Measurement of Well-Being in Gerontopsychiatric Nursing Home Residents

Citation for published version (APA):

van der Wolf, E., van Hooren, S. A. H., Waterink, W., & Lechner, L. (2018). Measurement of Well-Being in Gerontopsychiatric Nursing Home Residents: Development of the Laurens Well-Being Inventory for Gerontopsychiatry. *Journal of Geriatric Psychiatry and Neurology*, 31(3), 136-148.
<https://doi.org/10.1177/0891988718781031>

DOI:

[10.1177/0891988718781031](https://doi.org/10.1177/0891988718781031)

Document status and date:

Published: 01/05/2018

Document Version:

Publisher's PDF, also known as Version of record

Document license:

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Please check the document version of this publication:

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Measurement of Well-Being in Gerontopsychiatric Nursing Home Residents: Development of the Laurens Well-Being Inventory for Gerontopsychiatry

Journal of Geriatric Psychiatry and Neurology
2018, Vol. 31(3) 136-148
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sagepub.com/journalsPermissions.nav
DOI: 10.1177/0891988718781031
journals.sagepub.com/home/jgp

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Abstract

Background: The gerontopsychiatric population consists of nursing home residents with combined psychiatric and physical disabilities. A validated measure to assess well-being among this population is currently not available. This article is a first step toward the development of a well-being instrument for the gerontopsychiatric population. **Methods:** Potential measurement items were gathered and selected with the help of both gerontopsychiatric residents and care professionals. A total of 295 residents and their primary professional caregivers were interviewed. Theoretical and data-driven considerations were applied in the methodological process of scale construction. **Results:** The final instrument comprised of 30 items within 3 dimensions of well-being (physical, social, and psychological well-being). Reliability and validity were found to be adequate for all dimensions and subscales. **Conclusions:** The Laurens Well-Being Inventory for Gerontopsychiatry measures well-being in gerontopsychiatric nursing home residents. The first results regarding reliability and validity are promising. More research is needed especially to examine test–retest reliability and responsiveness to change.

Keywords

well-being, aging, scale development, psychiatry, long-term care

Introduction

As the aging process progresses, and health, physical functioning, and the number of social contacts may start to decline, retaining a sense of well-being can increasingly become a goal in its own right. In the care for older people, this has been recognized, and over the years well-being or quality of life has become one of the main outcomes in elderly health care and thus a topic of considerable research.¹⁻⁵ There is, however, a substantial and growing group of gerontopsychiatric nursing home residents who have as yet not been so thoroughly studied. This group is characterized by 1 or more chronic psychiatric conditions (not dementia), often combined with 1 or more medical conditions. In a recent systematic review, it was found that, despite the widely recognized importance of well-being in elderly care, only 10 studies on the subject of well-being or quality of life for this specific population were available.⁶ In the 10 studies on well-being in the gerontopsychiatric population, a total of 8 different instruments for the measurement of well-being were used, none of which were validated for the gerontopsychiatric population.

The gerontopsychiatric nursing home population is a heterogeneous group, characterized by both chronic psychiatric

problems and a high prevalence of physical disorders.^{7,8} Due to deinstitutionalization, only the most disabled patients live in a nursing home, where they are dependent on care for the activities of their daily life.⁹ The everyday experiences of this population are influenced by the fact that they live in a residential facility, alongside other psychiatric patients. Despite their relatively young age, the nursing home will likely be their final place of residence; consequently, many gerontopsychiatric patients live in a nursing home for many years.⁷ Also, in

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Received 3/20/2018. Received revised 5/9/2018. Accepted 5/15/2018.

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some cases, a lifetime of dealing with psychiatric illness increases the risk of social isolation or a limited social network.¹⁰ A relatively large number of residents are divorced or have never been married.⁷ Since psychiatric, physical disorders,¹¹ and low functional status¹² among the elderly individuals are negatively associated with well-being, and both high-quality social ties¹³ and marital status¹⁴ are found to be positively associated with well-being, this population is especially susceptible for low well-being. In addition, living in a nursing home may impact on quality of life in a psychiatric population.¹⁵ These vulnerabilities make the study of well-being in this population significant.

It is well documented in the field of gerontopsychiatry that well-being is of major importance, emphasizing the need for developing a well-being instrument that is validated for this specific population. To the best of our knowledge, no valid questionnaire is available for this purpose. One might argue that an instrument that is developed for a psychogeriatric nursing home population could additionally be used for the gerontopsychiatric population. However, the gerontopsychiatric population differs not only in the type of disorder, a disorder that “may shape each domain of quality of life,”¹⁶ but also in demographics and behavior. In general, this population is more often unmarried and exhibits more behavioral problems or psychiatric symptoms such as agitation, delusions, and hallucinations than other nursing home residents.^{7,17}

In such an instrument, the likelihood of cognitive impairment should be accounted for.¹⁷⁻¹⁹ The use of a measurement instrument that is complex, or otherwise cognitively demanding, may lead to low response rates, as we see, for example, in a study of Luzny and Ivanova,²⁰ where the use of the WHOQOL-BREF among a gerontopsychiatric population led to a mere 23.4% response rate. The type of cognitive impairment in this population differs in several aspects from the cognitive problems as seen in nursing home residents with dementia. Memory loss and language problems play a more important role in common forms of dementia,²¹ whereas issues such as concentration problems, difficulties in decision-making, and an impaired ability regarding abstract thinking are more often the main issue in the gerontopsychiatric population.²²⁻²⁴ The instrument should consist of short, concrete, and simple questions and answer scales in order for it to fit the often limited cognitive capacity of the gerontopsychiatric population.

When it comes to content, the instrument should be based on a clearly defined and operationalized concept of well-being or quality of life. Since the concepts are very much similar, the terms “quality of life” and “well-being” are used interchangeably in this study. The World Health Organization (WHO) describes quality of life as subjective, multidimensional, and containing both positive and negative dimensions.²⁵ Following this description, and based on the definition by Diener et al of subjective well-being,^{26,27} we will use the following definition of well-being: *a multidimensional concept that concerns the individuals' cognitive and emotional evaluations of their lives*. According to the WHO, dimensions that should be included at

minimum are the physical, social, and psychological dimension.²⁵ Two models that when used together cover and explicate these dimensions are the social production function (SPF) model^{28,29} (for both the physical and social domains) and Ryff model of psychological well-being^{30,31} (for the psychological domain). A clear definition and operationalization of well-being are important for determining validity of an instrument. Since a definitive “gold standard” is not available, the validity of a well-being instrument should be established using several measures that comply with the working definition. Ideally, an instrument should correlate highly with other self-rated measures of well-being and moderately with observed well-being.^{32,33} In addition, we expect there may be an association with depressive symptoms, since people with depressive symptoms are expected to have lower well-being scores.^{6,34}

A well-designed instrument for the measurement of well-being in gerontopsychiatry can provide a better understanding of well-being in this population and of the factors that are associated with well-being. Also, the opportunity to evaluate well-being might support health-care workers in their provision of care when they aim for a high well-being for this population. The purpose of this study is therefore to develop an interviewer-administered instrument to measure well-being in gerontopsychiatric nursing home residents that take both design- and content-related considerations into account. The aim of this instrument is to be applicable in both further research and in the evaluation of well-being in daily care practice in the nursing home.

