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ORIGINAL ARTICLE

Dimensional structure of the OHIP-14 and associations with self-report oral health-related variables in home-dwelling Norwegians aged 70+

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ABSTRACT

Objectives: The primary objective of the present study was to investigate the dimensional structure of the OHIP-14 in a sample of elderly Norwegians. A secondary objective was to describe associations between the exposed OHIP-14 dimensions and additional self-report oral health-related variables to assess the dimensions' criterion validity.

Materials and methods: A survey questionnaire including the OHIP-14 and additional self-report oral health-related measures was completed by 325 home-dwelling Norwegians aged 70+. Exploratory factor analysis was used to investigate the dimensional structure of the OHIP-14 in this sample. Bivariate correlations were used to describe associations between the exposed OHIP-14 dimensions and additional self-report oral health-related variables.

Results: Three dimensions named *psychosocial impacts, oral function impacts* and *general function impacts* were revealed. Convergent and discriminant validity of these dimensions were largely supported, and internal consistency reliability for each dimension was good. Statistically significant associations were found between the exposed dimensions and additional self-report oral health-related variables, supporting the dimensions' criterion validity.

Conclusions: A three-dimensional structure of the OHIP-14 was exposed and validated in the present study sample. Since different aspects of oral health-related quality of life (OHRQoL) may be perceived and weighted differently in various populations, suggestions for future research include more profound investigations of the construct validity of the OHIP-14 and similar instruments assessing OHRQoL. Such research should include an exploration of various dimensions and the weights given to them through qualitative research in the target population(s).

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Introduction

Quality of life (QoL) is recognized as a valid parameter in patient assessment in most areas of physical and mental healthcare, including oral health [1]. According to the World Health Organization (WHO), QoL can be defined as individuals' perceptions of their position in life in the context of culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns [2]. As for general QoL constructs, oral health-related QoL (OHRQoL) is often employed as a proxy of health or as a complementary addition to normative clinical outcomes [1].

OHRQoL is a multidimensional construct that aims to capture several aspects of QoL related to oral health and disease. Among the many instruments developed to measure OHRQoL is the Oral Health Impact Profile (OHIP), which aims to provide a comprehensive measure of self-reported dysfunction, discomfort and disability attributed to oral conditions [3]. The original OHIP is comprised of 49 items grouped in seven dimensions based on Locker's [4] model of oral health, which conceptualizes the effects of oral health to individuals' everyday ability to speak, chew, taste food, socialize and enjoy life – with potential repercussions to physical, psychological and social wellbeing. The seven dimensions are named *functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability* and *handicap*. The OHIP-14 [5] was developed as a shorter version of the OHIP-49 and is the most commonly used instrument for assessing adverse impacts caused by oral conditions on wellbeing and QoL [5,6]. Other short forms of the OHIP scale have also been developed, some of them generic, others condition specific [7–11]. The OHIP in either its long, short, generic or condition specific versions has been translated and validated in more than 36 languages and cultural contexts [12], and the instrument has proven to be an important resource for examining oral health impacts on daily life activities [13].

Despite the widespread testing and use of the OHIP scales and similar measures, it has been questioned if the conceptual and methodological issues involved in measuring various populations' perceptions of OHRQoL have been satisfactorily addressed and/or solved [6,13,14]. When it comes to the OHIP-49, its items do not seem to represent seven separate dimensions as originally devised [15,16]. For example, in a study using expert opinions to assign items to dimensions, five dimensions were enough to group all items [17]. This

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finding has been supported by later factor analytic studies, of which most present between three and six latent factors [16]. Also factor analysis on the OHIP-14 varies in number and interpretation of factors, and thus, shares many similarities with the findings for the OHIP-49. For example, Montero et al. [18] revealed a three-factor structure in a sample of healthy Spanish workers, while Balci et al. [19] reproduced a seven-factor structure as originally devised for the tool in Turkish adults ≥25 years. Other studies indicate the presence of several latent factors together with one higher order dominant factor [20,21]. Andiappan [22] tested several factor models using structural equation modelling (SEM) with inconclusive results as none of the models fitted the data well, supporting the rationale for further research on the dimensional structure of the OHIP-14. Finally, John et al. [23] argue that a particular four-factor structure is the most psychometrically sound and clinically plausible characterization of OHRQoL regardless of which version of the OHIP is used.

