The Norwegian Occupational Wholeness Questionnaire (N-OWQ): Scale development and psychometric properties

Authors:

Tore Bonsaksen[1, 2] and Farzaneh Yazdani[3]

[1] Department of Occupational Therapy, Prosthetics and Orthotics, Faculty of Health Sciences, Oslo and Akershus University College of Applied Sciences, Oslo, Norway

[2] Faculty of Health Studies, VID Specialized University, Sandnes, Norway

[3] Faculty of Health and Life Sciences, Oxford Brookes University, Oxford, United Kingdom

Author correspondence:

Tore Bonsaksen, Department of Occupational Therapy, Prosthetics and Orthotics, Faculty of Health Sciences, Oslo and Akershus University College of Applied Sciences, PO Box 4 St. Olavs Plass, 0130 Oslo, Norway. E-mail tore.bonsaksen@hioa.no Tel. +47 67 23 66 11

Abstract

Background: Occupational therapy has long emphasized the concepts doing, being, becoming and belonging, and a notion of balance between them. Measures of these concepts are in a developing stage.

Aim: This study aimed to develop and examine the properties of the Norwegian version of the Occupational Wholeness Questionnaire (N-OWQ), which is proposed to measure being, becoming, and belonging, in addition to occupational wholeness as a higher-order concept.

Methods: An anonymous sample of 248 persons over the age of 18 years completed the N-OWQ along with sociodemographic information. Principal Components Analysis (PCA) was performed on the scale items when examining factor structure. Item reduction was based on considerations of communalities, factor loadings, scale consistency if item deleted, and conceptual issues. Internal consistency was assessed with Cronbach's α.

Results: Following the PCA, the "Being" and "Becoming" scales merged into one five-item "Self" scale (Cronbach's α 0.77). The "Belonging" scale items were split into two scales comprised by three items each: "Closeness" (Cronbach's α 0.70) and "Relatedness" (Cronbach's α 0.73).

Conclusions: The revised N-OWQ merged the "Being" and "Becoming" items into one factor, whereas the "Belonging" items were split into two distinct factors. Internal consistency for all scales were satisfactory.

Keywords: factor analysis, occupational science, psychometrics, reliability, validity

Introduction

The concepts of doing, being, becoming and belonging, and the interaction and balance between these phenomena, have long been the concern of occupational science and multidisciplinary groups (1-4). According to the proposed Model of Occupational Wholeness (MOW), doing is conceptualized as the medium by which humans fulfill their needs related to being, becoming and belonging (5). Within the occupational therapy literature, the doing or occupation is often described as the focus of goal setting and intervention planning. However, the ways by which doing may contribute to fulfilling the person's needs for being, becoming and belonging are rarely made explicit, thus the concepts' impact on practice appear to be weak (3). Moreover, to be able to study systematically the impact of doing on the person's needs fulfilment, there is a need to develop and ascertain the validity of instruments by which this impact can be measured.

The Occupational Wholeness Questionnaire (OWQ; 6) was developed based on the principles of the MOW (5). In this model, being refers to who we understand ourselves to be at present. Becoming is an extension of being, taking into account the further development of a person's competence and need for autonomy, which moves the person beyond the present state. Another extension is belonging, a dimension concerned with the persons' relationships and affiliation to things, places and other people. In agreement with Wilcock (7), doing is considered synonymous to occupation in this model, thus occupations help us fulfil our needs (5).

The new concept, occupational wholeness, expands on previous notions of occupational balance in that it goes beyond the principle that health and well-being arises from a person's balance between performing different types of occupations, or in terms of performing the right amount of occupations (8). These aspects of occupational balance have been the focus in the development process of other instruments in Scandinavia, like the

Occupational Balance Questionnaire (OBQ; 9, 10) and the Profiles of Occupational Engagement in people with Schizophrenia (POES; 11, 12). Instead, occupational wholeness refers to a sense of being in one piece as a whole, and "this sense of wholeness arises when people can meet their needs for being, becoming and belonging through what they do" (5). Thus, the concept was not linked to objective measures of time use in different occupations or areas of occupation, but rather to the person's subjective perception of how his own doing affects him.

In an attempt to bring theory and practical assessment together, Yazdani (6) developed a questionnaire aiming to elicit a profile of a person's doing that contributes to his or her occupational wholeness. First, the concepts identified from previous research (13, 14) were transformed into questions. After several reviews, the concepts were mapped against two main theoretical frameworks: occupational science based on Wilcock (1) and self-determination theory based on Deci and Ryan (15). The link to occupational science was reflected in a view of doing as at the core of the human existence, and that doing affects who we perceive ourselves to be at present (being), who we want to become (becoming), and the degree to which we feel we belong (belonging). Thus, each of the items start with the phrase "Things I make time for doing", and each of the items was designed to link with one of the main concepts – being, becoming or belonging – in combination with a secondary concept like interest, value or role. The link to self-determination theory was established by phrasing the items so that they reflected the three basic psychological needs highlighted by this theory: autonomy, competency and affiliation (15). In the phrasing of the items, these needs would for example express a relationship or a connection to the community or society, or a lack of such. They could also express a sense of competence, mastery, control, or personal choice. As in recent studies (13, 14), these concepts from self-determination theory were found to be significant in relationship to human doing, being, becoming and belonging.

