

## Development of the Indonesian version of the Psychosocial Impact of Dental Aesthetic Questionnaire (PIDAQ) in Prosthodontics

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### Abstract

The Psychosocial Impact of Dental Aesthetic Questionnaire (PIDAQ) is an instrument that measures several aspects of oral health-related quality of life, as it relates to patients with dental aesthetic impairments. However, the PIDAQ was developed for orthodontic patients, who typically have aesthetic concerns that differ from those of prosthodontic patients. The aim of this study was to develop an Indonesian version of the PIDAQ, focused on prosthodontic patients. The questionnaire was translated into Indonesian, back-translated, pretested, and cross-culturally adapted. We carried out qualitative interviews of 20 subjects, age 24–72 years and with equal proportion of gender. All patients were undergoing aesthetic prosthodontic treatments, and the questions focused on the perceived psychosocial impact of treatment. Following reconciliation by an expert committee, on the basis of the original version, the questionnaire was translated, back-translated, and the outcomes of the qualitative interviews were used to finalize the revised instrument. A modification of three additional items and adjustment of responses was made to accommodate the appropriate within target settings. After the pretesting, the adapted Indonesian PIDAQ emerged as an instrument that was easy to use with adult and elderly patients undergoing prosthodontic treatments. However, further analyses of the questionnaire's psychometric properties are needed to confirm its validity and reliability in target settings.

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### Introduction

The relationship between orofacial aesthetics and quality of life (QoL) has been a central research focus in dentistry, particularly in orthodontics.<sup>1,2</sup> Individual dissatisfaction with dental appearance due to dental irregularities or malocclusions negatively affects social and psychological parameters.<sup>3</sup> Aesthetic impairments arising from malocclusions are usually not accompanied by pain, loss, and/or damage to anatomical structures, and these effects may start during childhood and progress through adulthood if not treated promptly. This condition

is different from aesthetic impairments found in patients undergoing prosthodontic treatments. Here, aesthetic impairments are often associated with tooth loss, loss of tooth structure, or abnormalities that also contribute to a functional disability. Consequently, the psychological effects that may arise among patients undergoing prosthodontic treatments may differ from those resulting from malocclusions that are commonly observed among patients undergoing orthodontic treatments.

Questions surrounding orofacial aesthetics and QoL abound because research on this topic is scarce. There were a few publications over the last 20 years that examined QoL among prosthodontic patients with aesthetic impairments. Most QoL studies related to prosthodontics focus on tooth loss (number and position), the type of prosthodontic treatment (between fixed and removable dentures or between conventional dentures and implants), as well as evaluation before and after treatment.<sup>4-7</sup> The results showed that, among prosthodontic

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patients, the greatest impacts on QoL involve functional and psychological limitations.<sup>8</sup> Patients are frequently motivated to pursue prosthodontic treatment for aesthetic reasons, especially when the anterior teeth are involved.<sup>5,6,9,10</sup>

This suggests that patients adapt well to functional limitations; however, when aesthetics concerns arise, adaptation can be more difficult. The aesthetic appeal of the anterior teeth can increase physical attractiveness, which in turn affects self-confidence, perceived body image, and social interactions.<sup>5,6,11,12</sup> The appearance of teeth can greatly affect an individual's physical appearance. Newton reported that dental appearance had an effect on individual judgment on first encounters.<sup>11</sup> Similar studies by Eli et al. and Kershaw et al. that decayed anterior teeth exerted a negative impact on the perception of a person's physical attractiveness.<sup>13,14</sup> These studies did not address other dimensions that could be potentially affected, except psychological variables and social interaction. The same results were found during aesthetic research in orthodontics. There exists an unmet need for information regarding the psychosocial impact of orofacial aesthetic impairments among prosthodontics patients, and the contributions of orofacial aesthetics to QoL.