Acceptable construct validity is a requirement for measurement scales to be considered adequate or useful. Construct validity may be defined as the extent to which the measurements used, often questionnaire items, actually reflect the theoretical constructs they are supposed to measure [24]. In other words, item correlations that fit the expected pattern of a construct's dimensional structure contribute to evidence of construct validity. The diverse number of dimensions resulting from factor analytic studies on the OHIP scales illustrates the challenge of proving construct validity once and for all. Rather it is a continuous process of evaluation, re-evaluation, refinement and development [25]. According to a recent review by Riva et al. [6], which included 392 studies on OHRQoL instruments, their theoretical background, validation and cross-cultural adaptation, few instruments have gone through rigorous internal validation processes and cross-cultural adaptation. This makes it challenging for researchers to choose an appropriate instrument based on known psychometric properties. Thus, further analyses on the dimensionality, the composition of dimensions, and thereby the construct validity of existing OHRQoL instruments, seems warranted – especially before application in novel contexts. Such analyses may help improve interpretation of results obtained with these instruments in various settings. Although the OHIP-14 has been translated to Norwegian and applied in Norwegian studies on older adults [26], its dimensionality has not yet been investigated in a Norwegian setting. Thus, the primary objective of the present work was to investigate the dimensional structure of the OHIP-14 in a sample of elderly Norwegians. A secondary objective was to describe associations between the exposed OHIP-14 dimensions and additional self-report oral health-related variables to assess the dimensions' criterion validity.

Materials and methods

Participants and procedures

The present study is an initial part of the Self-management, Oral health and Nutrition in Elderly Citizens (SONEC) project, which aims to assess relationships between perceived self-care abilities, oral health and nutritional status in home-dwelling elderly. The project is approved by the Norwegian Regional Committee for Medical and Health Research Ethics (REK 2020/30296) and the Norwegian Social Sciences Data Services (NSD).

A postal survey questionnaire including measures assessing perceived oral and general health, nutritional status and self-care ability was distributed to a random sample of 1000 members of the Norwegian Pensioners' Association.[1] Inclusion criteria were being ≥70 years old, living at home and being able to give information about personal situation. Exclusion criteria were living in nursing homes or staying at hospitals. Strategies to enhance response rate included information about the aim and relevance of the study, reassurance that respondent privacy would be protected and an invitation to take part in a lottery with the possibility of winning a food and grocery gift card worth 1000 NOKs. Due to limited time and monetary resources, and lack of direct access to participants in this part of the project (names and contact information were highly protected and only accessible to certified people at the Norwegian Pensioners' Association), sending reminders was not an option. Written informed consent was obtained from all participants and data were de-identified prior to statistical analyses.

Questionnaire

A draft questionnaire, which was based on scales and items from previous research, was developed and pretested in two steps. The first step involved discussions with dental researchers and health personnel employed in healthcare services for older adults. The second step involved discussions with representatives from the target group. Issues regarding layout, alternative wordings/ways of asking questions and time spent on the survey were discussed and revisions were made based on feedback from both steps of the pretest. The final, overall questionnaire used in the SONEC project included a Norwegian version of the OHIP-14 [26], single-item measures assessing self-report oral- and general health related variables, the nutritional form for the elderly (NUFFE) [27], the self-care ability scale for the elderly (SASE) [28] and sociodemographic variables. The measures applied in the present study are further described below.