After having developed the items and linked them to the theoretical concepts they were meant to measure, the preliminary instrument was sent to an expert panel consisting of 10 occupational therapy academics. The expert panel rated each item, considering the extent to which they considered the items to be valid expressions of the relevant concept. The expert panel's ratings were generally positive, and it was therefore decided to proceed with a formal study of the psychometric properties of the new assessment tool. As the Norwegian research group in Oslo had taken interest in the development of the questionnaire, they were chosen to be the first country to conduct such an investigation.

Study aim

The aim of the study was to revise and examine the factor structure of the Norwegian version of the Occupational Wholeness Questionnaire in a mixed sample of adult persons in Norway. In addition, the aim was to establish measures of reliability (internal consistency) related to the resulting factors.

Methods

Design, survey procedure and sample

The study had a cross-sectional survey design. The questionnaire was distributed as an online survey, and participants gained access to the survey by an internet link that was distributed widely via social media channels (Facebook, Twitter, and LinkedIn). The link to the survey was also posted on professional groups on Facebook. For the most part, these were related to occupational therapy and occupational therapy education, as we believed – given the study's grounding in the occupational therapy profession – posting on such groups would attract the most interest. When accessing the questionnaire the participants were provided with the following information (here translated into English): "At Oslo and Akershus University College of Applied Sciences a new questionnaire is being tested. It is designed to measure

how the things we do in life impact on us in different ways. Responding to the questionnaire will take about 10 minutes. The survey is anonymous, and all persons over the age of 18 years who live in Norway are invited to participate."

As the survey was in Norwegian, persons able to understand and adequately respond to a Norwegian language survey consequently comprised the sample. The link to the survey was open for accessing from 17 January 2017 to 31 January 2017. As the study was an explorative inquiry into a new and developing instrument, we decided to use the data that we were able to collect during a two-week period. No further attempts were made to recruit more participants after the survey was closed. The required sample size was determined by considering the general rule that there should be at least 10 cases per included variable (16). However, in view of the conceptually diverse items in the OWQ, we estimated that about 1/3 of the questionnaire items would be removed following the analytic procedures. Thus, a sample of approximately 200 participants or more was considered satisfactory.

Instrumentation

The original 32-item Occupational Wholeness Questionnaire (OWQ) was developed by Yazdani (6). Building from the established occupational therapy and occupational science literature, the OWQ items were developed based on theoretical descriptions of the concepts being, becoming, and belonging. Scales are generally developed by collating several items that are believed to reflect aspects of the same underlying concept (17). Considering the 32 items in the OWQ, twelve items were thought to comprise the "being" scale, whereas ten items were thought to comprise each of the "becoming" and "belonging" scales. Some of the items on the instrument were positively formulated, whereas others were negatively formulated. For the latter, scores were reversed before being subjected to analysis. Items were scored: 1 = totally disagree, 2 = disagree, 3 = agree, 4 = totally agree. The original items and their proposed relationships to the three proposed scales are shown in Table 1.

[TABLE 1 ABOUT HERE]

The Norwegian version of the Occupational Wholeness Questionnaire (the N-OWQ; 18) was translated by the first author and back-translated into English by a person proficient in Norwegian and in English. Subsequently, the instrument developer checked the content of the back-translated version for correctness and conceptual clarity by comparing it with the original version (6). No further amendments were required after the checking of the back-translation. Finally, a panel of Norwegian occupational therapists scrutinized the N-OWQ for conceptual clarity, wording and phrasing with a view to the Norwegian context for which the measure is intended. Several improvements related to language, terms and phrasing were made to the instrument following the review panel discussion, in which the developer of the original instrument participated to ensure that the two versions were harmonized (19). In addition to the N-OWQ, information regarding the participants' age, gender, work status and education background was collected.

