was considered statistically significant. Reliability analysis was conducted using Cronbach's alpha.

RESULT: Cronbach's alpha score for the overall scales was 0.942, indicating excellent internal consistency. There were 69.8% (*n* = 538) dental students in the total sample. A significant difference was found between dental and non-dental students in the total PIDAQ scores and other subscale domains (*P* < 0.05). Statistically significant differences in means were also noted in the residency (*P* = 0.005) and household income of students (*P* = 0.000).

CONCLUSIONS: This study shows the reliability of the PIDAQ scale for assessing the psychological impact of dental aesthetics on undergraduate Iraqis. It was found that the perception of OHRQoL varies between dental and non-dental university students, and according to socioeconomic status and residency.

Keywords:

Aesthetics, dental students, oral health-related quality of life, questionnaires and surveys

Introduction

Dental appearance is a significant factor in facial attractiveness and can affect a person's first impression of someone's characteristics. Any condition affecting dental appearance may be a potential source of stigma, impede professional accomplishment, create unfavorable preconceptions, and lower self-esteem. Well-known rules in developed countries about the appearance of the face and

teeth do not copiously differ, and severe deviations are defined as improper.^[1,2]

Even minor deviations from community appearance norms result in a lack of confidence and the perception that others are "superior" among undergraduates. This negatively impacts their quality of life (QoL). Self-confidence is essential in a person's life to establish a solid professional reputation.^[3] QoL instruments have been created to address the increased understanding of the multidimensional nature of oral health and compensate for the shortcomings of traditional techniques. Several tools for measuring

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oral health-related quality of life (OHRQoL) are now being utilized to assess patients' reactions, functioning, and oral condition acceptance.^[4]

The Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) was established as an OHRQoL psychometric measure to examine the impact of dental aesthetics on the self-confidence of young adult orthodontic patients. This questionnaire was divided into four sections: dental self-confidence (DSC), social impact (SI), psychological impact (PI), and aesthetic concern (AC). Worldwide reviews have shown that the questionnaire has a good test quality in adults regardless of their social background.^[5]

"Dental self-confidence" proposes that dental aesthetics substantially impact an individual's emotional condition. "Social impact" assesses the potential challenges that an individual may have in social circumstances due to an unpleasant dental look, whereas "psychological impact" measures feelings of unhappiness or inferiority in contrast to others. "Aesthetic concern" refers to information associated with disapproval generated by one's dental appearance when looking in the mirror or seeing oneself in images or films.^[6]

Meanwhile, the PIDAQ, like most questionnaires, was created in English. It must be appropriately translated and culturally and socially adjusted to be used in non-English-speaking nations without losing its psychometric features. After translation into many languages, including Arabic, PIDAQ has been validated for use in adults. In addition, the original adult form of the questionnaire has been authorized for younger age groups.^[7,8]

Dental students have a good understanding of the differences between dental professionals' and laypeople's perspectives on dental aesthetics; this knowledge and awareness will help them develop treatment plans, which are both effective and meet their needs and expectations. To our knowledge, no previous study has compared dental and other university students' awareness of their dental appearance in Iraq. This study aims to assess the OHRQoL of university students in Iraq according to sociodemographic variables and to compare dental and non-dental students.

Materials and Methods

A cross-sectional study design was carried out for students in multiple Iraqi universities from June 15, 2022, to July 15, 2022. A total of 771 individuals participated in the study. The study sample was randomly collected through an online questionnaire using an Arabic version of the Google form through different social

media platforms (Facebook, WhatsApp, Telegram, LinkedIn, and others). Participants in the survey were informed of the voluntary nature of their participation, the confidentiality of their responses, and their right to withdraw from the study at any time and without explanation. They received no compensation for their efforts. Ethical approval was granted by the Research Ethics Committee (EA#153 on 7/6/2022).

