

Oral health related quality of life among imprisoned Dutch forensic psychiatric patients

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Abstract

Because dental health and oral pathology may affect forensic psychiatric patients' well being, it is important to be able to assess oral health related quality of life (OH-QoL) in these patients. Two studies were conducted among Dutch forensic psychiatric male patients to assess the psychometric properties and some potential predictors of the Oral Health Impact Profile-14 (OHIP-14) as a measure of OH-QoL. Study 1 involved 40 patients who completed the OHIP-14 before receiving professional dental care and were retested 3 months later. The internal consistency was good, the test-retest correlations were fair, and over the 3 months follow-up no significant changes in OH-QoL were observed. Study 2 consisted of 39 patients who completed an improved version of the original OHIP-14, as well as measures to validate of the OHIP. Dental anxiety and unhealthy dentition jointly explained 26.7% of the variance in OH-QoL, and the better patients performed their oral hygiene behavior, the better their OH-QoL. It is concluded that the Dutch OHIP-14 is a useful instrument, and that nurses, especially in forensic nursing, should pay particularly attention to dental anxiety when encouraging patients to visit OH professionals and to perform adequate oral hygiene self-care.

Introduction

The practice of good oral hygiene behavior (OHB) is assumed to be conducted properly; the prevalence of oral disease suggests that this behavior is not always being performed efficiently. The theoretical model of oral health (OH) (Locker, 1988) suggests that oral disease can lead to impairments in several dimensions, such as the physical, the psychological, and the social spheres. Impairments are described by Locker as any limitation in or lack of ability to perform activities of daily living (Slade & Spencer, 1994) that can lead to a decrease in quality of life (QoL). The short form of the OH Impact Profile (OHIP) is a self-reporting instrument aimed at measuring the negative social, psychological, and physical consequences of OH problems: the more frequent the prob-

lems, the lower the QoL (Slade, 1997). The short form of the OHIP-14 is used worldwide, and there is a certain amount of evidence for its validity and reliability (Fernandes, Ruta, Ogden, Pitts, & Ogsten, 2006; Oliveira & Nadanovsky, 2005).

A number of studies have shown that OH and diseases can have negative consequences for OH-QoL (John & Micheelis, 2003; Locker, 2004), and their social impact tends to be more frequent in specific patient groups, namely the elderly and the prison population when compared to the general population (Boyer, Nielsen-Thompson, & Hill, 2002; Heidari, Dickinson, Wilson, & Fiske, 2007; Mixson, Elpee, Fell, Jones, & Rico, 1990; Slade & Spencer, 1994; Wong, Lo, & McMillan, 2002). Only one study has reported on the prevalence of oral disease and its impact on the QoL of an older

prison population in Hong Kong, China (McGrath, 2002). However, there has been no research examining OH and its self-reported impact on QoL in Dutch prison populations.

In the Netherlands, individuals with mental disorders who have also committed serious offenses are imprisoned and treated in special institutions. This highly select population consists of patients who have been convicted of severe criminal acts. After more than 4 years in prison, these patients are transferred to a forensic psychiatric institution. To reduce recidivism, they receive forced treatment in line with their psychiatric needs. The Dr. S. van Mesdag Forensic Psychiatric Centre is one of these institutions, and the heterogeneous group of diverse mental patients within this center can be divided into patients with psychotic vulnerability and patients with personality disorders; classified by DSM-IV-TR (First, Frances, & Pincus, 2004).

The purpose of this study was to examine whether an existing measurement for OH-QoL could be administered in a valid and reliable way to this group. The present research was conducted among imprisoned Dutch forensic psychiatric patients. This study consisted of two studies. Study 1 was to test the psychometric properties of the Dutch version of the OHIP-14. Study 2 focused on the construct validity of the OHIP-14-NL and on increasing our knowledge on possible determinants and effects of OH-QoL in forensic patients.