The OHIP-14

In the OHIP-14, each of seven aspects of OHRQoL is assumed to be represented by two items as suggested by Slade and Spencer [3]: functional limitation (had difficulties pronouncing words or sounds, felt sense of taste changed/worsened), physical pain (had painful aching in mouth or teeth, felt uncomfortable to eat foods), psychological discomfort (felt self-conscious or insecure, felt tense or stressed), physical disability (had an unsatisfactory diet, had to interrupt meals), psychological disability (had difficulties relaxing, felt embarrassed), social disability (been irritable towards other people, had difficulties doing usual activities) and handicap (felt life in general less satisfying, been unable to function in

everyday life). Respondents were asked how often they, because of conditions in their mouth, teeth or dentures had experienced the situations described by each of the items. The reference period used in the current study was the last 12 months. Response options were given on a scale ranging from 0 to 4 (0 = never; 1 = hardly ever; 2 = sometimes; 3 = quite often; and 4 = very often). If one aims to measure an overall unidimensional OHRQoL construct, the OHIP-14 total score, ranging from 0 to 56 points, is obtained by adding together responses for all 14 items. The literature is not conclusive about cut-off values as they may vary across populations, but higher total scores imply a poorer OHRQoL.

Additional self-report oral health-related measures

Three single-item self-report oral health-related measures were included in the present study: 'In total, how is your oral health?' (i.e. perceived overall oral health); 'How content are you with your teeth/dentures?' and 'What is the number of teeth in your mouth?'. For the first two items, response alternatives were given on Likert scales ranging from 1 (very bad/very discontent) to 5 (very good/very content). For the third item, responses were given in number of teeth assessed by the respondents themselves.

Sociodemographics

Sociodemographic variables were included for sample description purposes and included age (in years), gender ('male' and 'female'), ethnicity ('Norwegian/Nordic origin' and 'other origin'), level of education ('high school or less' and 'college/university education'), marital/coexistence status ('living alone' and 'living with partner/others') and use of in-home services (e.g. personal security alarm, food delivery, housecleaning, home nursing care).

Statistical analyses

All analyses were conducted using IBM SPSS Statistics for Windows, Version 27.0 (IBM SPSS Statistics, Armonk, NY).

Factor analysis

Exploratory factor analysis was carried out to investigate the dimensionality of the OHIP-14 in the present study sample. Initially, Hair et al.'s [29] recommendations for assessment of the appropriateness of the data for factor analysis were tested: a correlation matrix with coefficients >0.30, a KMO value ≥0.60 and a significant Bartlett's test ($p<.05$). Next, a combination of the Kaiser [30] criterion (eigenvalue >1), Cattell's [31] scree plot test and substantive evaluation based on previous research was used to determine the factor structure of the data. Since it is reasonable to assume some degree of correlation between the exposed OHIP-14 factors (i.e. they are all supposed to tap into aspects of the OHRQoL construct), oblique rotation was chosen to clarify the factor structure. A factor analytic assessment of dimensional structure includes an evaluation of convergent (i.e. the degree to which measures that theoretically should be related, are in fact related) and discriminant validity (i.e. whether measures that are supposed to be unrelated are, in fact, unrelated) [32]. In the current analyses, factor loadings ≥0.50 on assigned factor was used as a criterion for convergent validity, whereas cross-loadings <0.50 on any other factor were used a criterion for discriminant validity [29]. Internal consistency reliability for the dimensions resulting from factor analysis was tested using Cronbach's alpha with alphas ≥0.70 considered good [33].

Descriptive statistics and bivariate correlations

First, means and standard deviations for continuous and rating scale variables and relative frequencies for categorical variables were calculated. Next, Pearson's correlation analyses were run to assess associations between the exposed OHIP-14 dimensions as an additional test of discriminant validity, using coefficients <0.85 as a cut-off point [34]. Finally, Pearson's correlations were run to describe associations between the OHIP-14 dimensions and additional self-report oral health related variables to assess the dimensions' criterion validity.