Method

To develop a measurement instrument, steps were taken based on both data- and theory-driven decisions. An item pool was generated and a selection was made out of this item pool using a theoretical model. Experienced care professionals were involved in the generation and in the selection of items. Data collection was carried out in several nursing homes in the Netherlands, after which statistical analyses were performed. Decisions on retaining or rejecting items in this process were made using statistical guidelines, but the content of these items was also examined and discussed from a theoretical perspective before a decision was made.

Generation of an Item Pool

In order to gain insight into important aspects of well-being from the residents perspective and to create a first item pool, both residents and health-care professionals were consulted to cover the multiple aspects of well-being. Concepts from the SPF model²⁸ and Ryff model of psychological well-being³⁰ were used to explicate the 3 dimensions. For physical well-being, both comfort and activation were included; for social well-being, the included concepts were affection, behavioral confirmation, and status; and psychological well-being was specified with the concepts: self-acceptance, environmental control, and purpose in life. Ideas and themes for the items

were gathered from 3 groups of people, with central roles in the care for the gerontopsychiatric population. First, semistructured interviews were held with a total of 8 gerontopsychiatric residents. Open-ended questions based on the aforementioned concepts were used, such as “when do you consider your day a good day?” or “what do you do when you want to relax?.” Transcriptions were made, and recurring topics were collected and added to the item pool. Second, a brainstorm session was held with 2 nurses from 2 different nursing homes, both experienced in working with the gerontopsychiatric population. The 3 dimensions of well-being and their subsequent concepts were used as the foundation from which to solicit ideas in all relevant domains of well-being. The nurses were encouraged to name all topics that they considered important for well-being of the residents. The third group who was consulted was a group of 8 health-care practitioners from various disciplines: 2 psychologists, an elderly care physician, 2 physical therapists, an occupational therapist, a pastoral worker, and a social worker, all experienced in working with the gerontopsychiatric population. A brainstorm session was held in a comparable format to the brainstorm with the nurses.

Furthermore, 2 existing well-being instruments, namely, the Social Production Function Instrument for the Level of Well-being³⁵ and the Scales of Psychological Wellbeing,³⁰ were examined to see whether there were still missing themes in the item-pool. Some themes from these instruments were additionally included.

The interviews, brainstorm session, and existing instruments yielded a large number of topics and potential items for the measurement instrument, aiming to produce an item pool broader and more comprehensive than one's own theoretical view of the target construct.³⁶ When overlapping items and themes were removed, a total of over 300 possible items was left within the 3 domains, including items for physical well-being such as “Do you feel physically well?” and “Do you sometimes suffer from nightmares?,” items for social well-being such as “Do you have a close friend within this residence?” or “Do you feel at ease with the nurses?,” and items for psychological well-being such as “Do you feel confident about yourself?” or “Do you feel supported by your faith or belief system?”

Scale Development

A further selection was made by a small focus group, consisting of 2 psychologists, 1 elderly care physician, all experienced in working with the gerontopsychiatric population, and a researcher (the first author). This selection was guided by the following criteria: The items together should cover a broad focus, all dimensions of well-being and their subsequent concepts should be represented in the items, there should be both positively and negatively formulated items, the items should be broadly applicable for residents with different backgrounds or diagnoses, and all items should fit in the general definition of well-being. Items were rephrased by the same focus group into a concise and clear way, using high-frequency words as much

Figure 1. Flowchart showing the procedure of scale development.

as possible, to promote comprehensibility. Also, the time span that the item covered was clearly formulated, for example, “thinking of last week, how often were you anxious or tense?” and “thinking of last week, how often did you enjoy music?” This led to a total of 112 items. For a schematic overview of the scale development process, see Figure 1.

Based on the content of the item, 3 (slightly) different answer scales with 4 answering options were constructed. First “not, sometimes, often, always,” (eg, for items using a structure such as “how often did you enjoy your meal?”); then “not, seldom, sometimes, often” (eg, for items using a structure such as “how often did someone ask you what you wanted?”); and finally “completely disagree, mostly disagree, mostly agree, or completely agree” (eg, for items using a structure such as “there are people around me who have more problems than I do”). All 3 versions of answer scales were printed in very large font for the participants to use during the interview.

Comprehensibility was tested in interviews with 3 gerontopsychiatric residents. An independent research assistant was present during the interviews to observe the process critically and make suggestions for improving comprehensibility.³⁷ This

resulted in improvement in some items by removing ambiguity in items, removing some ambiguous items altogether, and the improvement in instructions for specific questions. After these steps, the interview instrument comprised of 108 items. With the purpose of item reduction, a pilot was performed among 29 gerontopsychiatric participants in 3 different nursing homes. Twenty-five participants answered all the items of the initial questionnaire. Observations that were made during the interviews were used in deciding to reject or retain items, for example, “the question evokes resistance in the resident,” “the item does not resonate with the resident,” “resident had trouble understanding the question,” and so on. Using these observations, suggestions for rejection or maintenance of items were made by the same focus group that formulated the items and, independently, by 2 coauthors (WW and SvH). Differences in the selection were discussed until consensus was reached. Also, the items were categorized according to the 3 theoretical dimensions of well-being. This was done independently by the members of the focus group and 2 coauthors (WW and SvH). Differences in the distribution were discussed by 3 authors (WW, SvH, and EvdW) until consensus was reached.

After this procedure, 56 items were dropped, leaving a questionnaire with 52 items, of which 7 in the dimension of physical well-being, 26 in the dimension of psychological well-being, and 20 in the dimension of social well-being. With this questionnaire, a second pilot was performed among 30 residents. Another evaluation was held with the same focus group and with the coauthors. One item was added, since the theme had come up during the additional interviews: “how often are you being bullied?” This item was added to the social well-being dimension. No other adjustments were made to the measurement instrument.

Participants

A total of 295 residents from 15 locations in the Netherlands participated in this study. Participants were all residents of a gerontopsychiatric nursing home or a gerontopsychiatric ward in a general nursing home. All locations included were high-level care institutions in the Netherlands, aimed at long-term care. Inclusion criteria were having a psychiatric diagnosis, living for at least 1 month in the institution, receiving long-term care (no revalidation or temporary care), and having the cognitive abilities to participate in the interview. Decisions concerning this last criterion were made by the primary professional caregiver or by the researcher during the interview. An exclusion criterion was dementia (other than Korsakov dementia) as a primary diagnosis. There were no age restrictions.

Measures

Demographic information (ie, age and duration of stay in the current location) and information on diagnoses were obtained via the electronic client dossiers. Diagnoses were double checked by the elderly care physician involved in delivering

care. Demographic data on educational level and marital status were requested from the participants themselves.