A pre-tested and validated Arabic version of the PIDAQ was used as an evaluation tool [Appendix A].^[9] It is a 23-item questionnaire-based psychometric scale. Four subscales make up the original version. There is one positive domain, dental self-confidence (six items), and three negative domains: social impact (eight items), psychological impact (six items), and aesthetic concern (three items). Each item was evaluated on a five-point Likert scale ranging from 1 (not at all) to 2 (a little), 3 (somewhat), 4 (strongly), and 5 (very strongly). A score of 1 indicates that the item does not affect the QoL, whereas a score of 5 indicates that the item significantly affects the QoL.^[5]

To produce a consistent measurement of impact and facilitate the interpretation of the results, scores from the positive domain were reversed to align with scores from other negative domains. The total score for each domain was calculated by adding the scores of each question within that domain, and the total PIDAQ score was calculated by adding the totals of the four domains.

The sociodemographic questionnaire contained questions about age, gender, college and level of study, income, marital status, smoking habits, and residency.

Statistical analyses were performed using IBM SPSS Statistics for Windows (Version 26.0. Armonk, NY: IBM Corp.). A Kolmogorov-Smirnov test was conducted to check the normality of variables, and nonparametric tests, including the Mann-Whitney U-test, Kruskal-Wallis test, and Spearman's Rho test, were used to draw a meaningful conclusion because the data were not normally distributed. A *P* value of less than 0.05 was considered statistically significant. Reliability analysis was conducted using Cronbach's alpha.

Results

A total of 771 questionnaire respondents participated in the study. There were 69.8% (*n* = 538) dental students. The range and average ages of respondents were 18–25 and 20.8 ± 1.64 years, and the means \pm SDs for the total PIDAQ score, dental self-confidence, social impact, psychological impact, and aesthetic concern were 56.6 ± 20.1 , 17.8 ± 6.6 , 17.7 ± 8.4 , 14.5 ± 6.2 , and 6.5 ± 3.7 , respectively [Table 1].

There was no correlation between the age of participants with the total PIDAQ or its subscale scores ($P > 0.05$). In relation to gender, there were 72.1% ($n = 556$) female participants. Most respondents ($n = 315$, 40.9%) were in their second academic year. Sixth-year students responded in the lowest numbers ($n = 5$; 0.6%). Based on marital status, most respondents were single, while only 3.9% ($n = 30$) were married. Overall, 7.8% ($n = 60$) were smokers. Approximately 32.6% of the participants in this questionnaire have previously visited a dental clinic. Rural residents made up 17.1% ($n = 132$) of the total respondents compared to 82.9% ($n = 639$) living in urban areas. Cronbach's alpha score for the overall scales was 0.942, the standardized Cronbach's alpha was 0.943, and the values of Cronbach's alpha if an item was deleted ranged from 0.942 to 0.938 [Table 2], indicating excellent internal consistency.

Table 1: Descriptive statistics for the study variables

| | Minimum | Maximum | Mean | Std. Deviation |
|-------------------------------|---------|---------|-------|----------------|
| Age | 18 | 25 | 20.8 | 1.64 |
| Dental self-confidence domain | 6.00 | 30.00 | 17.86 | 6.62 |
| Social impact domain | 8.00 | 40.00 | 17.75 | 8.46 |
| psychological impact domain | 6.00 | 30.00 | 14.54 | 6.23 |
| Aesthetic concern domain | 3.00 | 15.00 | 6.50 | 3.76 |
| Total PIDAQ score | 23.00 | 115.00 | 56.67 | 20.1 |