Results

Sample characteristics

Of the 1000 individuals invited to take part in the survey, 325 (32.5%) fulfilled the inclusion criteria and completed the questionnaire. Mean age of the participants was 77.23 (±5.19) years, 99.1% was of Norwegian/Nordic origin, 50.9% was female, 34.9% had university/university college level education, 34.1% was living in single-person households and 8.9% received in-home services (Table 1).

Factor analysis

Prerequisites for factor analysis were fulfilled in the data, with 63.4% of correlations above 0.30 (range: 0.21–0.80), a significant Bartlett's test and a KMO value of 0.86, exceeding the recommended value of 0.60. The Kaiser criterion suggested a three-factor solution, while the scree plot showed a

Table 1. Sample characteristics.

Age (years) ($n = 322$)	
Mean	77.23
SD	5.19
Gender ($n = 322$)	
Male	49.1%
Female	50.9%
Ethnicity ($n = 323$)	
Norwegian/Nordic origin	99.1%
Other origin	0.9%
Educational level ($n = 318$)	
College/university education	34.9%
Highschool or less	65.1%
Living arrangement ($n = 323$)	
Living alone	34.1%
Living with partner/others	65.9%
In-home services ($n = 325$)[a]	
Yes	8.9%
No	91.1%

[a]Personal security alarm, food delivery, housecleaning, home care, etc.

Table 2. Factor loadings (bold), Cronbach's alphas (α) and variance explained (R^2) for the final factor solution ($n = 311$).

OHIP-14 items[a]	Psychosocial impacts	Oral function impacts	General function impacts
1. Found it uncomfortable to eat foods		**0.79**	
2. Had an unsatisfactory diet		**0.75**	
3. Had to interrupt meals		**0.77**	
4. Found that sense of taste changed/worsened		**0.58**	
5. Had trouble pronouncing words or sounds	0.46[b]	**0.44**[b]	
6. Felt self-conscious or insecure	**0.79**		0.50
7. Felt tense or stressed	**0.89**		0.43
8. Found it difficult to relax	**0.83**		0.45
9. Felt embarrassed	**0.84**	0.41	
10. Been irritable towards other people	**0.79**		
11. Had painful aching in mouth or teeth	0.47	**0.56**	0.40
12. Had difficulties doing usual activities	0.41	0.43	**0.88**
13. Felt life in general less satisfying	0.65		**0.73**
14. Been unable to function in everyday life			**0.92**
α	0.89	0.75	0.82
R^2	0.42	0.11	0.09

[a]Respondents were asked how often they had experienced the situations described in each of the items over a period of 12 months.
[b]Despite loadings below the chosen cut-off (0.50), this item was placed on the 'oral function impacts' factor after substantial evaluation and internal consistency analyses (i.e. alpha if item deleted-checks).

break at two factors. Three- and two-factor solutions were compared to decide how many factors to retain. The three-factor solution explained 62% of the variance in the data, while the two-factor solution explained 53%. The three-factor solution was also found to be conceptually more reasonable than the two-factor solution and was therefore kept for further analyses. In this solution, factor loadings ranged from 0.41 to 0.92. Five items showed higher loadings on factor 1, five on factor 2 and three items showed higher loadings on factor 3. One cross-loading was observed: the item 'felt life in general less satisfying' showed a loading of 0.65 on factor 1 and a loading of 0.73 on factor 3. However, a higher loading on factor 3 and internal consistency reliability analysis (i.e. alpha if item deleted-checks) militated in favour of keeping this item in factor 3. The item 'had difficulties pronouncing words or sounds' loaded slightly below the chosen cut-off on factor 1 (0.46) and 2 (0.44). Despite loadings below cut-off, substantive evaluation and internal consistency reliability analysis militated in favour of keeping this item in factor 2. The final factors were named *psychosocial impacts* (factor 1; five items), *oral function impacts* (factor 2; six items) and *general function impacts* (factor 3; three items). All factors showed good internal consistency reliability with Cronbach's alphas of 0.89 (psychosocial impacts), 0.75 (oral function impacts) and 0.82 (general function impacts). Item wordings, factor loadings, alpha values and variance explained for each factor in the final solution are presented in Table 2. Scores for each of the three factors were calculated and the condensed measures were used in bivariate correlation analyses.