In order to examine construct validity, 2 instruments for the measurement of well-being were conducted. Cantril ladder,³⁸ a self-rated 1-item measure to establish well-being on a ladder scale, was used. In this ladder, 0 indicates “the worst possible life for you” and 10 indicates “the best possible life for you.” Test-retest reliability was moderate, criterion validity was moderate to strong compared to other self-rated well-being instruments, and moderate when compared to peer ratings of well-being.³⁹ The Qualidem⁴⁰ was used as a validated instrument for proxy-rated quality of life in nursing home residents with dementia. This instrument consists of 37 items such as “is cheerful,” “enjoys the meal,” or “enjoys helping with chores on the ward,” divided into 9 subscales: “care relationship” (7 items, Cronbach α .83), “positive affect” (6 items, Cronbach α .89), “negative affect” (3 items, Cronbach α .71), “restlessness tense behavior” (3 items, Cronbach α .74), “positive self-image” (3 items, Cronbach α .64), “social relations” (6 items, Cronbach α .80), “social isolation” (3 items, Cronbach α .59), “feeling at home” (4 items, Cronbach α .73), and “having something to do” (2 items, Cronbach α .62).⁴⁰

Finally, the Nijmegen Observer-Rated Depression (NORD) scale⁴¹ was used as an additional validation measure, since depression is consistently found to be negatively related to level of well-being.^{34,42,43} The NORD scale is a 5-item instrument administered by the primary professional caregiver. Accuracy is acceptable. For residents without dementia, a cut-off score of >1 showed 100% sensitivity and 69% specificity.⁴¹

Procedures

Residents and their family received written information about the study a few weeks prior to the researcher visiting the institution. If there was an indication that a resident was not sufficiently mentally competent, informed consent from the legal representative of the resident was requested. Before every interview, residents were (again) informed regarding the content and purpose of the study, and written informed consent was given by all participants. This procedure was approved by the research ethics committee of the Open University of the Netherlands.

Following Dalemans et al,³⁷ several measures were taken to meet the needs of more disabled participants to facilitate inclusion of the highest possible percentage of residents. During the interview, there was no time pressure. When the participant seemed tired or lost concentration, a break was inserted or the participant could opt to continue the interview on another day. Visual aid was provided in the form of extra large printed answer scales. Also, hearing problems were accounted for, if necessary, the interviewer spoke loudly or brought a large print version of the questionnaire, sat close to the preferred side of the resident, and checked regularly whether the resident was able to hear what was said. Both observer-rated measures were

administered by the same interviewers to the primary professional caregiver of the participant concerned.

All interviews were performed by the first author or by 1 of 5 research assistants, all trained psychology-master students. Research assistants received a 2.5-hour training, in which all facets of the interview were explained and practiced. In addition, during the first interviews of a research assistant, the first author was present to observe and give feedback regarding the execution of the interviews.

Data Analysis

SPSS version 22 was used for most of the statistical analyses. R version 3.4.2,⁴⁴ package *userfriendlyscience*⁴⁵ was used for calculating confidence intervals (CIs) and the coefficient ω and package *LAVAN*⁴⁶ for confirmatory factor analysis. In the analysis procedure, data-driven and a theory-driven approach was used. Both results from the statistical analyses and the theoretical underpinning of the instrument formed the basis for decisions in constructing the instrument.

First, response distributions of the individual items were examined using histograms for potential imbalance in the response distributions.³⁶ Items in which more than 80% of the respondents would give the same answer would be removed. Missing values were analyzed and treated according to guidelines.^{47,48} The quality of the categorization of the items into the 3 dimensions of well-being was statistically investigated using confirmatory factor analysis.

Unidimensionality. Second, unidimensionality was examined for the 3 dimensions of well-being: physical well-being, social well-being, and psychological well-being and not for general well-being since we did not want to establish unidimensionality of well-being in general, possibly at the cost of the extensiveness of this construct. First, interitem correlations were checked. Items with 33% or more of their inter-item correlations $r < .10$ and items with inter-item correlations $r > .60$ were discussed for removal. This is necessary as unidimensionality is accomplished when interitem correlations are “moderate in magnitude, and cluster closely around the mean value.”³⁶ Then, the corrected item–total correlations were checked, and if items had a corrected item–total correlation $< .30$, they were discussed for potential removal.⁴⁹

Third, the average interitem correlation and McDonald coefficient ω for all 3 dimension of well-being were calculated. The aim was a range of .15 to .50 for the average interitem correlation³⁶ and reliability, as measured with both Cronbach α and McDonald ω , was aimed to be $> .70$.⁵⁰ The last step in establishing unidimensionality was to perform an unrotated factor analysis, where all items should load $> .35$ on the first factor of the dimension in question.³⁶ Items that would load below .35 were discussed for potential removal.

Subscales. To explore the existence of subscales within the 3 dimensions, exploratory factor analyses were performed using principal axis factoring.⁵¹ The type of rotation was chosen

based on the extent of correlation between the factors. The number of subscales was examined via Horn parallel analysis and checked for interpretability, and a cutoff score of .32 was used for interpretation of items in the factors.⁴⁷ In the case of low communalities ($< .30$), or items that would not load $> .32$ on any of the factors, or $> .32$ on more than 1 factor, items would be removed⁵² until all items would load $> .32$ on only 1 of the factors. Then reliability would be estimated for the subscales, aiming at a range of .15 to .50 for the average interitem correlation³⁶ and both Cronbach α and McDonald $\omega > .70$.⁵⁰

Construct validity. First, content validity was assumed to be well addressed in the process of development of the instrument, since generation and selection of items have been compiled by or in consultation with health-care professionals experienced in working with this population. Where possible, the gerontopsychiatric population has also been involved in the generation of items.

Additionally, for criterion-related validity, all subscale scores were hypothesized to be substantially correlated with the score on Cantril ladder. Furthermore, a correlation analysis was conducted with the proxy instrument Qualidem. In general, correlations between self-rated and proxy instruments for well-being are low to moderate^{32,33}; therefore, a weak-to-moderate correlation was hypothesized for the relation between Laurens Well-Being Inventory Gerontopsychiatry (LWIG) and Qualidem outcomes. Finally, as an additional way of assessing validity, the first 126 (42.7%) participants were screened for depressive symptoms using the NORD scale. Participants who met the criteria for depressive symptoms were compared to the participants who did not meet this criterion, using a *t* test, expecting higher well-being scores for the nondepressed group.^{42,43}

Results

Participants

A total of 295 residents with a variety of primary diagnoses were included. Using *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition categorization, the population consisted of 41.2% with schizophrenia spectrum or other psychotic disorders (including 14.3% with a schizoaffective disorder) 12.6% with depressive (or related) disorders, 10.9% with bipolar or related disorders, 11.2% with personality disorders, 12.3% with neurocognitive disorders (6.5% with Korsakov and 5.8% with cerebrovascular accident or acquired brain injury), and 11.9% with other disorders (eg, substance-related disorders, anxiety disorders, or somatic symptom disorders). Age ranged from 38 to 91, with a mean age of 69.3 (standard deviation [SD] 11.19). Overall, 67.1% of the participants were female, and 32.9% were male.

Most (96.5%) participants had completed at least primary education, and 22.5% had also completed vocational training. The largest group (24.6%) finished their middle-level applied education. Higher education was completed by 18.3%, and

7.4% had attained an academic degree. With regard to marital status, a group of 33.9% had never been married, 29.4% were divorced, and 23.2% were widowed. Also, 13.5% of the participants were married or living together. Participants within this last category did not necessarily live together at the time of the interview but did consider themselves in a lasting relationship with a significant other.