Study 1

Method

Participants

The final sample consisted of 40 institutionalized male forensic psychiatric patients, with a mean age of 33.70 (SD = 6.40) (ranging from 23 to 49 years). The sample included patients with psychotic vulnerability (40%) and patients with personality disorders (60%). For various reasons (e.g., movement to another center or refusal to receive further dental treatment), only 36 of 40 patients returned to the dental hygienist after 3 months in order to fill out the OHIP-14 again.

Procedure

Over a period of 7 months (December 2002–July 2003), 49 male forensic psychiatric patients from the Dr. S. van Mesdag Forensic Psychiatric Centre in Groningen were asked if they were willing to participate in the study on a voluntary basis. Ethical approval for this study was obtained from the ethics committee of the institution, and the administration of the OHIP-14-NL was linked to a

dental screening in the clinic. This screening was conducted by a dentist and involved an evaluation of the patient's OH care, gauging their motivation to engage in OH care, the level of bleeding on probing (BOP), and the need for dental treatment. At the end of the screening, the participants filled out a Dutch version of the short form of the OHIP (OHIP-14; first measurement). Subsequently, all patients received information about and instruction (skills training) concerning OH and received a professional dental clean, which was carried out by a dental hygienist (the first author). Three months after the first OHIP-14 measurement, patients filled out the retest questionnaire (retest measurement). Patients who needed additional dental care between the two measurements received those dental treatments from the dentist during the 3-month interval.

Measurement

The OHIP-14 questionnaire is a short-form version of the original 49-item OHIP and is thought to assess OH-related QoL. The original English version of the OHIP-14 was translated into Dutch using the forward-translation technique. This slightly adapted version of the OHIP-14 consists of 14 items organized in seven dimensions (two items for every dimension, but the original order is shuffled): function limitation (Q4, Q14), physical pain (Q2, Q5), psychological discomfort (Q1, Q9), physical disability (Q12, Q10), psychological disability (Q13, Q8), social disability (Q7, Q3), and handicap (Q11, Q6). Responses were scored on a five-point Likert scale ranging from 0 = "never" to 4 = "very often." Sum scores ranged from 0 to 56, and a high score represents a low OH-QoL (Appendix I).

Statistical testing

The level of statistical significance was set at <0.05 . The present sample size is sufficient to detect at least moderate effect sizes (e.g., r 's > 0.30) at this level (Cohen, 1988). We tested unweighted and weighted item scores to compose the OHIP scale (Slade, 1997).

Results

In general, the prevalence of oral disease in the sample was high and most of the patients who participated in this study had bad teeth. In the clinical examination, a high level of decay, severe periodontal diseases, and missing and filled teeth were observed. OH and oral self-care were generally low.

Little difference was found between unweighted and weighted item scores. Therefore, we only present the

results using unweighted scores. One of the 14 items (“Have you been totally unable to function because of problems with your teeth, mouth, or dentures?”) was removed because of a negative item-total correlation. This resulted in increasing the Cronbach’s alpha of the OHIP scale from 0.78 to 0.87. Thus, the Cronbach’s alpha of this 13-item OHIP scale at the first measurement was good ($\alpha = 0.87$), and the item-scale correlations varied from 0.19 to 0.72. At baseline, the mean OHIP summary score was 10.93 (SD = 7.09; range 0–30).

At retest, Cronbach’s alpha for OHIP scale was 0.81, which also indicates good internal consistency. Furthermore, at retest, the item-scale correlations ranged from 0.18 to 0.71. At follow-up, the mean OHIP summary score was 10.06 (SD = 5.78; range 1–25). Thus, patients evaluated their OH-related QoL rather positively at baseline, as well as after 3 months.

Paired *t*-tests were used to check whether during the 3-month interval between the first and the retest measurements the OHIP scores had significantly changed. However, neither the overall OHIP scores nor the dimension scores differed significantly between either measurements.

Table 1 shows the correlations with the total scale and the test–retest correlation for the six dimensions separately as well as for the single question, “Have you felt that life in general was less satisfying because of problems with your teeth, mouth, or dentures?” from the “handicap” dimension. The test–retest correlation for the OHIP summary score was 0.56 ($p < 0.01$), which could be qualified as low to fairly reliable. Test–retest correlations for three of the seven OHIP dimensions were below 0.45, while the other four were around 0.60. These results showed small fluctuations between poor to fair reliability on the dimension level.