A valid and reliable measurement tool is one way to evaluate treatment outcomes. Commonly used generic instruments that assess various dimensions that affect QoL include the Oral Health Impact Profile (OHIP), Dental Impact on Daily Living, and Oral Impact on Daily Performance questionnaires.<sup>10,15,16</sup> Of the three questionnaires, OHIP is most often used and has been variously adapted. Wong et al. developed the OHIP-Esthetic consisting of 14 items, to assess the effects of aesthetic impairments on QoL; however, this questionnaire only addresses teeth whitening.<sup>15</sup> Other studies use OHIP, but only six items on the battery are related to the appearance of the respondent's teeth.<sup>16</sup> Dannemand et al. used six items from the OHIP, one of which was different from the six items that John et al. set forth as items that assess dimensions of orofacial appearance following exploratory factor analysis of the OHIP questionnaire.<sup>17</sup> This difference raises the question as to whether or not the OHIP can specifically assess the psychosocial impacts of aesthetic impairments in prosthodontic patients. In orthodontics, the Psychosocial Impact of

Dental Aesthetic Questionnaire (PIDAQ) was developed to assess the psychosocial effects of dental aesthetics on malocclusion in young adults.<sup>3</sup> Although the PIDAQ was developed specifically for orthodontic application, it assesses aesthetic items that are also common to the OHIP. Thus, the PIDAQ evaluates the psychosocial impact of anterior dental implant treatments and informs our understanding of aesthetic orofacial impairments in prosthodontic patients.<sup>5,18</sup>

This study sought to develop an instrument for assessing the psychosocial impact of orofacial aesthetics among Indonesians using a cross-culturally adapted version of the PIDAQ as the basic instrument for assessment of patients undergoing prosthodontic treatments. We received approval from the Ethics Committee of the Faculty of Dentistry, University of Indonesia (No.105/Ethical Approval/FKGUI/XI/2017).

## Materials and methods

### Description of the PIDAQ

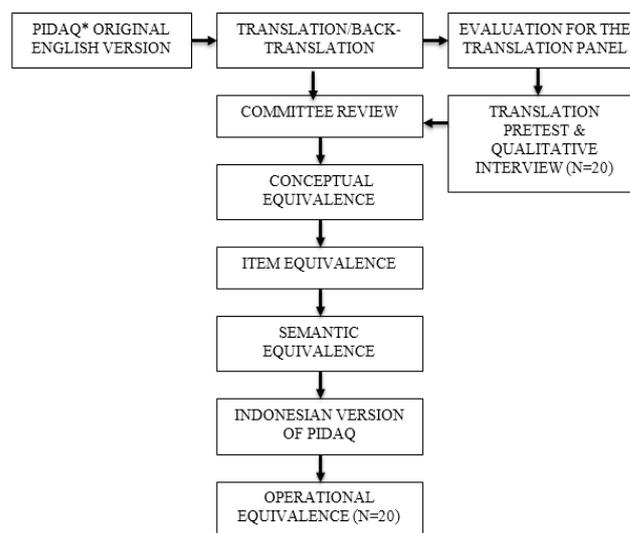
The PIDAQ is a questionnaire that assesses the psychosocial impact of dental aesthetics in young adults (18–30 years old). The Aesthetics and Social Aspects scales of the Orthognathic Quality of Life Questionnaire were adapted, reformulated, and combined with additional items to assess the aesthetic impact of malocclusions.<sup>3</sup> This psychometric instrument is composed of 23 negatively and positively worded items, divided into one positive and three negative domains. As shown in Table 1, the PIDAQ consists of four dimensions: aesthetic concern (three items), psychological impact (six items), social impact (eight items), and confidence in dental conditions (six items) as shown in Table 1. The PIDAQ has good validity and reliability and has also been translated into several languages.<sup>19–22</sup> This self-administered questionnaire requires the respondent to indicate each item on a 5-point Likert scale, ranging from 0 (no impact of dental aesthetics on QoL) to 4 (maximal impact of dental aesthetics on QoL) within a reference time period. The numerical values are 0 = not at all, 1 = a little, 2 = somewhat, 3 = strongly, and 4 = very strongly.<sup>3</sup>