The duration of current stay in the nursing home is 3.5 years ($SD = 2.58$) on average, with a range of 1 month to 14 years and 5 months. The distribution of length of stay is positively skewed ($z = 7.38$), with a median of 3.2 years. A total of 513 residents who lived in the included nursing homes fell within the inclusion criteria and had consenting legal representatives. Of these residents, 295 actually completed the interview, a response rate of 57.5%. Reasons for not participating were disinterest, not seeing the relevance or not feeling like participating (28.4%), severe cognitive disorders (22.0%); severe psychiatric symptoms including psychosis, suspiciousness, or anxiety (27.5%); hearing or language problems (8.3%); lack of physical health (7.3%); or unknown reasons (6.5%). Decisions on inability to participate were in some cases made by the primary professional caretaker, in some cases by the interviewer, and in some cases by the residents themselves.

Scale Construction

Response distributions of the 53 individual items were initially examined. No extremely unbalanced items were found. On the item with the strongest imbalance, 68.1% of the participants answered with the same response.

Subsequently, the amount and distribution of missing values were analyzed. In the 53 items, 1 item had 11.9% missing values, which was explained by the fact that this is the item ("how often are you being bullied?") that was added after the first 30 interviews. Of all other values, only 1.4% was missing; however, 27.7% of the cases had at least 1 value missing. Little Missing completely at random test was significant ($=.002$), suggesting that the missing data were missing not at random. According to Tabachnick and Fidell, imputation of missing values is the best solution in case of missing values not at random. Expectation maximization was applied to impute missing values in all 3 dimensions of well-being. This did not change item means or SDs to more than .02.

To study the fit of the proposed 3-dimensional model of well-being, a confirmatory factor analysis was performed. Several goodness-of-fit measures were computed. The $\chi^2 = 2855.90$ with 1322 degrees of freedom. This leads to a relative χ^2 of 2.16. As a "rule of thumb," a relative χ^2 of <2 indicates a good-fitting model.⁴⁷ For the comparative fit index (CFI) and Tucker-Lewis index (TLI), a score of >0.95 is indicative of a good fitting model. The current data show a CFI of 0.688 and TLI of 0.675 which is outside this range. However, scores on the root mean square error of approximation (RMSEA): 0.063 (95% CI, 0.060-0.066) and the standardized root mean square residual (SRMR): 0.077 do fall within the set range for adequate fit, which is <0.08 both for the RMSEA⁵³ and for the

Figure 2. Flowchart showing the methodological steps taken in scale construction.

SRMR.⁵⁴ The outcomes did not show a perfect model; however, the results were sufficiently promising to continue with the current model of well-being. No items were discarded within this step.

Unidimensionality

As a first step toward unidimensionality, the interitem correlation matrices of the dimensions of well-being were checked. Items with more than 33% low interitem correlations ($<.1$) or items with a high interitem correlation ($>.6$) were removed in an iterative process. Following these procedures, 2 items were removed from the dimension of social well-being, 1 item from the dimension of physical well-being, and 5 items from the dimension of psychological well-being. For an overview of the methodological steps that were taken in the process of scale construction, see Figure 2.

For the remaining 45 items, the corrected item-total correlations were checked for each dimension, 1 item within the dimension of social well-being had a corrected item-total

correlation slightly <0.30 ("how often were you bothered by other residents?," $P = .29$). However, the difference with the desired value was small, and, from a theoretical content perspective, the item represented an important part of negative social experience within the social well-being dimension. Therefore, the theory-based consideration that social well-being is a widely scoped construct led to the decision to temporarily retain the mentioned item at least until the step of subscale development. The average interitem correlation at this point was .29, 95% CI: 0.18-0.39, for physical well-being, .25, 95% CI: 0.14-0.35, for social well-being, and .29, 95% CI: 0.18-0.39 for psychological well-being, values that are within the range of 0.15 to 0.50. McDonald ω was $\omega_t = .76$, 95% CI 0.72-0.81 for physical well-being, $\omega_t = .90$, 95% CI: 0.88-0.92, for social well-being, and $\omega_t = .92$, 95% CI: 0.90-0.93, for psychological well-being, which is within the set range.

As a final step in establishing unidimensionality, 3 unrotated factor analyses were performed.³⁶ The item that scored slightly below 0.30 in the item-total correlations and another item that also measured the negative domain of social well-being loaded slightly below .35 in the unrotated factor analysis (ie, "how often were you bothered by other residents?" and "sometimes I am being bullied" with loadings of 0.31 and 0.34, respectively). However, using the same theoretical consideration, both items were temporarily retained. All other items loaded $>.35$ within their subsequent dimension. The instrument at this point consisted of 45 items: 6 in physical well-being, 18 in social well-being, and 21 in psychological well-being.

Subscale Development

To investigate the existence of subscales within the 3 dimensions with factor analysis, first sampling adequacy was verified using the Kaiser-Meyer-Olkin (KMO) measure. For physical well-being KMO = 0.75, for psychological well-being KMO = 0.91, and for social well-being KMO = 0.88, which are all good values, representing adequate sampling (Field, 2009). All KMO values for individual items were >0.72 , which is well above the acceptable level of 0.50 (Field, 2009). For all 3 dimensions, Bartlett test of sphericity was highly significant at $P < .001$, indicating sufficiently high interitem correlations for factor analysis.

To establish whether 1 or more factors were present within the dimensions, Horn parallel analysis was conducted.⁵⁵ For physical well-being, only 1 factor was found, for social well-being, a 3-factor solution appeared to be the best fit, and for psychological well-being, a 2-factor solution was suggested.

Then for both multifactored dimensions, a factor analysis was performed. First, a factor analysis (principal axis factoring) with oblique rotation was requested for the social well-being dimension. Of the 3-factor correlations, 2 were >0.32 indicating that oblique rotation would be a better fit than orthogonal rotation.⁴⁷

In oblique rotation (direct oblimin), the 3-factor solution for social well-being was confirmed, resulting in comprehensible factors in a fairly simple structure. To improve factor structure, all items loading <0.40 on any factor were removed, resulting

Table 1. Pattern Matrix of Social Well-Being.^{a,b}

	Factor		
	1	2	3
There are nurses with whom I have a good relationship	0.717		
There are people with whom I can feel completely at ease	0.524		
How often did you receive sufficient attention?	0.487		
How often did you receive sufficient respect?	0.465		
I see the people who are important to me as often as I would like to	0.464		
There are fellow residents with whom I have good contact	0.424		
How often did you feel that others saw you as a burden?		0.634	
Sometimes I am bullied		0.600	
How often did you feel ignored?		0.537	
How often were you bothered by other residents?		0.491	
How often did you experience a sociable atmosphere when with the other residents?			-0.731
How often did you enjoy the communal mealtimes?			-0.694
How often did you feel you fitted in with the other residents?			-0.641

^aExtraction method: principal axis factoring.