Table 1 Item-correlations at T1 and T2 and test–retest correlation of the OHIP

OHIP dimensions	Correlations		
	With total scale T1	With total scale T2	Test–retest
Function limitation	0.56	0.59	0.27
Physical pain	0.50	0.54	0.61**
Psychological discomfort	0.54	0.43	0.41*
Physical disability	0.76	0.34	0.34*
Psychological disability	0.84	0.76	0.63**
Social disability	0.83	0.73	0.69**
Handicap [#]	0.45	0.64	0.57**
Total scale			0.56**

* $p < .05$, ** $p < .001$.

[#]This dimension consists of only one item.

Study 2

Method

Participants

In study 2, 39 male forensic psychiatric patients were selected. Their mean age was 37.9 (SD = 9.6) years. Once more, ethical approval for this second study (March–June 2006) was obtained from the ethics committee of the institution.

Procedure

The OHIP-14 measure was further improved. The forward-backward-translation technique was used, followed by the application of the Delphi-method in order to assess the face and content validity of the preliminary translation of the short-form OHIP used in Study 1 and the original English version of the OHIP-14. Three years after Study 1, all departments in the center (180 patients in total) were visited by the first author (the dental hygienist) over a period of 2 months in order to inform patients about this study of oral self-care behavior. At the end of the consultation, a questionnaire was handed out and the participants were invited to voluntarily fill out the questionnaire, which contained the improved, linguistically validated OHIP-14-NL mentioned in Appendix I.

Measures

The questionnaire included a few demographic questions such as age, nationality, education, and marital status and the following construct measurements.

OH-related QoL was measured by the improved Dutch OHIP-14, including the item “Have you been totally unable to function because of problems with your teeth, mouth, or dentures?” (14 items, Cronbach’s $\alpha = 0.91$).

OHB was measured by using an index for OHB developed by Buunk-Werkhoven, Dijkstra, & van der Schans, 2009a). The index includes eight items with respect to tooth brushing, interdental cleaning, and tongue cleaning. For example, the item “I brush my teeth as follows” was supported by pictures showing different brushing methods such as horizontal, vertical, circular, and the Bass-method. After the item scores were assigned weights, the index values were calculated and a sum score was computed. The OHB sum score on this index could range from 0 to 16. A high sum score indicated a high level of optimal self-care OHB.

Expected social outcomes (ESOs; Buunk-Werkhoven et al., 2008; Buunk-Werkhoven et al., 2009a; Buunk-Werkhoven, Dijkstra, van der Wal et al., 2009) for having

healthy teeth were assessed with a scale of six items ($\alpha = 0.83$). An example of an item is "In social contacts fresh breath is important." Responses varied from 1 = disagree to 5 = agree, and a sum score was computed by summing up scores on all six items that measured the concept ESO (ranging from 6 to 30).

Dental anxiety was measured by asking questions of the dental anxiety scale (DAS; Corah, Gale, & Illig, 1978). This is a four-item self-reporting scale measuring the anxiety about dental appointments (Cronbach's $\alpha = 0.90$). Items were scored on a scale of 1–5, and summed to provide an overall DAS ranging from 4 ("not anxious at all") to 20 ("extremely anxious"). Scores of 15 and above are generally considered as extremely anxious.

Clinical dentition characteristics

If a record of dentition characteristics (healthy dentition, slightly unhealthy dentition, mutilated dentition) was available in a patient's dental dossier, the patient's dentition characteristic was also registered.