Descriptive analyses and bivariate correlations

Mean scores and standard deviations for variables included in bivariate correlation analyses are displayed in Table 3. Mean scores for perceived oral health (3.9 ± 0.8), contentment with teeth/dentures (3.9 ± 0.9) and number of teeth (23.9 ± 6.0), suggested overall good oral health in the present study sample. Results from bivariate correlation analyses supported discriminant validity for the three OHIP-14 dimensions exposed by factor analysis with correlation coefficients well below the chosen threshold of 0.85 (range: 0.47–0.59). Statistically significant correlations were also found between the three dimensions and additional self-report oral health-related variables, supporting the criterion related validity of these dimensions (Table 4).

Table 3. Means and standard deviations (SD) for OHIP-14 dimensions and additional oral health-related variables.

	Mean	SD
Psychosocial impacts ($n = 320$)[a]	3.8	3.6
Oral function impacts ($n = 316$)[a]	2.3	2.3
General function impacts ($n = 320$)[a]	1.4	1.8
Perceived oral health ($n = 319$)[b]	3.9	0.8
Contentment with teeth/dentures ($n = 286$)[c]	3.9	0.9
Number of teeth ($n = 312$)	23.9	6.0

[a]Response alternatives: 0 (never), 1 (hardly ever), 2 (sometimes), 3 (quite often) and 4 (very often).
[b]Response alternatives: 1 (very bad), 2 (bad), 3 (neither good nor bad), 4 (good) and 5 (very good).
[c]Response alternatives: 1 (very discontent), 2 (discontent), 3 (neither content nor discontent), 4 (content) and 5 (very content).

Discussion

The primary objective of the present study was to investigate the dimensional structure of the OHIP-14 in a sample of elderly Norwegians. A secondary objective was to describe associations between the exposed OHIP-14 dimensions and additional self-report oral health-related variables to assess the dimensions' criterion validity. Exploratory factor analysis revealed three dimensions named *psychosocial impacts*, *oral function impacts* and *general function impacts*. The convergent and discriminant validity of these dimensions were largely supported, and internal consistency reliability for each dimension was considered good. Results from bivariate correlation analyses supported both discriminant and criterion related validity.

As outlined in 'Introduction' section, research on the dimensionality of the OHIP scale, in either its original, shorter, general or condition specific versions, has yielded various results in different populations. Montero et al. [18] proposed three OHIP-14 dimensions largely resembling the

Table 4. Bivariate correlations between OHIP-14 dimensions, perceived overall oral health, contentment with teeth/dentures and number of teeth.

	Psychosocial impacts	Oral function impacts	General function impacts
Perceived oral health	−0.21*	−0.44*	−0.29*
Contentment with teeth/dentures	−0.08	−0.19*	−0.09
Number of teeth	−0.09	−0.30*	−0.07

*$p < .01$.