^bRotation method: oblimin with Kaiser normalization.

in the removal of 3 items in an iterative process. After removal of these items, there were no complex items (ie, loading >0.32 on more than 1 factor) in the factor solution. There were, however, still some items with low communalities (<0.30). Communalities represent the proportion of variance in an item that is predicted by the factors that underlie this item.⁴⁷ Items with low communalities were removed iteratively,⁵² resulting in the removal of 2 additional items. After these steps, within the dimension of social well-being, 1 factor contained 6 items, 1 contained 4 items, and 1 consisted of 3 items (see Table 1). Communalities varied from 0.31 to 0.53, and 39.8% of the total variance was explained in this 3-factor solution.

The same process was used for the dimension of psychological well-being. A factor analysis (principal axis factoring) with oblique rotation was used. Both factors correlated strongly $r = -.577$, suggesting oblique rotation as the preferred option.⁴⁷ The 2-factor solution resulted in a reasonably simple and understandable result. Factor structure was improved by removal of the items loading <0.40 on any of the factors, which resulted in the removal of 3 further items. Then items with low communalities (<0.3) were removed iteratively, which resulted in the removal of an additional 5 items. After this step, loadings in the pattern table had changed, and some items now had low or complex loadings. Another 2 items were, therefore, removed. The resulting factors within the dimension of psychological well-being contained 7 and 4 items, respectively (see Table 2). Communalities varied from 0.31 to 0.60, and 41.7% of the total variance could be explained in this 2-factor solution.

Table 2. Pattern Matrix of Psychological Well-Being.^{a,b}

	Factor	
	1	2
How often did you feel anxious or tense?	0.764	
How often did you feel sad or depressed?	0.618	
How often did you feel empty or flat?	0.609	
How often did you feel bored?	0.588	
How often did you worry about the purpose of your life?	0.559	
How often did you feel lonely?	0.513	
How often did you feel relaxed?	0.505	
I am satisfied with how my life has turned out so far		−0.783
I have accomplished what I wanted to in life		−0.739
I think life is meaningful		−0.491
I think I am worth the effort		−0.439

^aExtraction method: principal axis factoring.^bRotation method: oblimin with Kaiser normalization.

Reliability

Reliability of the dimensions and their underlying factors was examined using both the mean inter-item correlation, McDonald ω and Cronbach α . The only subscale that had an $\omega < .7$ was the social well-being subscale of “negative social experiences,” with both an ω and a Cronbach α of .68. (see Table 3). Reliability was acceptable for all other dimensions and factors.

Construct Validity

Correlations among the dimensions and subscales were all significant and varied from $r = .29$ to $r = .66$ (see Table 4). Correlations between total dimension scores and their subscales were left out of the table, since these values are inflated due to a large overlap in items. Table 5 shows the correlations of the LWIG subscales, Cantril ladder and the 9 Qualidem subscales. As expected, the correlations with Cantril ladder are relatively high, as both instruments measure self-rated well-being. Correlations with the Qualidem subscales vary strongly for each subscale. However, all dimensions and subscales had significant correlations with several Qualidem subscales. Correlations were in general weak to moderate.

The third way to establish criterion-related validity was to compare nondepressed and potentially depressed participants based on the NORD scale, a screening instrument for depression. A t test was performed showing significantly lower LWIG scores on all subscales for the group that fell within the criteria for depressive symptoms compared to the nondepressed group (see Table 6).

Discussion

The purpose of this study was to develop an instrument for the measurement of well-being among gerontopsychiatric nursing home residents. This is of significant importance, since the gerontopsychiatric population is a population that is susceptible to low well-being due to several characteristics such as high

prevalence of physical disorders and a high dependence on care for daily life activities.^{9,17} This population differs from other nursing home residents when it comes to, for example, age, marital status,⁷ and type of cognitive disorders.^{17,21,22} Up to now, there is no validated instrument for the measurement of well-being in this population. The availability of a validated instrument to measure well-being may make it possible to aim to achieve well-being as a treatment goal.

We conceptualized the construct of well-being as consisting of 3 dimensions, physical well-being, social well-being, and psychological well-being, and developed the instrument based on contributions from the target population itself and professionals experienced in working with this population. The instrument, now referred to as the LWIG, consists of 30 items within 3 dimensions: physical, social, and psychological well-being, with 0, 3, or 2 subscales, respectively. These subscales are for social well-being: positive social experience, negative social experience, and communal living, and for psychological well-being: affect and self-worth. Sum scores of both the social well-being and the psychological well-being subscales can also be used.

To study the internal structure of the instrument, correlations between dimensions and subscales were evaluated. All dimensions and subscales were found to be intercorrelated. This is in line with the hypothesis that well-being is one construct, although it is broad and consisting of multiple dimensions. The correlations were different in magnitude, there is, for example, a relatively high correlation between the physical and the psychological dimension of well-being, which is mainly due to the “affect” subscale. Also, some of the social well-being subscales correlated relatively highly with the psychological well-being subscales. One explanation could be the influence of overarching factors such as context or personality traits on the different factors of well-being. Optimism, for example, has been shown to positively affect both psychological well-being and not only perceived physical health but also actual physical health.⁵⁶ Also, the amount of social activity is found to be influenced by the personality trait positive affectivity,⁵⁷ which may be comparable to the “affect” subscale of the psychological well-being dimension. Another explanation might be found in the SPF model, which argues that both social and physical well-being together are a source for general (psychological) well-being.^{29,58}

The moderate-to-strong correlations between the LWIG subscales and the established well-being measure Cantril ladder demonstrate validity of the LWIG subscales. Especially noteworthy is the relatively strong correlation between the self-worth subscale and Cantril ladder. This might indicate that a feeling of self-worth is of major importance in establishing a sense of well-being in this population.

Validity of the LWIG was further demonstrated in the relation to symptoms of depression. Depression has a significant negative effect on mood, which also plays a major role in the level of well-being. Also, depression has consistently been shown to be negatively related to well-being.^{6,34} The LWIG demonstrated sensitivity in being able to differentiate between

Table 3. Reliability of Dimensions and Factors (N = 293).

	Mean (SD)	Mean Inter-Item Correlation	McDonald ω	Cronbach α
Physical well-being (6 items)	2.72 (0.69)	.29 (95% CI 0.18-0.39)	.72 (95% CI 0.68-0.77)	.72 (95% CI 0.66-0.77)
Psychological well-being (11 items)	2.88 (0.66)	.33 (95% CI 0.22-0.43)	.84 (95% CI 0.82-0.87)	.84 (95% CI 0.82-0.87)
1: Affect (7 items)	2.84 (0.70)	.37 (95% CI 0.27-0.46)	.80 (95% CI 0.77-0.84)	.80 (95% CI 0.77-0.84)
2: Self-worth (4 items)	2.95 (0.84)	.45 (95% CI 0.35-0.54)	.77 (95% CI 0.73-0.81)	.76 (95% CI 0.72-0.81)
Social well-being (13 items)	2.85 (0.59)	.24 (95% CI 0.13-0.35)	.81 (95% CI 0.78-0.84)	.81 (95% CI 0.77-0.84)
1: Positive social experience (6 items)	3.03 (0.67)	.32 (95% CI 0.21-0.43)	.73 (95% CI 0.68-0.78)	.73 (95% CI 0.68-0.78)
2: Negative social experiences (4 items)	2.95 (0.82)	.35 (95% CI 0.25-0.46)	.68 (95% CI 0.62-0.74)	.68 (95% CI 0.62-0.74)
3: Communal living (3 items)	2.34 (0.92)	.52 (95% CI 0.43-0.60)	.76 (95% CI 0.71-0.81)	.76 (95% CI 0.71-0.81)

Abbreviations: CI, confidence interval; SD, standard deviation.