Results

The 39 participants evaluated their perceived OH-QoL within a possible range from 0 to 56. About 85% of the patients ranked their perceived OH-QoL extremely positively, with a mean score of 9.31 (SD = 8.71). They reported few if any limitations because of problems with their teeth, mouth, or dentures. Furthermore, the patients had a mean DAS score of 7.61 (SD = 3.26), which is considered to be indicative of no dental anxiety (Corah et al., 1978). The patients attached a high value to the positive social outcomes of having healthy teeth ($M = 23.92$, $SD = 5.18$), and they felt that they had considerable control over carrying out oral self-care practices ($M = 10.61$, $SD = 2.32$). For instance, the reported results of the OHB index showed that almost two-thirds of the respondents brushed their teeth as recommended by professionals, 2 minutes twice a day and used toothpaste with fluoride. In addition, 50% of the patients also used interdental cleaning aids and cleaned their tongue.

In addition, correlational analyses were carried out to evaluate the construct validity of the OHIP-14 and to establish the direction and magnitude of the associations between the variables (see Table 2). In this sample of 39 forensic psychiatric patients, perceived OH-QoL was found to correlate positively and significantly with dental anxiety: the more anxiety patients reported, the lower their OH-QoL. In a sub-sample of patients whose

Table 2 Intercorrelations between the main variables

Variables	1	2	3	4	5
1. The Dutch OHIP-14 ^a	–				
2. Expected social outcomes (ESOs) ^b	0.14	–			
3. Dental anxiety (DAS) ^c	0.44**	–0.08	–		
4. Oral health behavior (OHB) ^d	–0.39*	0.21	–0.36*	–	
5. Dentition characteristics ^e	0.54*	0.17	0.10	–0.11	–

Note. ^a $n = 39$, ^b $n = 37$, ^c $n = 38$, ^d $n = 31$, ^e $n = 20$.

* $p < 0.05$, ** $p < 0.001$.

dentition characteristics were known ($n = 20$), dental pathology correlated positively and significantly with OH-QoL: the worse their dental health, the lower their OH-QoL was. Furthermore, OH-QoL was found to correlate negatively and significantly with OHB: the better patients took care of their OH, the better their OH-QoL was. Social outcomes were not related significantly to OH-QoL.

Finally, linear regression analysis was performed to examine the multivariate relationships of the variables with OH-QoL. The three variables that had significant univariate relations with OH-QoL were entered at once. This model proved to be significant, $F(3,36) = 5.73$, $p < 0.001$, and accounted for 26.7% of the variance in OH-QoL, which is a substantial proportion. Only dental pathology ($\beta = 0.35$, $p < 0.05$) and dental anxiety ($\beta = 0.29$, $p < 0.05$) emerged as significant predictors of OH-QoL. Interestingly, in these multivariate analyses, OHB was no longer associated with OH-QoL.

Discussion

The psychometric qualities of the Dutch version of the OHIP-14, as well as the determinants of the OHIP-14, were assessed in two groups of forensic psychiatric patients.

Based on the first study, the following conclusions can be drawn. First, the version of the OHIP (albeit with 13 items) had a good internal consistency as is apparent from a high coefficient alpha for the total scale. This is especially noteworthy given the relatively small number of items and the substantial variety in the content of the items. Second, the stability of the OHIP was satisfactory as is apparent from the test–retest reliability, although this was not true for all dimensions. It may be that some dimensions change more easily and so a shorter test–retest interval would be recommended for any future administration of the OHIP. Third, the performance of the unweighted 13-item OHIP was as good as that of

the weighted version. This is in line with the findings of Allen and Locker (1997). Thus, there was no reason to use the weighted version. Moreover, in a study by Allison, Locker, and Feine (1997), the OHIP exhibits a reasonable degree of cross-cultural consistency, and it has been shown in other studies that the reliability and validity of the short-form OHIP is comparable to the long-form OHIP (Allen & Locker, 1997; John et al., 2006; Van der Meulen, John, Naeije, & Lobbezoo, 2008; Slade, 1997; Wong et al., 2002). Fourth, rather low scores were reported on OHIP scale, suggesting a rather good OH-QoL. It may be that these psychiatric patients disclaimed their own OH because of other overwhelming problems or because their expectations of OH were generally low.