Dimension	Item
Dental Self-Confidence	1. I am proud of my teeth.
	2. I like to show my teeth when I smile.
	3. I am pleased when I see my teeth in the mirror.
	4. My teeth are attractive to others.. I am satisfied with the appearance of my teeth.
	5. I find my tooth position to be very nice.
	6. I find my tooth position to be very nice.
Social Impact	7. I hold myself back when I smile so my teeth don't show so much.
	8. If I don't know people well, I am sometimes concerned what they might think about my teeth.
	9. I'm afraid other people could make offensive remarks about my teeth.
	10. I am somewhat inhibited in social contacts because of my teeth.
	11. I sometimes catch myself holding my hand in front of my mouth to hide my teeth.
	12. Sometimes I think people are staring at my teeth. Remarks about my teeth irritate me even when they are meant jokingly.
	13. I sometimes worry about what members of the opposite sex think about my teeth.
	14. I sometimes worry about what members of the opposite sex think about my teeth.
Psychological Impact	15. I envy the nice teeth of other people
	16. I am somewhat distressed when I see other people's teeth.
	17. Sometimes I am somewhat unhappy about the appearance of my teeth.
	18. I think most people I know have nicer teeth than I do.
	19. I feel bad when I think about my teeth look like. I wish my teeth looked looked better.
Aesthetic Concern	20. I don't like to see my teeth in the mirror.
	21. I don't like to see my teeth in the photographs.
	22. I don't like to see my teeth when I look at a video of myself.

**Table 1.** The original version of PIDAQ. Respos: 0= not at all, 1= a little, 2= somewhat, 3= strongly, 4= very strongly.

### Formation of the Indonesian version of PIDAQ

We used a recent protocol for cross-cultural adaptation of research instruments.<sup>23</sup> The sequences of the cross-cultural adaptation process are shown in Figure 1.



**Figure 1.** Flow chart of the cross-cultural adaptation process.

#### Translation

The first stage involved translating the PIDAQ into Indonesian. This was independently completed by two Indonesians who were fluent in English. The first translators were an English lecturer at the University of Indonesia and the other was a PhD student in dentistry. After discussion, the first draft of the translated instrument was synthesized.

#### Back translation

The first translation was translated back into English by two native English speakers who were also fluent in Indonesian. Both translators were native English speakers: the first one was a British citizen who had lived in Indonesia for more than 10 years; the second translator was an Indonesian citizen who was born and lived in the United States of America for 9 years, but now lives in Indonesia. The synthesized version was developed after discussion between the two translators.

## Translation panel evaluation

The synthesized versions of the translation and back translation were compared. The independent translator, the translators, and the back translators were invited to assess the translation literally and determine if both translated and back-translated versions held equivalent meaning.

## First pretest and qualitative interview

In order to achieve semantic equivalence, the translated version was tested on 20 subjects to assess their understanding of each item. The subjects were a convenience sample, consisting of equal numbers of males and females, aged 24–73 years. All subjects were individuals with aesthetic impairments who sought treatment in the Prosthodontic Clinic at Faculty of Dentistry Dental Hospital, University of Indonesia, Jakarta, Indonesia. The pretest took 1 month to complete, starting in December 2017 and ending in January 2018. All subjects completed the questionnaire and were interviewed while in the examination room. Each subject was offered an incentive to encourage his or her participation. The subjects were asked to complete the questionnaire and comment on words and sentences that were difficult to understand. These comments were written on a paper attached to the questionnaire. Then the researcher interviewed each subject to explore the confusing items and asked them about other factors relating to dental aesthetics that influence their lives. On average, the total time spent was about 20–30 min long.

## Expert committee

The expert committee consisted of one methodologist who was also a psychiatrist, language professionals, dental health professionals, and translators. This meeting was to confirm that all items were translated correctly from the original version and achieved equivalence in four areas: conceptual, semantic, item, and operational.<sup>24</sup> The original version of PIDAQ, the pretested translated version and the back-translated version were compared by the committee. Feedback from the pretest was discussed to identify the relevant psychosocial impact of aesthetic concerns of prosthodontic patients. The instrument format, instructions,

mode of administration and measurement methods were assessed to adapt usage to the Indonesian setting. A revised version was set as the final iteration of the instrument.