Table 2: Reliability statistics for PIDAQ scale and α when item deleted

| | Scale mean if item deleted | Scale variance if item deleted | Corrected item-total correlation | Squared multiple correlation | Cronbach's alpha if item deleted |
|---------------------------------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Satisfied with appearance* | 53.76 | 378.17 | 0.50 | 0.64 | 0.94 |
| Proud of teeth* | 53.67 | 380.97 | 0.44 | 0.65 | 0.94 |
| Like to show teeth* | 53.77 | 376.94 | 0.46 | 0.67 | 0.94 |
| Pleased to see teeth in mirror* | 53.80 | 377.43 | 0.48 | 0.70 | 0.94 |
| Teeth are attractive* | 53.36 | 382.97 | 0.38 | 0.61 | 0.94 |
| Find tooth position nice* | 53.80 | 382.00 | 0.38 | 0.50 | 0.94 |
| Hold back when I smile | 54.37 | 367.10 | 0.68 | 0.57 | 0.93 |
| What others think | 54.53 | 369.66 | 0.67 | 0.71 | 0.93 |
| Offensive remarks | 54.40 | 366.49 | 0.70 | 0.71 | 0.93 |
| Hide my teeth | 54.43 | 364.39 | 0.73 | 0.64 | 0.93 |
| Inhibited in social contacts | 54.82 | 370.96 | 0.69 | 0.68 | 0.93 |
| People stare | 54.29 | 379.08 | 0.47 | 0.46 | 0.94 |
| Irritated on remarks | 54.27 | 368.32 | 0.63 | 0.56 | 0.94 |
| Worry about opposite sex | 54.52 | 365.88 | 0.72 | 0.69 | 0.93 |
| Envy | 54.54 | 374.48 | 0.55 | 0.50 | 0.94 |
| Somewhat distressed | 54.65 | 368.86 | 0.70 | 0.68 | 0.93 |
| Others have nicer teeth | 54.36 | 368.64 | 0.69 | 0.55 | 0.93 |
| Somewhat unhappy | 54.30 | 364.86 | 0.76 | 0.70 | 0.93 |
| Feel bad | 54.47 | 362.36 | 0.82 | 0.77 | 0.93 |
| Wish teeth looked better | 53.16 | 372.57 | 0.55 | 0.36 | 0.94 |
| Don't like teeth in mirror | 54.65 | 364.72 | 0.79 | 0.74 | 0.93 |
| Don't like teeth in photo | 54.43 | 361.32 | 0.79 | 0.82 | 0.93 |
| Don't like teeth on video | 54.43 | 360.76 | 0.78 | 0.81 | 0.93 |

Table 3 compares PIDAQ means and subscales according to the sociodemographic variables of the sample, and demonstrates a difference between dental students and non-dental students in the means of total PIDAQ scores and other domains, with significant differences found regarding psychological impact ($P = 0.013$), aesthetic concern ($P = 0.029$), and total PIDAQ score ($P = 0.012$). In relation to gender, except for social impact, female participants had lower mean values than male participants, with a significant difference recorded in psychological impact ($P = 0.018$).

Married students showed a notable difference in unmarried students in the dental self-confidence domain, with a P value of 0.05. Although the number of smokers was low in this study, the difference was notable among non-smokers in the social impact domain ($P = 0.01$). Living in rural areas appeared to substantially impact nearly all the domains, with mean values higher than those in urban areas in the total PIDAQ scores, indicating a significant difference ($P = 0.005$).

Responses differed significantly across the three categories of monthly income. Those with the highest income level group responded with the lowest mean values, and significant differences were recorded in three of the four domains (social impact, psychological impact, and aesthetic concern) and total PIDAQ scores, with a P value of (0.000) for all.

The independent variables (dental education, monthly income, and residency) had a significant relationship ($p = 0.032, p = 0.001, \text{ and } p = 0.021$, respectively) with total PIDAQ scores, as determined by linear regression analysis [Table 4].