Study 2 was designed to estimate the determinants of OH-QoL, because such knowledge may increase our insight into the psychology of OH-QoL and might be utilized to improve the OH-QoL. In line with a study of Buunk-Werkhoven, Dijkstra, and van der Schans (2009b), OH-QoL was assessed together with formal measurements of self-reported social outcomes of OH (the perceived importance of healthy teeth for social functioning), OHB, dental anxiety (fear for dental treatment), and patient's clinical dentition characteristics (level of OH/oral pathology), and concluded the following. First, underlining the construct validity of the OHIP-14, it correlated with the variables of dental anxiety, dentition characteristics (pathology), and OH behavior, but not with the variable of ESOs: the more fear participants had for dental treatment, the worse they took care of their teeth, and the more dental pathology they had, the lower their OH-QoL was. Dental anxiety is thought to be an important negative determinant of OH-QoL (Mehrezedt, John, Tönnies, & Micheelis, 2007; Vermaire, de Jongh, & Aartman, 2008). Second, regression analysis indicated that dental anxiety was the best predictor of the OHIP-14 and explained, together with dentition characteristics, 26.7% of the variance in self-reported OH-QoL.

One limitation of the present studies was the small sample sizes. It was small because the imprisoned forensic population is not easy to approach due to all kinds of restrictions and security measures. However, the sample size did have sufficient power to detect moderate effects at the 5% level of significance (Cohen, 1988). Furthermore, although the samples may be small, they can be regarded as representative for the Dutch imprisoned forensic population. In addition, despite the small sample size, study 2 revealed significant relationships among the variables. This means that the significant effects must be relatively large and, therefore, may have more practical meaning.

Forensic nursing implications

The knowledge gathered in the present studies may contribute to the practice of forensic nursing in several ways. One premise is that in no matter what field nursing is applied, it always takes into account the interplay of physical, social, and psychological factors. One task in forensic nursing is to monitor patients' psychological and psychiatric state for diagnostic reasons or for early detection and, subsequent, adequate treatment (Dashiff, 1988). Within this task, one important aspect to focus on is the subjective experience of the patient; "How does he feel?" The present studies suggest that one possible cause of feeling bad might be low OH-QoL. Thus, certainly in the case of dental pathology, the patients' psychological state (e.g., mood, negative emotions, and well being) may be influenced by his dental health. For the right diagnosis and applying the right treatment, it is important to acknowledge this.

A core aspect of nursing and, thus, also of forensic nursing is to support patients' self-care (Denyes, Orem, & Bekel, 2001). First, OH care is a form of universal self-care and in nursing this self-care can be supported by providing information on why and how to practice (preventive) OH care (Buunk-Werkhoven, Dijkstra-le Clercq, de Jong, & Spreen, 2009). Second, in the case of dental pathology, the patient should adapt his behavior to this situation, for example, by complying with a prescribed treatment. This is called health deviation self-care, and this kind of self-care also needs nursing support. Thus, in forensic nursing, oral care, oral pathology, and OH-QoL are relevant because, from a holistic perspective, they do influence patients' biological, psychological, and social functioning.

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Appendix I

Slightly adapted version of the Oral Health Impact Profile-14.

This questionnaire contains questions regarding the condition of your teeth in the past 4 weeks. To answer each question put a circle around one of the following possible answers:

	0	1	2	3	4
Q1. Have you been self-conscious because of your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q2. Have you had painful aching in your mouth?	Never	Sometimes	Regularly	Often	Very often
Q3. Have you had difficulty doing your usual jobs because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q4. Have you had trouble pronouncing any words because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q5. Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q6. Have you been totally unable to function because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q7. Have you been a bit irritable with other people because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q8. Have you been a bit embarrassed because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q9. Have you felt tense because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q10. Have you had to interrupt meals because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q11. Have you felt that life in general was less satisfying because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q12. Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?	Never	Sometimes	Regularly	Often	Very often
Q13. Have you found it difficult to relax because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often
Q14. Have you felt that your sense of taste has worsened because of problems with your teeth, mouth, or dentures?	Never	Sometimes	Regularly	Often	Very often

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