## Second pretest

The second pretest was performed on different 20 subjects, consisting of 12 females and 8 males, aged 20 to 69 years. This stage was conducted to examine the semantic equivalence, item equivalence, and operational equivalence in use. The subjects were patients recruited as a convenience sample from the Prosthodontic Clinic at Faculty of Dentistry Dental Hospital, University of Indonesia, Jakarta, Indonesia. Subjects were asked to complete the adapted questionnaire, then were interviewed about what they thought each questionnaire item and response option meant.

## Final version of the Indonesian version of PIDAQ

After reporting the outcomes of the second pretest, the final version was generated. Final adjustments were made after the agreement among all expert committee members was reached.

## Results

We did not encounter much difficulty throughout the questionnaire translation process. Four items out of 23 posed translation challenges. One of the drawbacks of the forward–backward translation system was that, when the translators were aware that their work would be evaluated by back translators, they tended to generate literal translations and there were several problems that emerged from this process. First, the translators experienced difficulties finding an equivalent Indonesian word to explain various English concepts. Second, in many cases, there were several choices of equivalent words because the exact translated word was not common to the Indonesian language. Table 2 shows the items that were difficult to translate. For example, the words and phrases “irritate,” “feel bad,” and “distress” describe internal feelings that do not carry an identical meaning in Indonesian. For example, the word equivalent of “irritate” could be “kesal”

(“upset”) or “tidak nyaman,” (“uncomfortable”); therefore, the literally translated word was “iritasi” (“irritation”). However, when this was back-translated to English, the word “irritate” did not show up; rather, it translated as “upset” and “uncomfortable”. These issues were clarified after completion of the first pretest and recommended adjustments were discussed by the expert committee.

The first pretest involved administration of the translated questionnaire and subject interviews to establish conceptual and item equivalence (content validity). The gender distribution was equal, and ages ranged from 24 to 73 years (3).

The included subject criteria were meant to represent the target settings for the developed instrument. The interview sought to explore the relevant psychosocial impact of prosthodontic aesthetic concerns. As a result of the interviews, we found that subjects felt that most items were relevant factors relating to the psychosocial impact of aesthetic impairments. The subjects who wore dentures reported sometimes feeling embarrassed to open their mouths to talk or smile widely because of the unaesthetic nature of their prostheses. Subjects also reported feeling afraid that ill-fitted dentures would fall out of their mouths. Younger subjects expressed concern over the psychosocial impact of looking older than their actual ages if their teeth were not replaced. The older subjects were less affected by the social impact items on the questionnaire; they believed that unaesthetic aspects of their condition should be accepted gracefully as part of growing old.

Most subjects had difficulty understanding the values they could select on each scale because the response choices are not commonly used in Indonesia. The words “not at all,” “a little,” “somewhat,” “strongly,” and “very strongly,” if translated to Indonesian, will be “sama sekali tidak,” “sedikit,” “agak,” “kuat” dan “sangat kuat.” These words are not common response used on questionnaires in Indonesia. The subjects also questioned the time period queried by the questionnaire. Were they to respond according to how they felt now, before, or after wearing dentures?

The original, translated, back-translated version, and the result of first pretest were used as references for an expert committee that evaluated the translated questionnaire. On the basis of this evaluation, the subjective judgement of the author, and the expert feedback, three

items were added to the instrument (Table 4). The additional items were placed after the original items and thus did not alter the instrument's original structure. The Likert scale of the original version was changed to range from 1 to 5 were 1 = not suit all to 5 = very suitable.