Data analysis

The data were entered into the computer program IBM SPSS, version 24 (20). Descriptive analyses were performed on all items using median values (*Md*), range (min-max), frequencies and percentages in combination. Latent factors were explored with Principal Component Analyses (PCA). The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (21), in combination with Bartlett's Test of Sphericity (22), were used to assess whether the data were adequate for factorization, and KMO measures should exceed 0.60 in order to proceed with factorization (21, 23). Extraction of factors was determined by visual inspection of the scree-plots, assessment of Eigenvalue (λ) estimates and assessment of the variance explained by the factors. Factors with $\lambda > 1$, which also explained more than 10 %

the items' variance proportions, were subjected to further analysis and item reduction (24). Items were removed from the scales based on a combined assessment of their communalities (the variance proportion of each variable explained by the factors together), factor loadings (estimates of the impact from a given variable on each factor), scale reliability if item deleted, the number of items on the scales, as well as conceptual issues (16, 17). Factor loadings > 0.40 were considered high (25). Considering that the original scales had 10 (becoming and belonging) and 12 (being) items, it was decided that all revised scales should have a minimum of three items. The rationale for this criterion was that it would 1) secure a conceptual connection between the contents of the original and the revised scales, and 2) secure a meaningful assessment of the revised scale's reliability. Scale reliability (internal consistency) was examined with Cronbach's α, and $\alpha > 0.70$ were considered satisfactory (17). Statistical significance for all analyses was set at $p < 0.05$.

Ethics

Because the collected data was 1) not sensitive and 2) not linked to the participants' identities in any way (i.e., all the data were anonymous), approval for conducting the study was not required. As part of the initial instructions for the survey, the participants were explicitly informed that completing and submitting the online survey would be considered as their informed consent, and that the responses would be used for research purposes.

Results

Participants

The characteristics of the study participants are displayed in Table 2. The sample was largely comprised by women (91.5 %), most were working full time or part time (86.3 %), and most had some experience from higher education (76.6 %). There were no statistically significant differences between men and women in the sample.

[TABLE 2 ABOUT HERE]

The "Being" scale: Item reduction, factor structure and internal consistency

For the items comprising the "Being" scale (see Table 1 for overview), the KMO value was 0.75 and Bartlett's test of sphericity was statistically significant ($p < 0.001$), indicating that the dataset was appropriate for factor analysis. Three factors had Eigenvalue > 1, the factors together explaining 51.1 % of the data variance. The items' communalities were between 0.33 and 0.65. Among the items loading most strongly on Factor 3, item # 8 had split loadings on Factor 1 and Factor 3 and was deemed conceptually unclear, and was therefore removed. The two remaining items (# 6 and # 3) on Factor 3 were removed as the scales were required to consist of at least three items. Among the items comprising Factor 2, item # 31 had a strong negative loading. The scores had been reversed for this item, as it was meant to indicate a focus on making others happy in contrast to making oneself happy. However, the phrasing of the item did not include this contrast, and it was therefore deemed conceptually ambiguous and removed. Items # 16 and # 32 were then removed as there were only two items left on Factor 2. The six remaining items all loaded strongly on Factor 1, and there were no split loadings. However, item # 20 was removed for conceptual reasons as it was considered the negative version of # 28, and of the two items # 28 had the highest factor loading.

The subsequent factor analysis of the "Being" scale therefore included the items loading on Factor 1, excepting item # 20. One factor with Eigenvalue > 1 was extracted, explaining 49.8 % of the data variance. Item #2 showed the lowest factor loading (0.50) of the included items, and the subsequent reliability analysis showed that the scale's internal consistency increased by removing this item. As a result, we conducted yet another analysis

omitting also item # 2. One factor had Eigenvalue > 1, and all items loaded strongly on this factor. Internal consistency of the four items was 0.76. Removing item # 22 from the scale would increase reliability to 0.77, whereas removing any of the other items would decrease reliability. However, considering the number of items on the scale and the substantial factor loadings, it was decided that all four items were retained on the "Being" scale. Table 3 displays the results of the factor analyses of the initial and the revised "Being" scale, with factor loadings sorted by size.

[TABLE 3 ABOUT HERE]

The "Becoming" scale: Item reduction, factor structure and internal consistency

For the items comprising the "Becoming" scale (see Table 1), the KMO value was 0.89 and Bartlett's test of sphericity was statistically significant ($p < 0.001$), indicating that the employed variables were appropriate for factor analysis. Two factors had Eigenvalue > 1, and the factors together explained 58.2 % of the variance. The items' communalities were between 0.26 and 0.75. All items, except for item # 24 (Factor 1) and item # 4 (Factor 2), showed split loadings, so in terms of item reduction we were unable to pursue with the split loading strategy. First, we removed item # 1 due to its low communality measure and because it conceptually overlapped with item # 23. Items # 15, # 19 and # 23 were considered conceptually overlapping, and of the three items we decided to retain the positively formulated item # 23 for conceptual reasons, and in order to obtain a balance between positively and negatively formulated items. Item # 24 was considered conceptually inappropriate as its content was directed towards the present ("Being") and not the future ("Becoming"). Finally, item # 7 was removed because of its conceptual overlap with item # 11.

The subsequent factor analysis of the "Becoming" scale therefore included five items (items # 4, # 11, # 23, # 27, and # 30). One factor had Eigenvalue > 1, explaining 53.7 % of the data variance, and all items loaded strongly on this factor. Internal consistency of the five items was 0.78, and removing any of the items would result in decreased internal consistency of the scale. Table 4 displays the results of the factor analyses of the initial and the revised "Becoming" scale, with factor loadings sorted by size.