dimensions revealed in the present work. Their analysis was based on data derived from a sample of healthy Spanish adults (mean age 45.2 ± 9.5, $n = 270$) and the dimensions were named *psychosocial impacts*, *pain/discomfort* and *functional limitation*. Although the number of factors extracted by Montero et al. was the same as in the present study, there were differences regarding their composition. For example, Montero et al.'s eight-item *psychosocial impacts* factor included items that were split into the five-item *psychosocial impacts* factor and the three-item *general function impacts* factor in the present study. Furthermore, Montero et al.'s four-item *pain/discomfort* factor included four of the same items as the six-item *oral function impacts* factor revealed in the present study, which also included the items 'felt sense of taste changed/worsened' and 'had trouble pronouncing words or sounds'. The latter two items were placed on Montero et al.'s two-item *functional limitation* factor. Also, the alpha values differed somewhat between the studies: while the present study reported alphas ranging between 0.73 and 0.89, Montero et al. reported alphas ranging from 0.46 to 0.84. Despite these differences, both studies found that the first factor (named *psychosocial impacts* in both studies) strongly dominated the factorial structure by explaining a large percent of variance in the data: 42 out of 62% (present study) and 27 out of 58% (Montero et al.). A dominant first factor has also been found in other studies assessing the dimensionality of the OHIP-14 [20,21,35]. High intercorrelation of items has been suggested as the reason for obtaining one dominant factor and interpreted as the presence of one underlying construct representing 'oral ill-health' [35]. Thus, it is proposed that the OHIP-14 may be characterized by *either* one strong general factor (i.e. oral ill-health) *or* a number of correlated dimensions that can be interpreted in the light of substantive knowledge [16]. It is worth noting that although the application of a single overall score for all OHIP-14 items (representing one general factor) may be sufficient to reveal the presence of oral ill-health, definition of its dimensions is necessary if one aims to characterize the nature of oral ill-health in a particular context [36].

The three-dimensional structure proposed by Montero et al. [18] has been tested and compared to a unidimensional structure by Santos et al. [21], analysing data from Brazilian post-partum women ($n = 504$) and older adults aged 60+ ($n = 848$). Although confirmatory factor analysis demonstrated adequate fit for both the three-dimensional and the unidimensional structure in both samples, correlations between the three dimensions proposed by Montero et al. [18] were relatively high (range: 0.77–0.95), compromising discriminant validity. Thus, applying separate scores for these dimensions would not be appropriate for assessing OHRQoL in post-partum women and older adults in a Brazilian setting. In the present study, however, correlations well below the chosen threshold of 0.85 [35] supported discriminant validity of the three dimensions revealed by exploratory factor analysis on data obtained from elderly Norwegians. Moreover, criterion related validity was supported by correlations between the exposed dimensions and additional self-report oral health-related variables: The most 'general' oral health-related variable measuring *perceived oral health* (reflecting issues concerning overall oral health), showed statistically significant correlations with all three dimensions (i.e. psychosocial impacts, oral function impacts and general function impacts). The more 'specific' variables measuring *contentment with teeth/dentures* and *number of teeth* (reflecting issues concerning teeth and/or dentures in particular) showed statistically significant correlations with only the dimension representing oral function impacts. These findings make sense, as functional teeth/dentures and/or a sufficient number of teeth are obvious prerequisites for fundamental oral functions such as biting and chewing. However, an individual's perception of his/her overall oral health may include oral health-related matters beyond those directly related to teeth or dentures and could therefore be assumed to be associated with several aspects of OHRQoL as indicated in this study. Still, it is important to be aware that the dimensional structure exposed for a specific *instrument* measuring OHRQoL (here: the OHIP-14) in a sample, is not necessarily the actual dimensional structure of the *phenomenon* (or construct) OHRQoL in this sample. The degree to which a measurement instrument can capture a construct and its dimensions will depend on its quality, which may be a matter of discussion. As mentioned in 'Introduction' section, John et al. [23] suggest that a particular four-factor structure is the most plausible characterization of OHRQoL regardless of which version of the OHIP (or other OHRQoL instrument) is used, and that it includes the dimensions *oral function*, *orofacial pain*, *orofacial appearance* and *psychosocial impact*. In their presentation of how the various OHIP versions measure these dimensions, OHIP-14 seems to be a relatively good measure of *psychosocial impact* and *oral function*, which resembles the findings of the current study. However, it appears to be suboptimal compared to other OHIP versions when it comes to measuring *orofacial appearance* since none of its items directly refers to appearance. This may explain the lack of exposure of this specific dimension in the present study and should be taken into account when

interpreting findings of this and similar studies assessing the dimensional structure of the OHIP-14.