No.	Item
Q9	I'm afraid other people could make <u>offensive remarks</u> about my teeth.
Q13	Remarks about my teeth <u>irritate me</u> even they are meant jokingly
Q16	I am somewhat <u>distressed</u> when I see other people's teeth
Q19	I <u>feel bad</u> when I think about what my teeth look like

**Table 2.** Questions that were difficult to translate.

Characteristics (n=20)	1 <sup>st</sup> pretest & qualitative interview N (%)	2 <sup>nd</sup> pretest N (%)
Age		
18- 30 (young adult)	5 (25)	8 (40)
31-59 (adult)	10 (50)	10 (50)
60-74 (elderly)	5 (25)	2 (10)
Gender		
Male	10 (50)	8 (40)
Female	10 (50)	12 (60)
Aesthetic condition		
Aesthetically impaired	20 (100)	14 (70)
Removable	12 (60)	5 (25)
Fixed	8 (40)	9 (45)
Aesthetically good	0	6 (30)

**Table 3.** Characteristics of patients who pretested the Indonesian version of the Psychosocial Impact of Dental Aesthetic Questionnaire (PIDAQ).

No.	New items
Q24	I am worried about the opinion of people I know about my teeth than my opinion.
Q25	Sometimes I feel older because of my teeth.
Q26	I feel my teeth look unnatural.

**Table 4.** New items pertaining to psychosocial impact of impaired aesthetics for patients receiving prosthodontic treatments.

The second pretest evaluated the operational equivalent of the questionnaire. After completing the questionnaire, subjects were

asked about their understanding of the instruction. All subjects agreed that the format of the questionnaire was easy to follow and the instructions on how to complete the questionnaire were understandable (Table 5).

Area tested	Result
Format and instruction of the questionnaire: Did you have any difficulty to complete the questionnaire?	All subjects did not have any problem to follow the instruction. Had to be careful when responded between items asked positively to negatively (Q6 to Q7)
Was the instruction easy to follow?	Most respondents had no difficulty to understand the question.
Wording of questions: Were there any questions that you found difficult to understand?	
Time to complete:	3-15 minutes
How long the questionnaire took to complete?	

**Table 5.** Summary of findings from the second pretest of the Indonesian version of the Psychosocial Impact of Dental Aesthetic Questionnaire (PIDAQ).

## Discussion

Questionnaires are a common method for measuring patients' oral health-related quality of life (OHRQoL). Most OHRQoL instruments have English versions. In order to use foreign instruments in other cultural contexts and with different languages, these instruments need to be translated, cross-culturally adapted, and validated. Guidelines have been established for cross-cultural adaptation in order to ensure that the translated version is valid and comparable with the original questionnaire. In the present study, we carefully followed the methodology for translation and cross-cultural adaptation of questionnaires proposed by Gjersing et al. and Beaton et al.<sup>23,24</sup> Therefore, the psychometric analysis will be reported in a companion paper.

We encountered difficulties during the process of translation. Specifically, it was difficult to find equivalent Indonesian words to accurately describe socio-emotional items. Similar challenges were also reported by Saub when translating OHIP into a Malay version.<sup>25</sup>

In this study, qualitative interviews with patients were performed at the first pretest to assess concept and item equivalence. A convenience sample was used to gain basic information pertaining to how aesthetic

impairments, as those which serve as indications for prosthodontic treatment, affect people's lives in the psychosocial dimension, and across age groups from young adolescents to the elderly in Indonesia. From these interviews, we found that the factors that most impacted aesthetic impairments among orthodontic patients were similar to those found among prosthodontic patients in Indonesia. We also discovered that younger and older or elderly subjects had different responses about the psychosocial impact of their aesthetic appearance.

During the process of cross-cultural adaptation, new items were added to the instrument. During our literature review, we found that a questionnaire developed by Wolfart et al. and Mehl et al. addressed the psychosocial impact of aesthetic impairments.<sup>26,27</sup> These authors used expressions such as "avoid smiling," "uncomfortable about appearance," "wish for different teeth," "hiding teeth," "feel old because of teeth," and "dissatisfaction with artificial teeth." The outcomes of the qualitative interviews and literature reviews were discussed by experts, and then reconciled to determine the relevant items for use in prosthodontics settings. On the basis of the results of this process, three new items were added. It is possible that this altered the structure of the original instrument and analyses, including factor analyses, are needed. However, because these items were added at the end of the instrument, they will not change the structure of the translated questionnaire and are easily distinguished.