Table 4. Pearson Correlations Between Dimensions and Subscales.

	Mean (SD)	Physical WB	PsWB	PsWB–Affect	PsWB–Self-Worth	SWB	SWB–Positive	SWB–Negative
Physical WB	2.72 (0.69)							
PsWB	2.88 (0.66)	0.659 ^a						
PsWB–affect	2.84 (0.70)	0.633 ^a						
PsWB–self-worth	2.95 (0.84)	0.501 ^a		0.531 ^a				
SWB	2.85 (0.59)	0.491 ^a	0.551 ^a	0.447 ^a	0.541 ^a			
SWB–positive	3.03 (.67)	0.375 ^a	0.416 ^a	0.285 ^a	0.484 ^a			
SWB–negative	2.95 (0.82)	0.350 ^a	0.406 ^a	0.402 ^a	0.292 ^a		0.317 ^a	
SWB–communal	2.34 (0.92)	0.416 ^a	0.460 ^a	0.362 ^a	0.468 ^a		0.476 ^a	0.366 ^a

Abbreviations: SD, standard deviation; PsWB, psychological well-being; SWB, social well-being.

^aCorrelation is significant at the .01 level (1-tailed).

Table 5. Pearson Correlations Between LWIG Scores and Cantril Ladder and Qualidem Subscales.

	Physical WB	PsWB	PsWB–Affect	PsWB–Self-Worth	SWB	SWB–Positive	SWB–Negative	SWB–Communal Living
Cantril ladder	0.40 ^b	0.64 ^b	0.52 ^b	0.62 ^b	0.53 ^b	0.44 ^b	0.33 ^b	0.45 ^b
Qualidem subscales:								
Care relationship	0.131 ^a	0.002	0.013	−0.015	0.216 ^b	0.192 ^b	0.144 ^b	0.154 ^b
Positive affect	0.336 ^b	0.282 ^b	0.303 ^b	0.166 ^b	0.228 ^b	0.236 ^b	0.118 ^a	0.156 ^b
Negative affect	0.257 ^b	0.269 ^b	0.312 ^b	0.126 ^a	0.156 ^b	0.047	0.208 ^b	0.123 ^a
Restlessness tense behavior	0.046	0.096	0.148 ^b	−0.008	0.003	0.006	0.042	−0.051
Positive self-image	0.386 ^b	0.325 ^b	0.322 ^b	0.232 ^b	0.277 ^b	0.219 ^b	0.231 ^b	0.184 ^b
Social relations	0.204 ^b	0.210 ^b	0.211 ^b	0.145 ^b	0.221 ^b	0.272 ^b	0.069	0.143 ^b
Social isolation	0.100 ^a	0.018	0.055	−0.041	0.176 ^b	0.088	0.258 ^b	0.061
Feeling at home	0.227 ^b	0.195 ^b	0.173 ^b	0.170 ^b	0.277 ^b	0.196 ^b	0.201 ^b	0.256 ^b
Having something to do	0.241 ^b	0.157 ^b	0.227 ^b	0.008	0.041	0.079	0.032	−0.038

Abbreviations: LWIG, Laurens Well-Being Inventory Gerontopsychiatry; PsWB, psychological well-being; SWB, social well-being.

^aSignificance at the .05 level (1-tailed).

^bSignificance at .01 level (1-tailed).

participants who are screened as potentially depressed or as nondepressed. Participants who score >1 on the NORD scale have lower well-being scores on all LWIG subscales.

The LWIG subscales that were expected to be related to Qualidem subscales based on content showed as expected weak-to-moderate correlations. Stronger correlations were found between subscales that are, at face value, similar in content. Both the positive and the negative affect scale of the Qualidem, for example, correlated relatively strongly with the

affect scale of the LWIG. Also, the care relationship, social relations, and social isolations subscale, all social subscales of the Qualidem, correlated relatively strongly with the social well-being dimension of the LWIG. Correlations between observed and self-rated subscales that are related in content are an indication of validity, since it indicates that participants' answers are at least partially influenced by objectively observable factors as observed by their primary professional caregivers. However, considering the weak correlations between

Table 6. *T* Test Well-Being in Depressed or Nondepressed Residents (N = 126).

	Mean LWIG Score NORD ≤ 1, N = 51	Mean LWIG Score NORD > 1, N = 75	<i>t</i>
Physical well-being	2.84	2.59	2.00 ^a
Psychological well-being	3.05	2.70	2.87 ^b
Affect	3.00	2.69	2.41 ^b
Self-worth	3.13	2.71	2.87 ^b
Social well-being	2.83	2.55	2.80 ^b
Positive social experience	3.10	2.80	2.39 ^b
Negative social experience	2.81	2.54	1.80 ^a
Communal living	2.32	2.04	1.76 ^a

Abbreviations: LWIG, Laurens Well-Being Inventory Gerontopsychiatry; NORD, Nijmegen Observer-Rated Depression.

^aSignificance at the .05 level (1-tailed).

^bSignificance at .01 level (1-tailed).

the self-rated and observed scores, the conclusions should be drawn with some caution. This may have partly been caused by the fact that an observational measure for participants with dementia was used, due to unavailability of a gerontopsychiatric well-being measure. The low correlations do not invalidate the new measure but they also do not strongly support it.

Because of the limited length and the expedient number of dimensions and subscales, the LWIG is suitable for use in clinical practice, for example, to get an overview of individual well-being profiles and to get a measure of levels of well-being in a ward or a nursing home. Also, for future research, the instrument is relevant. The instrument is based on input by the gerontopsychiatric population and health-care professionals who work with this population, and it has been found to be sufficiently valid and reliable in this population. Since it measures a time frame of only 1 week, it is expected to be sensitive to change and suitable for the measurement of treatment response. This should, however, be further examined.

Given the strong relation between Cantril ladder and the self-worth subscale in the LWIG, stimulating a sense of self-worth in treatment might be an effective practical implication in the promotion of well-being. It was found that social factors such as trust and reciprocity in resident staff relations and also friendship with and encouragement from fellow residents are related to feelings of self-worth.^{59,60} To improve self-worth, both external resources such as the relation to and the approach by health-care staff and also the training of internal resources, or self-management skills,⁶¹ such as social skills training and interventions that promote positive thoughts on social connectivity, might be studied in relation to feelings of self-worth and well-being in the gerontopsychiatric population.

Strengths and Limitations

Some limitations are to be mentioned in this study. First, a fairly large amount of the population (42.5%) was unable or unwilling to participate in the study, despite the measures that

were taken to include more severely disabled residents. Also, some primary professional caregivers were more protective of their residents than others and restricted the number of residents that could be approached for participation in the study. Desire to participate may also have been limited by the relatively large amount of items that were assessed in the first draft of the instrument. The current, more concise instrument of only 30 items may partly resolve this problem.

