

Development of a Japanese version of the Oral Impacts on Daily Performance (OIDP) scale: a pilot study

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Abstract: The Oral Impacts on Daily Performance (OIDP) is a well-known oral health-related QOL instrument used internationally. The aim of this study was to develop and test a Japanese version of the OIDP for use in interviews. Following an internationally established method, the OIDP scale was translated using standardized methodology that consisted of forward translation, pilot study and backward translation. A pilot study was carried out using the revised version with 47 local residents (range, 40-105 years). In the item analysis of this study, there were no missing values or ambiguous responses. Twenty-eight percent of the participants replied that they 'had discomfort caused by an oral health problem' in the 'eating' items. Cronbach's alpha coefficient was 0.77, indicating the internal consistency reliability of the questionnaire. Denture wearers had significantly higher OIDP scores in covariance analysis with age and sex as adjustment factors ($P < 0.05$). Based on the results, the questionnaire was re-evaluated. A back translation was produced and approved by the original author. Further assessment and validation of this scale is needed in a study with larger sample size. (J. Oral Sci.

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Introduction

Quality of life (QOL) has been related to the degree to which an individual is able to enjoy the significant possibilities of life (1). Oral health conditions have an impact on QOL because they can affect the physical and psychological wellbeing of an individual (2). Since the 1990s, QOL scales that are specific to oral health have been developed in conjunction with numerous QOL studies in the field of oral health care. The Oral Health Impact Profile (OHIP) (3), General Oral Health Assessment Index (GOHAI) (4), and Oral Impacts on Daily Performance (OIDP) (5) are representative QOL scales related to oral health. Many studies have been conducted using these scales, including translated versions, in a number of countries (6-8). Japanese versions of the OHIP and GOHAI have been developed (9-11) and used primarily in areas of occupational health and regional health care (12). However, a Japanese version of the OIDP has not been developed yet.

The OIDP was created based on the concepts of the WHO's International Classification of Impairments, Disabilities, and Handicaps (13). Three versions of the OIDP have been developed and translated into several languages, including an interview and self-administered questionnaire for adults, and a separate one for children

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(14-19). The interview and self-administered questionnaire both assess the degree to which oral health problems have affected the life of the participant over the previous 6 months. The OIDP measures this by scoring the frequency or continuous occurrence of problems that have affected common daily activities during the past 6 months, and it evaluates the participant by calculating a total score (OIDP score). According to this scale, a higher score indicates a lower QOL. The OIDP determines whether an oral problem exists and evaluates the severity and degree to which the life of the patient has been deleteriously affected by the problem.

In recent years, the QOL scale has more often been used to study need assessments and plan oral health services (20-24). In this context, it is anticipated that increasing the available options for QOL scales will contribute to further development of QOL research in Japan. Thus, we focused on the OIDP as an oral health-related QOL scale and sought to develop a Japanese version of the OIDP.

Materials and Methods

We developed a Japanese version of the OIDP in accordance with internationally established psychometric methods (25). Having obtained permission from the original author to develop a Japanese version, two translators worked separately to transcribe the OIDP scale from English into Japanese.

The 10-item OIDP questionnaire focused on the impact of oral health on the performance of daily activities, such as eating, speaking, cleaning teeth or dentures, undertaking light physical activities, going out, sleeping, relaxing, smiling, enjoying contact with other people, and emotional stability. The frequency and severity of each reported oral health impact were then further assessed. Finally, each impact was attributed to a specific oral condition, as indicated by the respondents. The OIDP score is expressed as the sum of the different performance scores (performance score = severity score \times frequency score) divided by the maximum possible score, and then multiplied by 100 to provide a percentage score. Both frequency and severity scores were expressed on a scale from 0 to 5. Severity was assessed at six levels, from no effect to very severe effects on everyday life.

The translations were compared by a focus group consisting of translators and specialists in public health and psychometrics. After discussing discrepancies between the two translations with the focus group, we generated a preliminary version of the Japanese-language OIDP scale. We then implemented a pilot study with the preliminary version, with local residents as subjects. Subjects completed the OIDP questionnaire in face-to-face interviews, all of

which were conducted by a single interviewer. Items relevant to the scale were analyzed based on the results of the pilot study, and data deficiencies and response patterns were examined and verified.