Discussion

Individuals must have admirable facial characteristics to establish their aesthetic impression and respect physical attractiveness. The most noticeable aspects of a person's face are their eyes and smile. A person's self-perceived picture of dental aesthetics might affect their self-esteem, satisfaction, life quality, psychological state, and social relationships. Furthermore, analyzing a patient's dental aesthetic insight is critical for dentists to appreciate their requirements and manage their treatment expectations.^[10] In this study, it is worth noting that female participants were more satisfied with their dental appearance than male participants. The opposite was expected, keeping in mind that women, regardless of age, are generally more concerned with their dental aesthetics, as previous studies have found.^[11-13]

On the other hand, male participants are less demanding in appearance and performance due to the nature of their social life.^[14] In contrast, an earlier study discovered that men valued dental aesthetics more than women.^[15] In their study, El Mourad *et al.* reported that females try to cover their mouths with their hands and prefer to be photographed from the most attractive side of their faces.^[16] Total PIDAQ scores, as this study has revealed, showed no significant difference between the genders. Other researchers in different age groups reached similar conclusions.^[2,17-20] Researchers attributed these disparities in the literature to cultural changes and the impact of marketing, which made men as obsessed with their beauty and physical appearance as women. In addition, differences in participants' age, study techniques, and ethnic variations across the examined populations also played a role.^[21,22]

According to our study, dental students appear happier than students from other colleges, who seem dissatisfied with their dental appearance when confronted with mirrors, images, and videos. A significant difference was recorded in relation to total PIDAQ scores with a P value of 0.012. A prior study found that dental

Table 3: Comparison between PIDAQ and its subscales according to the sociodemographic variables

| Variable characteristics | n (%) | Social impact (Mean±SD) | P | Self-confidence (Mean±SD) | P | Psychological impact (Mean±SD) | P | Aesthetic concern (Mean±SD) | P | PIDAQ (Mean±SD) | P | |
|------------------------------|----------------------|-------------------------|----------|---------------------------|----------|--------------------------------|----------|-----------------------------|---------|-----------------|-----------|-------|
| College | Dentistry | 538 (69.8) | 17.4±8.3 | 0.212 | 17.5±6.6 | 0.073 | 14.1±6 | 0.013 | 6.3±3.7 | 0.029 | 55.6±20 | 0.012 |
| | Others | 233 (30.2) | 18.4±8.7 | | 18.5±6.4 | | 15.4±6.4 | | 6.8±3.7 | | 59.1±20 | |
| Gender | Male | 215 (27.9) | 17.7±8.7 | 0.887 | 18.0±6.4 | 0.569 | 15.3±6.4 | 0.018 | 6.8±3.8 | 0.116 | 58.0±19.7 | 0.216 |
| | Female | 556 (72.1) | 17.7±8.3 | | 17.8±6.7 | | 14.2±6.1 | | 6.3±3.7 | | 56.1±20.2 | |
| Marital status | Single | 741 (96.1) | 17.7±8.4 | 0.890 | 17.9±6.6 | 0.05 | 14.5±6.2 | 0.860 | 6.5±3.7 | 0.735 | 56.7±20.1 | 0.519 |
| | Married | 30 (3.9) | 18.2±9 | | 15.7±7 | | 13.9±5.3 | | 6.1±3.3 | | 53.9±20 | |
| Smoking | NO | 711 (92.2) | 17.9±8.5 | 0.009 | 17.8±6.6 | 0.644 | 14.6±6.2 | 0.215 | 6.5±3.7 | 0.082 | 57.0±20.1 | 0.080 |
| | Yes | 60 (7.8) | 15.2±7.5 | | 18.1±6.6 | | 13.4±5.5 | | 5.7±3.3 | | 52.6±18.8 | |
| Residency | Urban | 639 (82.9) | 17.3±8.2 | 0.002 | 17.8±6.6 | 0.799 | 14.2±6.1 | 0.002 | 6.3±3.6 | 0.009 | 55.7±19.7 | 0.005 |
| | Rural | 132 (17.1) | 19.9±9.0 | | 18.0±6.5 | | 16.0±6.5 | | 7.3±4.0 | | 61.3±21.0 | |
| Levels of study ^a | 1 st year | 124 (16.1) | 17.7±8.0 | 0.227 | 18.4±6.4 | 0.257 | 14.6±6.1 | 0.020 | 6.6±3.8 | 0.309 | 57.4±19.7 | 0.067 |
| | 2 nd year | 315 (40.9) | 18.6±8.8 | | 18.0±6.5 | | 15.4±6.4 | | 6.7±3.8 | | 58.9±20.7 | |
| | 3 rd year | 159 (20.6) | 17.0±8.2 | | 18.0±6.6 | | 13.6±5.7 | | 6.3±3.6 | | 55.0±19.2 | |
| | 4 th year | 101 (13.1) | 16.5±8.3 | | 17.0±7.0 | | 13.6±6.4 | | 6.0±3.8 | | 53.3±20.3 | |
| | 5 th year | 67 (8.7) | 17.4±7.8 | | 16.8±6.3 | | 13.6±5.4 | | 6.2±3.6 | | 54.1±18.7 | |
| | 6 th year | 5 (.6) | 14.8±6.1 | | 14.2±4.4 | | 13.6±2.1 | | 5.2±1.6 | | 47.8±7.3 | |
| Monthly income ^a | <400\$ | 121 (15.7) | 20.5±9.4 | 0.000 | 18.8±7.0 | 0.082 | 16.8±6.6 | 0.000 | 7.8±4.3 | 0.000 | 64.1±21.3 | 0.000 |
| | 400-600\$ | 574 (74.4) | 17.4±8.2 | | 17.8±6.5 | | 14.2±6.0 | | 6.3±3.6 | | 55.7±19.6 | |
| | >600\$ | 76 (9.9) | 15.8±7.2 | | 16.6±6.6 | | 13.2±5.9 | | 5.7±3.4 | | 51.5±18.9 | |