The amounts of nonparticipation are common in research with the gerontopsychiatric population^{42,62} and can be a source of bias. Residents who did not participate are expected to be relatively more severely disabled, either physically or mentally, which is likely to negatively influence well-being scores. This may have a negative effect on generalizability of well-being scores. Also, all residents in the gerontopsychiatric population, including the participants in this study, are likely to have cognitive impairments, which may hamper the ability to understand, reason, and make decisions.⁶³ Therefore, the development of an additional observational instrument for the measurement of well-being is important to get a more complete picture of the level of well-being in this population by measuring well-being from different perspectives. For optimal comparability, this observer-rated instrument should be based on the same conceptual framework as the LWIG, and it should be rated by observers with a high-quality relation with the resident.⁶⁴

A second limitation is the fact that a relatively large amount of data were missing. Sometimes participants refused to give an answer to questions, other times they did not know or could not decide on an answer. Since we were working with a relatively fragile population, we did not want to press too hard for an answer. Missing data were imputed, which naturally creates a possibility of small errors. However, comparisons between data with imputed and data with missing data showed that the effects of imputation were very limited, whereas the choice to impute the missing values significantly improved the number of analyzable cases.

Another limitation is the unavailability of a true gold standard for the concept of well-being, although much theoretical and empirical research has been conducted on this concept. We have aimed to compensate for this by the involvement of gerontopsychiatric residents and professional caregivers in the development of the items and by the use of several established measures for validation.

Furthermore, the results in this study are based on single measurements, and test-retest reliability is therefore not measured. Both test-retest reliability and sensitivity to change are essential topics, especially when a true gold standard is not available. These topics should be a priority in further validation of the LWIG in future research.

Finally, the subscale of negative social experience fell just outside the adopted scope with regard to both Cronbach α and McDonald ω . Since the subscale is considered to provide unique and relevant information, it was decided to keep the subscale in its current format. However, in future research,

this subscale might need adjustment or additional items to improve reliability.

The considerable contribution of the target population and health-care professionals experienced in working with the target population in the development of the instrument is an important strength of this study. Another strength is the large number of nursing homes from different parts of the Netherlands that participated. The inclusion of data from many different nursing home settings makes the results more likely to be generalizable to multiple settings.

Conclusion

This study is a first step in the development of a well-being instrument for the gerontopsychiatric nursing home population. To the best of our knowledge, no such instrument exists for this specific population, whereas a substantial proportion of the nursing home population is comprised of gerontopsychiatric residents.¹⁸ This instrument may serve as a stimulation to focus on well-being in research into and care for this population. More research is necessary to further establish the internal structure of the instrument and to examine test–retest reliability and sensitivity to change.

Authors' Note

Data were gathered in several nursing homes in the Netherlands. The work was completed at Laurens, Residential Care Center “The Oude-landse Hof.” Oral presentation at the International Congress of Psychology in Yokohama, Japan, July 27, 2016.

Acknowledgments

The authors thank many who contributed to this study: Dato de Gruijter and Gjalte Jorn Peters for their advice on the statistical procedures; Ann Richardson for checking the English text; the nursing home focus group: Eva Papelard, Hielke de Haan, and Annemarie Zoete, the students who assisted with the interviews; and last but not least all care-givers and participants in the nursing homes who invested their time participating in the interviews.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article: This study was funded by Laurens Rotterdam.

References

1. Brownie S, Nancarrow S. Effects of person-centered care on residents and staff in aged-care facilities: a systematic review. *Clinical Interv Aging*. 2013;8:1-10.
2. Hamers J. *De intramurale ouderenzorg: nieuwe leiders, nieuwe kennis, nieuwe kansen [Intramural Care for Elderly: New Leaders, New Knowledge, New Chances]*. Maastricht: Maastricht University; 2011.
3. Windle G, Hughes D, Linck P, Russell I, Woods B. Is exercise effective in promoting mental well-being in older age? A systematic review. *Aging Ment Health*. 2010;14(6):652-669.
4. Bohlmeijer E, Roemer M, Cuijpers P, Smit F. The effects of reminiscence on psychological well-being in older adults: a meta-analysis. *Aging Ment Health*. 2007;11(3):291-300.
5. Jing W, Willis R, Feng Z. Factors influencing quality of life of elderly people with dementia and care implications: a systematic review. *Arch Gerontol Geriatr*. 2016;66:23-41.
6. Van der Wolf E, Van Hooren SAH, Waterink W, Lechner L. Well-being in elderly long-term care residents with chronic mental disorder: a systematic review. *Aging Ment Health*. 2017(21):1-10.
7. Van den Brink AM, Gerritsen DL, Voshaar RC, Koopmans RT. Residents with mental-physical multimorbidity living in long-term care facilities: prevalence and characteristics. A systematic review. *Int Psychogeriatr*. 2013;25(4):531-548.
8. Woo BK, Daly JW, Allen EC, Jeste DV, Sewell DD. Unrecognized medical disorders in older psychiatric inpatients in a senior behavioral health unit in a university hospital. *J Geriatr Psychiatry Neurol*. 2003;16(2):121-125.
9. Collet J, De Vugt ME, Verhey FRJ, Engelen NJJA, Schols JMGA. Characteristics of double care demanding patients in a mental health care setting and a nursing home setting: results from the SpeCIMeN study. *Aging Ment Health*. 2016(20):1-7.
10. Elisha D, Castle D, Hocking B. Reducing social isolation in people with mental illness: the role of the psychiatrist. *Australas Psychiatry*. 2006;14(3):281-284.
11. Saharinen T, Hintikka J, Niskanen L, et al. Health-related quality of life among subjects with long-term mental symptoms in a population-based sample. *J Psychiatr Ment Health Nurs*. 2010;17(3):260-267.
12. Cummings SM. Predictors of psychological well-being among assisted-living residents. *Health Soc Work*. 2002;27(4):293-302.
13. Pinquart M, Sörensen S. Influences of socioeconomic status, social network, and competence on subjective well-being in later life: a meta-analysis. *Psychol Aging*. 2000;15(2):187-224.
14. Bilgili N, Arpacı F. Quality of life of older adults in Turkey. *Arch Gerontol Geriatr*. 2014;59(2):415-421.
15. Kallert TW, Lisse M, Winiecki P. Comparing the effectiveness of different types of supported housing for patients with chronic schizophrenia. *J Public Health*. 2007;15(1):29-42.
16. Brod M, Stewart AL, Sands L, Walton P. Conceptualization and measurement of quality of life in dementia: the Dementia Quality of Life Instrument (DQoL). *Gerontologist*. 1999;39(1):25-36.
17. Van den Brink AMA, Gerritsen DL, de Valk MM, Voshaar RC, Koopmans RTCM. Characteristics and health conditions of a group of nursing home patients with mental–physical multimorbidity—the MAPPING study. *Int Psychogeriatr*. 2017;29(6):1037-1047.
18. Fullerton CA, McGuire TG, Feng Z, Mor V, Grabowski DC. Trends in mental health admissions to nursing homes, 1999–2005. *Psychiatr Serv*. 2009;60(7):965-971.
19. Friedman JI, Harvey PD, Coleman T, et al. Six-year follow-up study of cognitive and functional status across the lifespan in

