ORIGINAL ARTICLE

Reliability, Validity, and Preference of an Original Faces Scale for Assessing the Mood of Patients with Dentures

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Clinical Significance

Since the ultimate aim of prosthetic treatment is to improve the patients' quality of life, patient-based assessment for evaluating therapeutic results is important. This study demonstrated that an original faces scale is an effective nonverbal method for conveniently assessing the mood of patients with dentures.

Abstract

Purpose: This study aims to examine the reliability, validity, and preference of an original faces scale (original FS) for mood assessment.
Methods: The original FS was evaluated by comparing it with a modified faces scale developed by Lorish and Maisiak (modified L&M FS) and the 100-mm visual analog scale (VAS) in mail survey mood assessments. The subjects were Japanese elderly patients with dentures (age range: 52-81 years; mean age: 68.8 years). We included 32 subjects for reliability and validity analyses, and 34 for analysis of scale preference. The test-retest reliability of the scales was determined by calculating the correlation between two assessments obtained at one-week intervals; the concurrent validity of the original FS, by calculating its correlation with VAS and the modified L&M FS. The scale preference was assessed by asking the subjects to determine which scale was easiest/most difficult to assess. The chi-square test was used to determine statistical differences between the three scales.
Results: All scales revealed a good test-retest reliability; further, the original FS demonstrated the highest Spearman's rank correlation coefficient (r=0.76). The concurrent validity, measured by the correlation between the original FS and VAS (r=0.70, P<0.01) and the modified L&M FS (r=0.90, P<0.01), was also established. A majority of the subjects preferred the original FS to the other scales.
Conclusion: The original FS is an effective nonverbal method for conveniently assessing the mood of patients with dentures with respect to prosthetic treatment.

Key words: faces scale, denture patients, mood assessment, prosthetic treatment

Introduction

Since the primary aim of any health care intervention is to improve the quality of life (QOL), the effect of any therapeutic intervention should be assessed not only objectively by health care professionals but also subjectively by patients. Inadequate dentures cause discomfort, such as pain and impaired oral functions, which may lead to the patient feeling depressed. However, the depressed mental state can be improved by adequate prosthetic treatment. Therefore, patient-based assessment—in which patients themselves rate therapeutic results—is important.

Several tools, such as the Self-rating Depression Scale (SDS),[1] the Profile of Mood States (POMS),[2] or the Beck Depression Inventory (BDI),[3] have been developed to assess mood. These have a high reliability and validity for measuring depressed mood states. However, they consist of several questionnaires and often require more than ten minutes to answer completely. Furthermore, they have limitations when being applied to people with low literacy. The visual analog scale (VAS) is a universally valid instrument for the assessment of mood. Since

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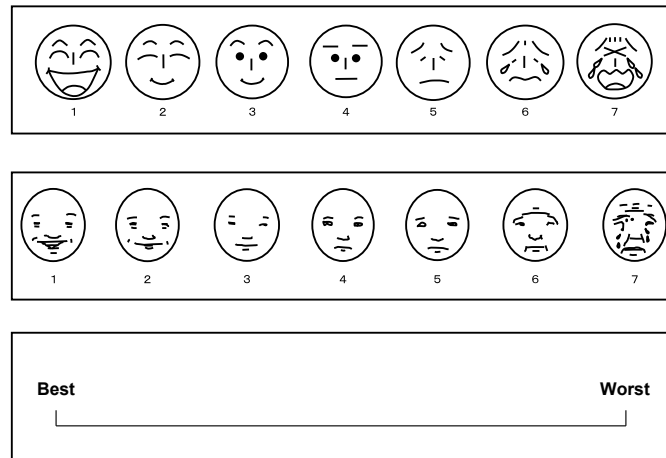
Fig. 1 The assessment scales. Top: Original faces scale, Middle: Modified faces scale developed by Lorish and Maisiak (Reprinted with permission from Wiley-Liss, Inc., a subsidiary of John Wiley & Sons, Inc.), Bottom: 100-mm visual analog scale.

Zeally and Aitken[4] reported a high validity for the scale in the assessment of mood, many studies have used it to measure mood changes in a variety of clinical conditions. Ahearn[5] showed that VAS possessed a high reliability and validity in mood assessment.