^aKruskal-Wallis test

Table 4: Linear regression analysis of the total PIDAQ score based on variables

| Model | Unstandardized coefficients | | Standardized coefficients | | t | Sig. | 95.0% Confidence interval for B | |
|-----------|-----------------------------|------------|---------------------------|--|-------|-------|---------------------------------|-------------|
| | B | Std. Error | Beta | | | | Lower bound | Upper bound |
| College | 3.32 | 1.549 | 0.076 | | 2.14 | 0.032 | 0.28 | 6.36 |
| income | -6.02 | 1.434 | -.15 | | -4.20 | 0.000 | -8.83 | -3.20 |
| residency | 4.41 | 1.910 | 0.08 | | 2.31 | 0.021 | 0.66 | 8.16 |

^aDependent Variable: Total PIDAQ score

students had superior oral healthcare knowledge and behavior compared to non-dental students.^[23–25] Doshi *et al.*^[26] observed that dental and medical undergraduates have more favorable perceptions of oral health behavior than students from other faculties.^[26] Other researchers mentioned that students from various academic disciplines had significantly different PIDAQ scores.^[27] However, another study concluded that dental students were more critical of dental aesthetics compared to non-dental students. The study's most exciting outcome was that most students were not envious of individuals with better smiles than them.^[28]

Our study findings revealed that academic levels directly influenced students' satisfaction with their dental appearance, with higher-level college students being more satisfied with their dental aesthetics than lower-level college students; a significant difference was reported in the psychological impact domain (P value of 0.02).

Similar findings were reported by Al-Saleh *et al.*, who found that students' comprehension and impression of dental aesthetics might alter as they move through their education. Those in their early academic study years appear to be more similar to laypeople than dental experts.^[12]

Another study found a link between education levels and dental aesthetic comfort. Unhappiness with dental aesthetics dropped as one's academic level increased.^[29] Chen *et al.* supported these conclusions.^[30]

As this study illustrated, rural resident students appeared to have a significant impact on practically all domains except for dental self-confidence, with mean values more significant than in urban settings. Total PIDAQ scores revealed a significant difference ($P = 0.005$). People residing in rural locations are more likely to suffer an apparent financial barrier to getting dental care due to the indirect costs associated with traditional dental treatment, and the dental attendance pattern is worse (in terms of frequency, continuity, and reason for visits).^[31]