[TABLE 4 ABOUT HERE]

The "Belonging" scale: Item reduction, factor structure and internal consistency

For the items comprising the "Belonging" scale (see Table 1), the KMO value was 0.79 and Bartlett's test of sphericity was statistically significant ($p < 0.001$), indicating that the variables were appropriate for factor analysis. Three factors had Eigenvalue > 1, and the factors together explained 62.5 % of the variance. The items' communalities were between 0.51 and 0.71. Factor 3 consisted of two items only (Items # 5 and # 10), and these items were therefore removed. Item # 21 has substantial split loading on Factor 1 and Factor 2, and was removed for that reason. Items # 12 and # 14 had very similar content, and of the two we decided to remove item # 12 because of its more complex formulation. Item 14 also had split loading, but was retained in consideration of its conceptual link with the two other items loading on this factor (items # 25 and # 29).

The subsequent factor analysis of the "Belonging" scale therefore included six items (items # 9, # 13, # 14, # 17, # 25 and # 29). Two factors had Eigenvalue > 1, explaining 65.2 % of the data variance. Three items loaded on each of the two factors, and there were no split loadings. Internal consistency of the three items loading on Factor 1 was 0.73, and removing any of the items would result in decreased internal consistency of the scale. Internal

consistency of the items loading on Factor 2 was 0.70, and removing any item would decrease internal scale consistency. Table 5 displays the results of the factor analyses of the initial and the revised "Belonging" scale, with factor loadings sorted by size.

[TABLE 5 ABOUT HERE]

The Norwegian Occupational Wholeness questionnaire: Final scale revisions

After revising and shortening the instrument focusing on one proposed scale at a time, the N-OWQ consisted of 15 items. At this point, we included the remaining 15 items into a factor analysis. Three factors had Eigenvalue > 1, and the factors together explained 57.4 % of the variance. The communalities of the items were between 0.36 and 0.73. Factor 1 was comprised by the "Being" and "Becoming" scale items together, but excluding items # 11 and # 30. These items had split loadings, but loaded most strongly on Factor 3. Factor 2 consisted of the items comprising a tentative "Closeness" dimension of belonging: items # 9, # 13 and # 17. Factor 3 consisted of the items comprised by a tentative "Relatedness" dimension of belonging: items # 14, # 25 and # 29, in addition to the items that also loaded on Factor 1. In order to obtain a clearer factor structure, we removed the four items with split loadings and performed a new analysis with the remaining 11 items.

Including the 11 remaining items in the subsequent analysis, three factors had Eigenvalue > 1, and the factors together explained 59.9 % of the variance. The communalities of the items were between 0.36 and 0.73. Only one item (# 28) had split loadings, on Factor 1 and Factor 3, but with the strongest loading on Factor 1. Thus, we considered the factor structure to be sufficiently clean and to display distinct factors, each explaining more than the required 10 % of the data variance. Each of the factors had satisfactory internal consistency between the items (Cronbach's $\alpha \geq 0.70$). The results from the factor analysis of the revised

11-item N-OWQ is shown in Table 6, and the final version of the instrument, showing items, scoring and the empirically derived scales, is displayed in Table 7.

[TABLE 6 AND 7 ABOUT HERE]

Discussion

In this factor-analytic study of the N-OWQ, the original 32-item instrument was reduced to 11 items. The resulting questionnaire items comprise three scales: self (five items), closeness (three items), and relatedness (three items). Thus, the structure of the revised instrument is somewhat different from the theoretical assumptions on which it was developed (1-3, 7). All items except item # 28 showed high loadings related to only one factor, thus indicating strong relationships between the scale items and the common core concepts (the scale labels). All scales showed good internal consistency between the included items.

The items of the original questionnaire were based on theory and previous research (1, 13, 15), and their theoretical validity was explored as part of the process of developing the questionnaire. It was assumed that the items would be linked with the theoretical concepts of being, becoming and belonging to differing degrees. This assumption constituted the rationale for including a relatively large number of items in the original questionnaire (6), so that we could explore different ways of measuring each concept. In line with previous theory and research (2, 3, 13, 14), the questionnaire attempted to separate the being and becoming concepts by emphasizing the present in the being items, and conversely, by emphasizing the future in the becoming items. In spite of these efforts, it appeared that the questions did not separate between the two concepts in a meaningful way, as we found that the being (items # 22 and # 28) and becoming items (items # 4, # 23, and # 27) loaded on the same factor (see Table 6). However, previous theoretical arguments have also indicated a strong and

inseparable link between the being and becoming concepts, because: “Without an understanding of the person’s being, authentic, realistic, and relevant goals cannot be set. Conversely, a person’s being is shaped as their goals are met and new futures become possible” (3; p. 252). This study provides empirical support for a view of the being and becoming concepts as hard to separate from each other. The belonging dimension of the questionnaire was conceptually more complicated to address. When translating the OWQ from English into Norwegian, we found it difficult to address the full depth of this concept. Translating the OWC into Persian and Arabic confirmed that there were difficulties in common. In particular, the expression “belong to” in relation to place was difficult to translate. In each of the languages, the equivalent expressions appeared either spiritual, poetic or simplified. More work was needed to clarify the item content, as simply translating the expression seemed insufficient in order to transfer the meaning.