Lorish and Maisiak[6] developed a faces scale (FS) with illustrations of 20 faces to assess the mood of rheumatoid arthritis patients affected by pain. They found a statistically significant correlation between the FS scores and other standardized measurements of mood. By utilizing FS, we have previously assessed the mood of denture patients before and after treatment and reported that the FS was effective in assessing the patients' moods by indicating the improvement in mood after prosthetic treatment.[7-9] However, some patients selected two adjacent drawings simultaneously, which may indicate a difficulty in selection owing to small, relatively indistinguishable differences between the adjacent drawings on the Lorish and Maisiak FS (L&M FS). Furthermore, some patients opined that the facial expressions of the illustrations of the L&M FS were not familiar to them. In order to overcome these problems, we developed an original FS with seven familiar faces for elderly Japanese patients.

Thus, the aim of this study was to examine the reliability, validity, and preference of this original FS for assessing the mood of patients with dentures.

Materials and methods

Subjects

The subjects were 36 patients (13 men and 23 women) who were fitted with removable dentures at Kagoshima University Medical and Dental Hospital and demonstrated successful therapeutic results in follow-up examinations. No dental treatment was performed in the experimental period. The study was explained to the subjects and their informed consent was obtained. Four subjects from the initial 36 were not included in the reliability and validity tests since mood assessment was not undertaken for these patients. Therefore, 32 subjects (11 men and 21 women) with their ages ranging between 52 to 81 years (mean age: 68.8 years) were included in the reliability and validity analyses. Further, of the 36 patients, two subjects were not included in the preference analysis; thus, the 34 subjects (12 men and 22 women) with their ages ranging between 52 to 81 years (mean age: 68.8 years) were included in the analysis of scale preference.

Scales

Three self-rated measures of mood were evaluated in this study (Fig. 1). One was the original FS developed by us, the second was the L&M FS modified by us comprising of seven faces (modified L&M FS), and the third was the 100-mm VAS. Both the FSs consisted of seven drawings of single faces numbered in the order of mood, from a very happy, smiling face to a sad, tearful face. The faces of the original FS were arranged for
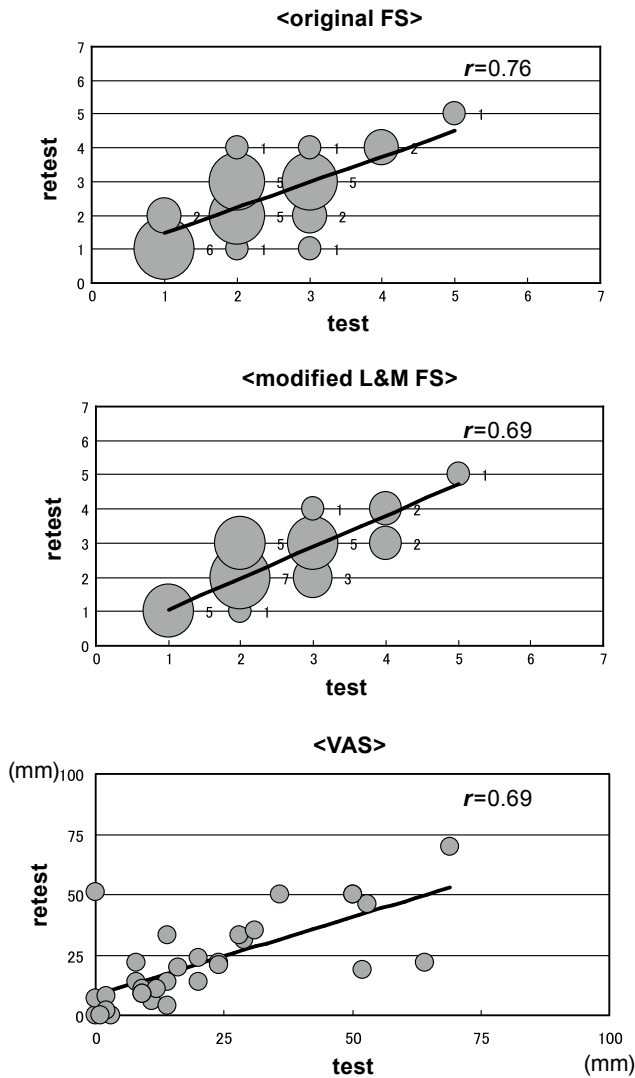
Fig. 2 The association between the two assessments for each self-rated scale. The diameter of the circle represents the number of the subjects.