Even though this cross-cultural adaptation process followed a recommended process, we are only reporting the content validity of the Indonesian version of the PIDAQ. Future research should include a larger sample, more broadly inclusive of age, gender, and prosthodontic aesthetics to achieve construct, discriminant, and convergent validity and determine the reliability of the questionnaire. After this, the cross-culturally adapted PIDAQ might be a useful addition to clinical settings in Indonesia.

## Conclusions

We successfully translated the English-language version of the PIDAQ, used to assess prosthodontic aesthetic concerns, for use in Indonesia. Three items were added to provide common perceived psychosocial impacts of

prosthodontics patient with or without prostheses based on the qualitative interview and cross-cultural adaptation process. Further studies are needed to confirm its validity and reliability among patients of different cultures, ages, and different aesthetic impairments.

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### Declaration of Interest

The authors report no conflict of interest.

Pilihlah jawaban yang paling sesuai dengan Anda terkait penampilan gigi asli dan atau gigi tiruan Anda saat ini.

No	Pernyataan	Sangat tidak sesuai					Sangat sesuai
		1	2	3	4	5	
1	Saya bangga akan gigi saya	<input type="checkbox"/>					
2	Saya suka memperlihatkan gigi saya saat tersenyum.	<input type="checkbox"/>					
3	Saya senang melihat gigi saya di cermin.	<input type="checkbox"/>					
4	Gigi saya menarik bagi orang lain.	<input type="checkbox"/>					
5	Saya puas dengan penampilan gigi saya.	<input type="checkbox"/>					
6	Saya merasa susunan gigi saya sangat bagus.	<input type="checkbox"/>					
7	Saya berusaha tidak tersenyum lebar agar gigi saya tidak terlalu terlihat.	<input type="checkbox"/>					
8	Jika saya tidak terlalu mengenal seseorang, saya terkadang khawatir dengan apa yang mereka pikirkan tentang gigi saya.	<input type="checkbox"/>					
9	Saya khawatir orang lain membuat komentar yang menyinggung mengenai gigi saya.	<input type="checkbox"/>					
10	Terkadang saya mengalami hambatan dalam berinteraksi dengan orang lain karena gigi saya.	<input type="checkbox"/>					
11	Terkadang saya menyadari jika sedang menutupi mulut dengan tangan untuk menyembunyikan gigi.	<input type="checkbox"/>					
12	Terkadang saya merasa orang lain sedang menatap gigi saya.	<input type="checkbox"/>					
13	Komentar mengenai gigi saya membuat saya terganggu walaupun hanya bercanda.	<input type="checkbox"/>					
14	Saya terkadang khawatir pada pendapat lawan jenis mengenai gigi saya.	<input type="checkbox"/>					
15	Saya iri dengan gigi orang lain yang bagus.	<input type="checkbox"/>					
16	Saya agak stres ketika melihat gigi orang lain.	<input type="checkbox"/>					
17	Terkadang saya kurang senang akan penampilan gigi saya.	<input type="checkbox"/>					
18	Saya merasa kebanyakan orang yang saya kenal memiliki gigi yang lebih bagus dari saya.	<input type="checkbox"/>					
19	Saya sebal ketika memikirkan penampilan gigi saya.	<input type="checkbox"/>					
20	Saya berharap gigi saya tampak lebih baik.	<input type="checkbox"/>					
21	Saya tidak suka melihat gigi saya di cermin	<input type="checkbox"/>					
22	Saya tidak suka melihat gigi saya dalam foto	<input type="checkbox"/>					
23	Saya tidak suka melihat gigi saya di rekaman video	<input type="checkbox"/>					
24	Saya lebih khawatir pendapat orang yang saya kenal mengenai gigi saya dibandingkan pendapat saya.	<input type="checkbox"/>					
25	Terkadang saya merasa terlihat lebih tua karena gigi saya.	<input type="checkbox"/>					
26	Saya merasa gigi saya terlihat tidak alami.	<input type="checkbox"/>					

Figure 2. The final version of the Indonesian Psychosocial Impact of Dental Aesthetic Questionnaire (PIDAQ).

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