This study demonstrated that the N-OWQ measured two separate and distinct aspects of belonging: closeness and relatedness. While the first concept, comprised by items # 9, # 13, and # 17, addresses family attachments and personal relationships based on emotions, the second concept, comprised by items # 14, # 25 and # 29, addresses community participation and companionship – or rather, the lack of such (see Table 7). Nonetheless, the challenges related the belonging scale, both in terms of item translation and scale development, reflect the concept’s status in the occupational therapy literature. Belonging has relatively recently been added to the field of occupational therapy studies (2, 3, 5, 26). Hitch and coworkers (3) noted that studies to date have contributed far more to developing the concepts of doing and being, compared to those of becoming and belonging. Thus, there is little in-depth research about doing in relationship to belonging. This study demonstrates that the concept of belonging, as measured with the N-OWQ, comprises two distinct yet related concepts.

Study limitations and future studies

The study sample was largely comprised of relatively young female adults who worked full-time or part-time, and who had experience from higher education (see Table 2). The recruitment procedure, using various social media channels, including Facebook groups dedicated to occupational therapy and occupational therapy education, presumably contributed to the skewed distribution on several variables. Occupational therapy education in Norway is at the undergraduate level, thus requiring occupational therapists to have higher education. Thus, if we assume that a substantial sample proportion was in fact occupational therapists or occupational therapy students, this may have contributed to a sample largely consisting of persons with higher education. Similarly, occupational therapy students are largely female, and assuming that many occupational therapy students responded to the Facebook posting, this could add to the proportion of females in the sample. Moreover, most students in occupational therapy education are in their twenties, and young persons are likely to use Facebook and other social media channels more frequently compared to persons of higher age. Because of the skewed distributions, and the resulting homogeneity of the study sample, one should consider these sample characteristics when generalizing from the study results.

This study has focused on reporting about the development and psychometric properties of the N-OWQ scales. In addition, it is assumed that a higher-order concept, occupational wholeness, can be obtained by combining scores on the instrument with a measure of each item's respective importance as subjectively experienced by the person. The adjusted sum score of all items, as described in Table 7, serves as a preliminary measure of occupational wholeness. It is only preliminary because we have not yet established a procedure for weighting items according to their relative importance. Establishing such a procedure represents an important line of further study related to the Model of Occupational Wholeness (5).

The questionnaire design was originally based on a Rasch-analytic approach (27, 28), and future studies should supplement the data analysis by performing this procedure. A Rasch analysis might provide more details concerning the measurement properties of the questionnaire, and might add new possibilities with a view to constructing a higher-order measure of occupational wholeness. Subsequent analyses may also be used to revise the questionnaire. Ultimately, the N-OWQ will need to be explored among participants with variety of clinical conditions in order to test its applicability in practice.

Conclusion

This study reported about the development and measurement properties of the scales comprising the N-OWQ. The resulting scales may be used to measure the degree to which a person's doing supports his sense of self, his sense of closeness, and his sense of relatedness – all of these being aspects with similarities as well as differences in relationship to the being, becoming and belonging concepts from which the study was instigated. In due time, the N-OWQ may be used by occupational therapists as a screening tool to identify a person's most pressing occupational needs areas. The measurement properties of the 11-item N-OWQ needs more investigation. In particular, a higher-order measure of occupational wholeness is yet to be developed.

Acknowledgements

We are grateful for the responses from all the participants. We are also grateful for the efforts contributed by the Norwegian review panel: Thea Moos Opseth, Mikkel Magnus Thørrisen, Ingunn Myraunet, Brian Ellingham, and Ratna Anand Hussain, and for Karoline Ekse Jenssen's efforts in disseminating the link to the online questionnaire via various social media channels.

Competing interests

The authors have no competing interests.

Funding

The study received no funding from any source.

References

1. Wilcock A. An occupational perspective of health. Thorofare, NJ: SLACK Inc.; 2006.

2. Hitch D, Pépin G, Stagnitti K. In the Footsteps of Wilcock, Part One: The Evolution of Doing, Being, Becoming, and Belonging. Occupational Therapy In Health Care. 2014;28(3):231-46.