ease in distinguishing differences between the adjacent faces. The modified L&M FS was composed of seven faces that were selected from the original 20 faces for comparison with the original FS. In VAS, which is generally recognized as a valid measure for pain and other symptoms, the left side represents the best mood and the right side represents the worst mood.

Procedure

Mood assessment was undertaken twice, with a one-week interval, in order to evaluate the test-retest reliability. At the first assessment, the scales were explained to the subjects. They were asked to select the numeral under the face illustration on the FSs and to mark a point on the

line on VAS that reflected their mood best with respect to their oral conditions. Further, after returning home, they assessed their mood and returned their scores via mail. The second assessment was sent via mail and questionnaires for preference were included in this assessment. The subjects were asked the following questions: (1) "Which scale is the easiest to assess?" (2) "Which scale is the most difficult to assess?" and (3) "Why did you choose the respective scales?"

Data analysis

The test-retest reliability of the three scales was determined by calculating the correlation between the scores of the two assessments using Spearman's rank correlation coefficient. The concurrent validity of the original FS was evaluated by correlating the scores for the original FS and the respective scores for the other two scales by summing the results and using Spearman's rank correlation coefficient. The scale preference was assessed by asking the subjects to determine which scale was the easiest/most difficult to assess. The chi-square test was used to determine the difference in preference between the three scales. All statistical analyses were performed using SPSS 14.0J for Windows (SPSS Japan Inc., Tokyo, Japan).

Results

Reliability

Figure 2 shows the relationship between the two assessments using each self-rated scale. The diameter of the circle represents the number of the subjects. For each of the three scales, the first assessment had statistically significant positive correlations with the second assessment ($P<0.01$). The Spearman's rank correlation coefficient for each scale ranged from 0.69 to 0.76; further, the original FS demonstrated the strongest correlation ($r=0.76$) among the three scales.

Validity

The correlations between the three scales are shown in Table 1. The original FS had a statistically significant positive correlation with each of the other scales ($P<0.01$). The Spearman's rank correlation coefficient between the original FS and VAS/modified L&M FS revealed a high correlation ($r=0.70/0.90$).

Table 1 Correlation between the three scales.

scales	original	L&M	VAS
original	—		
L&M	0.90	—	
VAS	0.70	0.68	—

All correlations significant $P<0.01$
original: original faces scale
L&M: modified Lorish & Maisiak faces scale
VAS: 100 mm visual analog scale

Table 2 Number of subjects who preferred each scale.

scales	original	L&M	VAS	no reply
easiest	21(61.8%)	4 (11.8%)	8 (23.5%)	1 (2.9%)
most difficult	5 (14.7%)	10 (29.4%)	17 (50.0%)	2 (5.9%)

original: original faces scale
L&M: modified Lorish & Maisiak faces scale
VAS: 100 mm visual analog scale

Preference

Table 2 shows the number and percentage of subjects who chose each scale as the easiest or the most difficult scale for mood assessment. The majority of the patients (61.8%) rated the original FS as the easiest; only 11.8% of the patients rated the L&M FS as the easiest. On the other hand, 50% of the patients rated VAS as the most difficult to use among all the scales, and only 14.7% rated the original FS as the most difficult to use. The statistic analysis revealed significant differences between the three scales (χ^2=15.6, $P<0.01$).

The most common reason for selecting the easiest scale was that the scale was "simple or familiar", while those for the most difficult scale indicated that the scale was "difficult to understand" and they were "perplexed to decide the point to mark".

Discussion

Background

In pain assessment, there are various self-rated scales, such as VAS, the faces pain scale (FPS), numeric rating scales (NRS), the verbal descriptor scale (VDS), simple descriptive scales, the color analog scale (CAS), the chips scale, and the glasses scale, and the color scale.