The concurrent validity was checked by correlation analysis using SPSS (version 10.1). We determined that the criteria for concurrent validity would be satisfied if the correlation coefficient between each item and the related domain score was higher than 0.4 (25). To ensure internal consistency and reliability, we calculated Cronbach's alpha coefficient (26). Construct validity was evaluated by comparing the OIDP scores with the objectively assessed oral status. It was hypothesized that a modest correlation existed between the OIDP score and the presence of removable prostheses. Finally, we reviewed the language of the survey items and the format of the questionnaire based on suggestions made by the interviewer and respondents.

Prior to conducting the interviews, we explained the survey to the subjects and informed them that their participation was voluntary. Information that might identify individuals was kept confidential, and responses were analyzed in such a way that they could not be traced back to an individual respondent.

Results

In 2004, we used the preliminary Japanese version of the OIDP scale in a pilot study that involved 47 residents (19 males and 28 females) of Kyoto and Naze, Japan, who participated in municipal health checkups. The average age of the subjects was 69 years (range, 40-105 years), with 13% of the participants in their 40s, 17% in their 50s, 32% in their 60s, 15% in their 70s, and 23% over the age of 80 years.

Forty-five percent of the participants responded that oral health problems had affected their daily life in some way over the past 6 months. The proportion of participants reporting problems increased with age among participants between the ages of 50 and 80 years, whereas this trend decreased among participants over the age of 80 years. Fifty-seven percent of removable denture wearers and 35% of individuals without dentures indicated that oral discomfort had affected their lives. In addition, denture wearers had significantly higher OIDP scores (6.5 versus 0.7) in a covariance analysis with age and sex as adjustment factors ($P < 0.05$).

In our item analysis, the missing value rate was 0% and no ambiguous responses were recorded. More than 16% replied that they 'had trouble caused by an oral health problem' in the 'eating', 'mental stability', 'conversation', and 'laughing' items (Table 1). Trouble regarding 'cleaning teeth or dentures' and 'smiling' were unlikely to have

impacts on daily performance. The mean (\pm SD) OIDP score was 3.5 ± 7.1 (range, 0-38). Furthermore, among those who reported that they had experienced discomfort, 82% replied that ‘these discomforts affected my daily life’. An examination of internal consistency and reliability revealed that the corrected item-total correlation coefficients for all items, except ‘teeth cleaning’ and ‘sleep’, satisfied the respective criteria (Table 2). The Cronbach’s alpha coefficient for our reliability analysis was 0.772.

Discussion

We developed a Japanese version of the OIDP for use in an interview setting. Many interview-based surveys involved elderly subjects, and numerous studies have applied the interview version of the OIDP in the elderly (27-29). Thus, in the present pilot study, we primarily included elderly subjects.

As the subjects did not appear to have any trouble understanding the language of the questions or the options, we decided to use a Japanese translation that was as close as possible to the English original. No changes were made in the scoring or the order of the items. While conducting a pilot study, we included multiple-choice cards for the subjects and an explanatory document for the interviewers, together with instruments, as we felt that these were important for the study to proceed smoothly. Multiple-choice cards that contained the same content as the questionnaire were used to elicit an answer to each question.

A few items showed strongly skewed responses in the pilot study. We did not find specific reasons related to the subjects’ interpretations of the items. Most of our subjects were recruited from an urban area. Consequently, locality of residence might have affected the response patterns, although the sample size was not enough for confirmation

Table 1 Prevalence of oral health problems and oral impacts on daily performances

Performance	Having trouble because of problems with		Having impact on daily performances	
	mouth or teeth or removable dentures		because of these troubles	
	No	%	No	%
Eating food	13	27.7	12	25.5
Speaking	8	17.0	7	14.9
Cleaning teeth or dentures	6	12.8	3	6.4
Doing light physical activities	2	4.3	1	2.1
Going out	1	2.1	1	2.1
Sleeping	2	4.3	2	4.3
Relaxing	5	10.6	4	8.5
Smiling, laughing without embarrassment	8	17.0	5	10.6
Emotional state; becoming easily upset	9	19.1	9	19.1
Enjoying contact with people	2	4.3	2	4.3