3. Hitch D, Pépin G, Stagnitti K. In the Footsteps of Wilcock, Part Two: The Interdependent Nature of Doing, Being, Becoming, and Belonging. Occupational Therapy In Health Care. 2014;28(3):247-63.

4. Matuska KM, Christiansen C. Life balance. Multidisciplinary theories and research. Thorofare, NJ: AOTA Press/SLACK Inc.; 2009.

5. Yazdani F, Bonsaksen T. Introduction to the Model of Occupational Wholeness. ErgoScience. 2017;12(1):32-6.

6. Yazdani F. The Occupational Wholeness Questionnaire. 2016.

7. Wilcock A. Reflections on doing, being, and becoming. Canadian Journal of Occupational Therapy. 1998;65(5):248-56.

8. Christiansen C, Matuska KM. Lifestyle balance: A review of concepts and research. Journal of Occupational Science. 2006;13(1):49-61.

9. Wagman P, Håkansson C. Introducing the Occupational Balance Questionnaire (OBQ). Scandinavian Journal of Occupational Therapy. 2014;21(3):227-31.

10. Wagman P, Håkansson C, Björklund A. Occupational balance as used in occupational therapy: A concept analysis. Scandinavian Journal of Occupational Therapy. 2012;19(4):322-7.

11. Bejerholm U. Occupational balance in people with schizophrenia. Occupational Therapy in Mental Health. 2010;26(1):1-17.

12. Bejerholm U, Eklund M. Occupational engagement in persons with schizophrenia: Relationships to self-rated variables, psychopathology, and qualty of life. American Journal of Occupational Therapy. 2007;61(1):21-32

13. Yazdani F, Roberts D, Yazdani N, Rassafiani M. Occupational balance: A study of the sociocultural perspective of Iranian occupational therapists. Canadian Journal of Occupational Therapy. 2016;83(1):53-62.

14. Harb A, Yazdani F, Rassafiani M, Yazdani N, Nobakht L. Occupational therapists' perception of occupational balance and experience of its application in practice. Manuscript submitted for publication. 2017.

15. Deci EL, Ryan RM. Self-determination theory: A consideration of human motivational universals. In: Corr PJ, Matthews G, editors. The Cambridge handbook of personality psychology. Cambridge: Cambridge University Press; 2009. p. 441-56.

16. Field A. Discovering statistics using SPSS. 2 ed. London: Sage Publications; 2005 2005.

17. Streiner DL, Norman GR. Health measurement scales - a practical guide to their development and use. 4 ed. Oxford: Oxford University Press; 2008.

18. Bonsaksen T, Opseth TM, Myraunet I, Hussain RA, Thørrisen MM, Ellingham B, et al. Hva gjør du i livet ditt? [What do you do in your life?]. 2016.

19. Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, et al. Principles of good practice for the translation and cultural adaptation process for patient-reported outcomes (PRO) measures: Report of the ISPOR Task Force for translation and cultural adaptation. Value in Health. 2005;8(2):94-104.

20. IBM Corporation. SPSS for Windows, version 24. Armonk, NY: IBM Corp.; 2016.

21. Kaiser HF. An index of factorial simplicity. Psychometrika. 1974;39(1):31-6.

22. Bartlett MS. A note on multiplying factors for various chi square approximations. Journal of the Royal Statistical Society. 1954;16(2):296-8.

23. Cerny BA, Kaiser HF. A study of a measure of sampling adequacy for factor-analytic correlation matrices. Multivariate Behavioral Research. 1977;12(1):43-7.

24. Kaiser HF. The application of electronic computers to factor analysis. Educational and Psychological Measurement. 1960;20(1):141-51.

25. Stevens J. Applied multivariate statistics for the social sciences. Mahwah, NJ: Lawrence Erlbaum; 1996.

26. Hammel KW. Belonging, occupation, and human well-being: an exploration. Canadian Journal of Occupational Therapy. 2014;81(1):39-50.

27. Bond TG, Fox CM. Applying the Rasch model. Fundamental measurement in the human sciences. Mahawah, New Jersey: Erlbaum Publishers; 2001.