The FPS is a simple self-rating method and has been applied to children as it does not require verbal competence.[10,11] Studies have shown that FPS has a good reliability and validity for use in pediatrics.[10-14] Wong and Baker[10] compared the preference, validity, and reliability of various pain-assessment scales for children, including simple descriptive scales, NRS, FPS, the glasses scale, the chips scale, and the color scale. Their results indicated that the FS was clearly preferred over the other scales; however, all scales had similar validity and reliability.

In addition, some studies have reported a good reliability and validity of FPS for elderly people.[15-19] Taylor and Herr[17] determined the reliability and validity of selected pain-intensity scales such as the FPS, the VDS, the NRS, and the modified VDS. The results revealed that the Spearman's rank correlation coefficients ranged from 0.73 to 0.83 in the test-retest reliability at a 2-week interval and from 0.74 to 0.96 in concurrent validity.

In mood assessment, Lorish and Maisiak[6] assessed the test-retest reliability of their FS over a 45-minute interval along with the correlation between their FS and other measurements of mood (BDI and others). Their report demonstrated a statistically significant correlation (r=0.81) for the test-retest scores of their FS on two administrations and also between their FS and BDI (r=0.49) and the others. We have reported that their scale is useful for quantifying the mood of denture wearers;[9] this indicated that inadequate dentures depress the mood of patients, which is worsened by pain. However, it appeared that elderly Japanese patients did not appreciate the facial expressions in the illustrations; further, 20 sets of illustrations caused indecision while choosing between two adjacent drawings. There are several versions of the FS with five,[12] six,[10] seven,[11] eleven,[19] and twenty[6] faces. We developed an original FS with seven illustrations of facial expressions.

Reliability

The results of the reliability test demonstrate a higher test-retest reliability of the original FS than VAS and modified L&M FS, which were reported to have a good reliability in previous reports.[5,6] This indicates that the assessment using the original FS is adequately reproducible over time; therefore, the original FS has sufficient reliability for the clinical assessment of mood in patients wearing dentures.

Validity

The validity of the original FS was evaluated by obtaining correlations between the original FS and VAS/L&M FS, which were reported to have a good validity in previous studies.[5,6] Our findings demonstrate that the original FS has a sufficient concurrent validity for mood assessment.

Preference

The results of the preference test indicated that the elderly subjects preferred the original FS to the other scales.

Many studies have indicated that FS was preferred over other scales in children[10,13,14,20,21] and in elderly individuals.[16-18] Some researchers have reported that the FSs have advantages with respect to measuring the chronic pain intensity in older adults.[15,18,19,22]

VAS, which is a universally used valid instrument for the assessment of a variety of clinical outcomes, has the disadvantage of requiring verbal instructions. It has been suggested that deficits in abstract ability that are present in the elderly may cause them difficulties in using VAS.[22-24] Some researchers have noted that increased age is associated with a greater frequency of incorrect responses in VAS.[23,25] In this study, VAS was evaluated as difficult to understand and to answer by the elderly Japanese subjects. This indicates that the original FS was preferred to VAS by these subjects.

This preference indicated that the faces illustrated in the original FS are simple and familiar to elderly people. The facial expressions in the illustrations of the L&M FS are not preferred by elderly Japanese patients. Thus, the original FS is more advantageous with a low frequency of incorrect responses.

Relationship with oral health-related QOL

The mood of a patient is related to his/her QOL; Tabira et al[26] reported that the FS scores of were correlated with the total QOL score following esophagectomy; further, it could be useful as a global parameter for QOL. In this study, we asked the subjects to select the number corresponding to the facial expression that matched their mood while thinking about their oral condition. The FS score in this study could, therefore, be correlated to oral health-related QOL. Further research is required to examine this potential association.

Conclusion

This study examined the usefulness of the original FS for assessing the mood of patients with dentures. The results of this study indicated that the original FS had sufficient reliability and validity for clinical use in elderly patients with dentures and that the original FS was preferred by elderly patients over the other scales. The original FS is a valid and reliable instrument to assess the mood of patients with dentures with respect to prosthetic treatment.

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