Income status is a fundamental driver of health. At each occupational grade level, those of a higher social class experience more excellent health and self-confidence.^[32] This study confirmed this view; there were significant differences in three domains (social impact, psychological impact, and aesthetic concern), and the total PIDAQ scores were documented at a value of 0.00. In contrast to these findings, another study revealed that students with high monthly incomes might be excessively critical of even minor dental deviations, resulting in a higher impact on their psychosocial wellbeing.^[27]

Due to the online nature of the questionnaire, it was impossible to determine the sample type, and the majority of the sample consisted of female participants, which can be attributed to a large number of female participants studying dentistry and the small number of respondents from the sixth academic year. In addition, the sample targeted a specific age group, so there was no significant difference between respondents' total PIDAQ scores.

Conclusions

This study demonstrates the validity of the PIDAQ scale for assessing the psychological impact of dental aesthetics among Iraqi undergraduates. It was found that the perception of OHRQoL differs between dental and non-dental university students, socioeconomic status, and residency.

Author contribution

All authors actively participated in the manuscript's findings and have revised and approved the final version of the manuscript.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Appendix A

Appendix A: Alharbi, *et al.* Arabic version of PIDAQ

| ت | المحور/السؤال | ابدا | احيانا | الى حد ما | كثيرا | كثيرا جدا |
|---------------------------------------|---|------|--------|-----------|-------|-----------|
| | | 1 | 2 | 3 | 4 | 5 |
| الثقة بالنفس المتعلقة بالاسنان | | | | | | |
| 1 | انا راض عن مظهر أسناني | | | | | |
| 2 | انا فخور بأسناني | | | | | |
| 3 | أحب أن أظهر أسناني عندما أبتسم | | | | | |
| 4 | يسعدني أن أرى أسناني في المرأة | | | | | |
| 5 | أسناني جذابة للآخرين | | | | | |
| 6 | يعجبني ترتيب وانتظام اسناني الحالي | | | | | |
| التأثير الاجتماعي | | | | | | |
| 7 | اتراجع عندما أبتسم حتى لكيلا تظهر أسناني بشكل كبير | | | | | |
| 8 | عندما اكون مع اشخاص لا اعرفهم جيدا, اقلق احيانا حول رايهم واعتقادهم بأسناني | | | | | |
| 9 | أخشى أن يدلي الآخرون بملاحظات مسيئة عن أسناني | | | | | |
| 10 | أحيانا أجد نفسي اضع يدي أمام فمي لإخفاء أسناني | | | | | |
| 11 | انا نوعا ما اقل في التواصل الاجتماعي بسبب اسناني | | | | | |
| 12 | أعتقد أحيانا أن الناس يحدقون في أسناني | | | | | |
| 13 | التعليقات على أسناني تزعجني حتى عندما تكون على سبيل المزاح | | | | | |
| 14 | اقلق حيانا حول راي الجنس الآخر بشأن أسناني | | | | | |
| التأثير النفسي | | | | | | |
| 15 | احسد او اغبط الناس الذين يملكون أسنان جميلة | | | | | |
| 16 | احيانا اكون محبطا عندما أرى أسنان الآخرين | | | | | |
| 17 | أعتقد أن معظم الناس الذين أعرفهم لديهم أسنان أجمل من اسناني | | | | | |
| 18 | في بعض الاحيان أكون غير سعيد إلى حد ا بمظهر أسناني | | | | | |
| 19 | أشعر بالسوء عندما أفكر كيف تبدو أسناني | | | | | |
| 20 | أتمنى لو ان اسناني تبدو بشكل أفضل | | | | | |
| السلوك الجمالي | | | | | | |
| 21 | لا أحب أن أرى أسناني في المرأة | | | | | |
| 22 | لا أحب أن أرى أسناني في الصور | | | | | |
| 23 | لا أحب أن أرى أسناني عندما أشاهد فيديو لنفسني | | | | | |