Anyhow, latent constructs such as QoL (including OHRQoL) are vague and often difficult to measure [37], and perfect conceptual equivalence across populations and cultural borders may not be possible [38]. Thus, it should not come as a surprise that both the dimensional structure and the composition of OHIP dimensions appear to vary across contexts. Furthermore, demographic factors such as age, gender and socioeconomic position may influence perceptions of oral health and QoL within a particular context [39]. Therefore, it seems worthwhile to consider both the dimensional structure *and* the composition of dimensions before application of OHIP scales and similar instruments in novel contexts.

The application of an overall OHIP-14 score (reflecting a unidimensional OHRQoL construct) was outside the scope of this study. Yet, the OHIP-14 total score in the present study sample should be mentioned. Interestingly, this score (7.2 ± 6.6) was somewhat higher than reported in previous Norwegian studies on older adults. For example, a mean score of 5.5 (SD 7.3) was reported in a sample of 137 elderly patients receiving home-care nursing [40] and a mean score of 3.4 (SD 5.1) was reported in a sample of 151 older adults aged 68–77 years [26]. Discrepancies in overall scores between studies may have several possible explanations, including sample characteristics, differences in sample size and sampling methods. For example, the present study had a sample about twice the size of the samples in the above-mentioned previous studies. Generally, a larger sample size implies better precision of estimates [41]. Thus, the overall OHIP-14 score obtained in the present study may, at least theoretically, be more precise than the scores obtained in the two other Norwegian studies. Nevertheless, since estimation of population parameters is not among the aims of the present study, this matter will not be further discussed here.

Strengths and limitations

One strength of the present study is that it responds to a call for continued research on the dimensional structure of instruments assessing OHRQoL across populations and contexts [6,13,18]. To the author's knowledge, this study is the first to investigate the dimensionality of the OHIP-14 among older adults in a Norwegian setting. Another strength is that the study has a sufficiently large sample size to allow for the application of factor analytic techniques. According to Guadagnoli and Velicer [42], an adequate sample size is one of the most important factors for determining a stable factor structure. Pett et al. [43] have recommended at least 10–15 subjects per item, and the present study more than satisfies these recommendations with its sample counting 325 respondents. Furthermore, results from various analyses, including factor analysis, internal consistency reliability and bivariate correlations all support the validity of the three-dimensional structure of the OHIP-14 exposed in the present study sample.

Among the limitations of this work is the application of self-report measures, which may increase the risk of bias related to recall, introspective ability (i.e. subjects may not be able to assess themselves accurately), interpretation of questionnaire items and sampling (i.e. people who complete the questionnaire are the sort of people who are inclined to complete a questionnaire) [44]. Additional limitations are the study's modest participation rate and constrained generalizability, as the findings are restricted to a rather delineated group of Norwegian older adults with fairly good oral health as reflected by the large number of teeth (mean: 23.9 ± 6.0) and high mean scores on perceived oral health and contentment with teeth/dentures. Finally, although the associations found between the three dimensions resulting from factor analysis and additional self-report oral health-related variables supported the dimensions' criterion validity, their low to moderate values indicate that they should be interpreted with caution.

Conclusive remarks

A three-dimensional structure of the OHIP-14 was exposed and validated in the present study sample. Since different aspects of OHRQoL may be perceived and weighted differently in various populations, suggestions for future research include more profound investigations of the construct validity of instruments assessing OHRQoL. Such research should include an exploration of various dimensions and the weights given to them through qualitative research in the target population(s). After all, what matters to someone is not always what's the matter with someone.

Note

1. The Pensioners' Association is a politically neutral organization for people that have retired from work. The organization has about 240,000 members, which represent about 24% of the total number of Norwegian pensioners. The association aims to preserve the members' social, economic, cultural and health-related interests.

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Disclosure statement

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