28. Andrich D. Rasch Models for Measurement. Newbury Park, CA.: SAGE; 1988 1988.

Table 1

The original N-OWQ 32: items and proposed relationships to theoretical concepts

Things I make time for doing	*Concept*
1) contributes to my becoming the person I want to be	Becoming
2) is consistent with my abilities	Being
3) demands less/more than what I can do	Being
4) contributes to my meeting the expectations of what I am able to do	Becoming
5) is accepted by society	Belonging
6) prevents me from thinking about my needs except for the basic ones (food, shelter, personal care and so on)	Being
7) prevents me from achieving what is important to me	Becoming
8) prevents me from acting based on what I think about my abilities	Being
9) keeps me part of my family	Belonging
10) contributes to me having a role in my community	Belonging
11) leads me farther away from my goals	Becoming
12) prevents me from fulfilling roles in the society/community	Belonging
13) makes me feel that I belong to the places I like	Belonging
14) prevents me from having a role in my community	Belonging
15) prevents me from developing like I want to	Becoming
16) contributes to my covering my basic needs (food, shelter, personal care, and so on)	Being
17) makes me feel I belong together with the people I am fond of	Belonging
18) is meaningful to me	Being
19) contributes to my personal development	Becoming
20) is decided for me by others, or by society	Being
21) keeps me away from the people that I fond of	Belonging
22) has no value to me	Being
23) contributes to my becoming the person I want to be	Becoming
24) prevents me from doing what I like	Becoming
25) makes me feel lonely	Belonging
26) are things that I like to do	Being
27) contributes to creating a future that fits with my interests	Becoming

28) is based on my own choices	Being
29) prevents me from being where I feel I belong	Belonging
30) prevents me from succeeding with the things I have the abilities to do	Becoming
31) makes others satisfied	Being
32) gives me a sense of being in control	Being

Table 2

Sociodemographic characteristics of the study participants (n = 248)

Characteristics	All (n = 248)	Men (n = 21)	Women (n = 227)	
	Md (range)	*Md (range)*	*Md (range)*	*p*
Age (years)	32 (18-72)	39 (18-65)	32 (19-72)	0.68
Working	*n* (%)	*n* (%)	*n* (%)	*p*
Full time work	155 (62.5)	13 (61.9)	142 (62.6)	0.71
Part time work	59 (23.8)	4 (19.0)	55 (24.2)	
Not working	34 (13.7)	4 (19.0)	30 (13.2)	
Studying	*n* (%)	*n* (%)	*n* (%)	*p*
Studying full time	62 (25.0)	4 (10.9)	58 (25.6)	0.80
Studying part time	24 (9.7)	2 (9.5)	22 (9.7)	
Not studying	162 (65.3)	15 (71.4)	147 (4.8)	
Completed education level	*n* (%)	*n* (%)	*n* (%)	*p*
Elementary school	4 (1.6)	1 (4.8)	3 (1.3)	0.35
Secondary school	54 (21.8)	4 (19.0)	50 (22.0)	
University/college ≤ 3 years	102 (41.1)	6 (28.6)	96 (42.3)	
University college ≥ 4 years	88 (35.5)	10 (47.6)	78 (34.4)	

Note. Differences between sample subsets analyzed with Mann-Whitney *U*-tests (age) and χ^2-tests (work, studying, and education level).

Table 3

Factor solution of the initial and revised "Being" scale of the N-OWQ, showing factor loadings, communalities, Eigenvalue estimates (λ), reliability estimates (Cronbach's α) and explained variance (n = 248)

Initial scale					**Revised scale**		
Item #	Factor 1	Factor 2	Factor 3	Comm.	Item #	Factor 1	Comm.
26	**0.80**	0.02	0.15	0.65	26	**0.83**	0.69
28	**0.76**	-0.03	0.15	0.58	18	**0.81**	0.66
18	**0.75**	0.25	0.17	0.60	28	**0.76**	0.57
20	**0.69**	-0.17	0.32	0.56	22	**0.64**	0.41
22	**0.61**	0.06	0.30	0.38			
2	**0.46**	0.39	0.17	0.33			
16	-0.01	**0.67**	0.19	0.48			
31	0.06	**-0.67**	0.32	0.59			
32	0.24	**0.54**	0.37	0.41			
6	0.16	0.07	**0.75**	0.57			
3	0.19	0.06	**0.69**	0.48			
8	0.47	0.22	**0.62**	0.50			
λ	3.41	1.44	1.29		λ	2.33	
Cronbach's α	0.77	-0.10	0.56		Cronbach's α	0.76	
Explained variance	28.4 %	12.0 %	10.7 %				
Total explained variance		**51.1 %**			**Total explained variance**	**58.2 %**	

Note. The initial analyses of each of the three original scales helped revise them with a view to which items fit well, and which did not, with the originally proposed concepts (Tables 3-5). Results are derived from the exploratory Principal Component Analysis with Oblimin rotation and Kaiser normalization. Factor loadings are taken from the structure matrix (initial scale) and from the unrotated component matrix (revised scale).