Table 2 Item-scale correlations for the OIDP items

OIDP item	Eating food	Speaking	Cleaning teeth or dentures	Doing light physical activities	Going out	Sleeping	Relaxing	Smiling, laughing without embarrassment	Emotional state; becoming easily upset	Enjoying contact with people
Item-scale correlation	0.893	0.636	0.175	0.729	0.729	0.093	0.649	0.742	0.754	0.666

Cronbach's $\alpha = 0.772$

of the findings. A previous study using another language version of the OIDP has also reported skewed responses to some items (14). Analysis of the relationship between response patterns and subjects' characteristics could be important under various settings. The items 'teeth cleaning' and 'sleep' indicated lower corrected item-total correlations than the minimum recommended level of 0.20 (30). It may be that these items were conceptually different from the others and unlikely to become synchronized; however, further assessment should be performed to confirm this conclusion. Usually, internal consistency is considered to be sufficient when the alpha coefficient is greater than 0.7 (25), a condition that was met here. For the association between OIDP scores and the presence of removable prostheses, the hypothesis relating to construct validity was also met. The test-retest reliability was not evaluated in this study. Further assessment is needed, as well as a validation study with a larger sample.

We created a Japanese version of the OIDP scale following this analysis. A native English-speaking bilingual translator, who was not involved in the initial English-to-Japanese conversion, then translated the Japanese version back to the original language. The back translation was then approved by the original author. The author also provided comments regarding the wordings and interpretations of some items. For example, the back translation contained the phrase 'At what rate,' while in the original text, the phrase was 'How often.' This was changed to 'At what rate [frequency]' to follow the original more closely, although this constitutes a linguistic difference between Japanese and English.

We also considered the phrase 'find it difficult to attend to your oral care (brushing your teeth or taking care of your dentures)' in the reverse translation of 'cleaning teeth or dentures'. The interpretation given in parentheses was considered to be necessary because the item refers to oral hygiene and the words 'oral care' might cause misunderstanding. After discussion, this sentence was revised to 'find it difficult to clean your mouth (for example, brushing teeth)'. The final version was revised according to the original author's comments and then reconfirmed by the author.

The following three features are characteristic of the OIDP scale. First, the scale evaluates not only the existence and degree of oral health problems but also the extent to which such problems affect one's daily life. In our pilot study, we came across patients with oral health problems who did not think that these problems affected their daily life, which represented a new perspective on the evaluation of oral health-related QOL. Second, sleep and physical activity were included among the 10 items. As other oral

health-related QOL scales emphasize oral functions as targets for physical evaluation, this scale is potentially useful for assessing QOL evaluation of the impact of oral health on the activities of daily life, especially for fragile elderly subjects. The third characteristic of the OIDP scale is that it includes evaluations of the frequency and duration of oral discomfort. The GOHAI, for example, contains questions about the frequency of discomfort over the past 3 months, although cases may exist in which this greatly lowers the QOL score if the discomfort occurs only once and continues over a certain period of time. The OIDP has been carefully designed so that it can deal with both parameters (i.e., the frequency and duration of oral discomfort), and is useful for evaluating effects other than those that occur daily.

As for the previous studies that used the interview version of the OIDP, Sheiham et al. (28) conducted a study on a group of individuals who participated in the oral health component of the National Diet and Nutrition Survey, and compared these results with those of their dietary study. They found that the oral status frequently affected the QOL of older people and, in particular, their ability to eat common types of food. In another study, Tsakos et al. (29) showed a strong and consistent relationship between the OIDP scores and the number of occluding pairs of natural teeth in dentate subjects, and the presence of denture adaptation and retention problems in edentate subjects. These results demonstrate that oral health problems affect daily life, and we hope that similar studies using the National Survey data will be conducted in Japan in the near future.

With the original author's permission, the Japanese version of the OIDP for use in interview was completed. Further assessments and validations of this scale are needed in a study with a larger sample size.

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