Table 4

Factor solution of the initial and revised "Becoming" scale of the N-OWQ, showing factor loadings, communalities, Eigenvalue estimates (λ), reliability estimates (Cronbach's α) and explained variance (n = 248)

Initial scale				**Revised scale**		
Item #	Factor 1	Factor 2	Comm.	Item #	Factor 1	Comm.
15	**0.87**	0.51	0.75	27	**0.78**	0.61
11	**0.80**	0.46	0.64	23	**0.76**	0.58
30	**0.79**	0.45	0.63	11	**0.72**	0.52
7	**0.76**	0.45	0.58	30	**0.72**	0.51
24	**0.72**	0.36	0.52	4	**0.68**	0.46
27	0.48	**0.83**	0.68			
23	0.50	**0.78**	0.62			
4	0.32	**0.76**	0.60			
19	0.54	**0.71**	0.54			
1	0.43	**0.46**	0.26			
λ	4.70	1.11		λ	2.69	
Cronbachs's α	0.85	0.77		Cronbachs's α	0.78	
Explained variance	47.0 %	11.1 %				
Total explained variance	**58.2 %**			**Total explained variance**	**53.7 %**	

Note. Results are derived from the exploratory Principal Component Analysis with Oblimin rotation and Kaiser normalization. Factor loadings are taken from the structure matrix (initial scale) and from the unrotated component matrix (revised scale).

Table 5

Factor solution of the initial and revised "Belonging" scale of the N-OWQ, showing factor loadings, communalities, Eigenvalue estimates (λ), reliability estimates (Cronbach's α) and explained variance (n = 248)

Initial scale					**Revised scale**			
Item #	Factor 1	Factor 2	Factor 3	Comm.	Item #	Factor 1	Factor 2	Comm.
25	**0.81**	0.29	0.09	0.67	25	**0.83**	0.30	0.71
29	**0.76**	0.32	0.01	0.61	29	**0.79**	0.29	0.63
14	**0.73**	-0.02	0.45	0.68	14	**0.78**	0.03	0.63
12	**0.72**	0.03	0.40	0.62	17	0.23	**0.85**	0.73
21	**0.66**	0.54	-0.20	0.69	9	0.04	**0.80**	0.66
17	0.25	**0.84**	0.11	0.71	13	0.38	**0.72**	0.56
9	0.09	**0.79**	0.08	0.63				
13	0.33	**0.68**	0.20	0.51				
5	0.16	0.11	**0.73**	0.54				
10	0.29	0.38	**0.68**	0.59				
λ	3.50	1.60	1.15		λ	2.50	1.14	
Cronbach's α	0.79	0.70	0.38		Cronbach's α	0.73	0.70	
Explained variance	35.0 %	16.0 %	11.5 %		Explained variance	41.7 %	23.5 %	
Total explained variance		**62.5 %**			**Total explained variance**		**65.2 %**	

Note. Results are derived from the exploratory Principal Component Analysis with Oblimin rotation and Kaiser normalization. Factor loadings are taken from the structure matrix (both scales).

Table 6

Factor solution of the revised N-OWQ 11, with factor loadings, communalities, Eigenvalue estimates (λ), internal consistency (Cronbach's α) and explained variance (n = 248)

Item #	Factor 1	Factor 2	Factor 3	Comm.
23	**0.80**	0.26	-0.38	0.65
27	**0.79**	0.16	-0.32	0.62
4	**0.76**	0.10	-0.14	0.61
28	**0.65**	0.24	-0.41	0.46
22	**0.59**	0.03	-0.31	0.36
17	0.18	**0.86**	-0.25	0.73
9	0.08	**0.80**	-0.04	0.66
13	0.28	**0.71**	-0.36	0.56
25	0.33	0.27	**-0.82**	0.68
29	0.30	0.29	**-0.82**	0.68
14	0.38	0.02	**-0.74**	0.58
λ	3.72	1.64	1.23	
Cronbach's α	0.77	0.70	0.73	
Explained variance	33.8 %	14.9 %	11.2 %	
Total explained variance		**59.9 %**		

Note. The final PCA helped to see that the remaining "being" and "belonging" items (# 23, 27, 4, 28, and 22) should be treated as indicators of the same concept ("self"). The remaining items of the "belonging" scale (# 17, 9, 13, 25, 29, and 14) should be treated as indicators of two separate concepts ("closeness" [# 17, 9, and 13], and "relatedness" [# 25, 29 and 14]). Results derived from the exploratory Principal Component Analysis with Oblimin rotation and Kaiser normalization. Factor loadings are taken from the structure matrix.

Table 7

The revised N-OWQ 11: Items, scoring and relationships to empirically derived scales

Scale	*Things I make time for doing*	*Scoring*
Self		
	22) has no value to me	4-1
	28) is based on my own choices	1-4
	4) contributes to my meeting the expectations of what I am able to do	1-4
	23) contributes to my becoming the person I want to be	1-4
	27) contributes to creating a future that fits with my interests	1-4
Closeness		
	9) keeps me part of my family	1-4
	13) makes me feel that I belong to the places I like	1-4
	17) makes me feel I belong together with the people I am fond of	1-4
Relatedness		
	14) prevents me from having a role in my community	4-1
	25) makes me feel lonely	4-1
	29) prevents me from being where I feel I belong	4-1
Occupational wholeness	All 11 items	

Note. Negatively formulated items are displayed with reversed scoring.