- schizophrenia: a comparison with Alzheimer's disease and normal aging. *Am J Psychiatry*. 2001;158(9):1441-1448.
20. Luzny J, Ivanova K. Quality of life in hospitalized seniors with psychiatric disorders (a cross-sectional study from the Kromeriz District, Czech Republic). *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub*. 2009;153(4):315-318.
 21. Jonker C, Verhey F, Slaets J. *Handboek dementie: Laatste inzichten in diagnostiek en behandeling*. Houten: Bohn Stafleu van Loghum; 2010.
 22. Fucetola R, Seidman LJ, Kremen WS, Faraone SV, Goldstein JM, Tsuang MT. Age and neuropsychologic function in schizophrenia: a decline in executive abilities beyond that observed in healthy volunteers. *Biol Psychiatry*. 2000;48(2):137-146.
 23. Berg S, Dellasega C. The use of psychoactive medications and cognitive function in older adults. *J Aging Health*. 1996;8(1):136-149.
 24. Alexopoulos GS, Meyers BS, Young RC, et al. EXecutive dysfunction and long-term outcomes of geriatric depression. *Arch Gen Psychiatry*. 2000;57(3):285-290.
 25. WHOQOL Group. The World Health Organization Quality of Life Assessment (WHOQOL): position paper from the World Health Organization. *Soc Sci Med*. 1995;41(10):1403-1409.
 26. Diener E, Heintzelman SJ, Kushlev K, et al. Findings all psychologists should know from the new science on subjective well-being. *Can Psychol*. 2017;58(2):87.
 27. Diener E, Oishi S, Lucas RE. Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annu Rev Psychol*. 2003;54(1):403-425.
 28. Lindenberg S. The paradox of privatization in consumption. In: Diekmann A, Mitter P, eds. *Paradoxical Effects of Social Behavior: Essays in Honor of Anatol Rapoport*. Heidelberg: Physica-Verlag HD; 1986:297-310.
 29. Ormel J, Lindenberg S, Steverink N, Verbrugge LM. Subjective well-being and social production functions. *Soc Indic Res*. 1999;46(1):61-90.
 30. Ryff CD. Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J Pers Soc Psychol*. 1989;57(6):1069.
 31. Ryff CD, Keyes CLM. The structure of psychological well-being revisited. *J Pers Soc Psychol*. 1995;69(4):719.
 32. Fuh JL, Wang SJ. Assessing quality of life in Taiwanese patients with Alzheimer's disease. *Int J Geriatr Psychiatry*. 2006;21(2):103-107.
 33. Torisson G, Stavenow L, Minthorn L, Londos E. Reliability, validity and clinical correlates of the Quality of Life in Alzheimer's Disease (QoL-AD) scale in medical inpatients. *Health Qual Life Outcomes*. 2016;14:90.
 34. Beekman AT, Penninx BW, Deeg DJ, de Beurs E, Geerlings SW, van Tilburg W. The impact of depression on the well-being, disability and use of services in older adults: a longitudinal perspective. *Acta Psychiatr Scand*. 2002;105(1):20-27.
 35. Nieboer A, Lindenberg S, Boomsma A, Bruggen ACV. Dimensions of well-being and their measurement: the SPF-IL scale. *Soc Indic Res*. 2005;73(3):313-353.
 36. Clark LA, Watson D. Constructing validity: basic issues in objective scale development. *Psycholog Assess*. 1995;7(3):309.
 37. Dalemans R, Wade DT, van den Heuvel WJ, de Witte LP. Facilitating the participation of people with aphasia in research: a description of strategies. *Clin Rehabil*. 2009;23(10):948-959.
 38. Cantril H. *Pattern of Human Concerns*. New Brunswick: Rutgers University Press; 1965.
 39. Larsen RJ, Diener E, Emmons RA. An evaluation of subjective well-being measures. *Soc Indic Res*. 1985;17(1):1-17.
 40. Ettema TP, Dröes RM, de Lange J, Mellenbergh GJ, Ribbe MW. QUALIDEM: development and evaluation of a dementia specific quality of life instrument—validation. *Int J Geriatr Psychiatry*. 2007;22(5):424-430.
 41. Leontjevas R, Gerritsen DL, Vernooij-Dassen MJ, Teerenstra S, Smalbrugge M, Koopmans RT. Nijmegen Observer-Rated Depression scale for detection of depression in nursing home residents. *Int J Geriatr Psychiatry*. 2012;27(10):1036-1044.
 42. Smalbrugge M, Pot AM, Jongenelis L, Gundy CM, Beekman AT, Eefsting JA. The impact of depression and anxiety on well being, disability and use of health care services in nursing home patients. *Int J Geriatr Psychiatry*. 2006;21(4):325-332.
 43. Davison TE, McCabe MP, Knight T, Mellor D. Biopsychosocial factors related to depression in aged care residents. *J Affect Disord*. 2012;142(1-3):290-296.
 44. *R: A Language and Environment for Statistical Computing* [computer program]. Version. Vienna, Austria: R Foundation for Statistical Computing; 2017.
 45. *_userfriendlyscience: Quantitative Analysis Made Accessible_*. [computer program]. Version; 2017.
 46. Rosseel Y. Lavaan: an R package for structural equation modeling and more. Version 0.5–12 (BETA). *J Stat Softw*. 2012;48(2):1-36.
 47. Tabachnick BG, Fidell LS. *Using Multivariate Statistics*. 6th ed. Harlow: Pearson Education; 2014.
 48. Gold MS, Bentler PM. Treatments of missing data: a Monte Carlo comparison of RBHDI, iterative stochastic regression imputation, and expectation-maximization. *Struct Equat Model*. 2000;7(3):319-355.
 49. Field A. *Discovering Statistics Using SPSS*. London: Sage Publications; 2009.
 50. Nunnally JC. *Psychometric Theory*. 2nd ed. New York: McGraw-Hill; 1978.
 51. Widaman KF. Common factor analysis versus principal component analysis: differential bias in representing model parameters? *Multivariate Behav Res*. 1993;28(3):263-311.
 52. Worthington RL, Whittaker TA. Scale development research: a content analysis and recommendations for best practices. *Couns Psychol*. 2006;34(6):806-838.
 53. Browne MW, Cudeck R. Alternative ways of assessing model fit. *Sage Focus Ed*. 1993;154:136-136.
 54. Hu Lt, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: a conventional criteria versus new alternatives. *Struct Equat Model*. 1999;6(1):1-55.
 55. O'Connor BP. SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behav Res Methods Instrum Comput*. 2000;32(3):396-402.
 56. Scheier MF, Carver CS. Effects of optimism on psychological and physical well-being: theoretical overview and empirical update. *Cognit Ther Res*. 1992;16(2):201-228.

57. DeNeve KM, Cooper H. The happy personality: a meta-analysis of 137 personality traits and subjective well-being. *Psychol Bull.* 1998;124(2):197-229.
58. Gerritsen D, Steverink N, Ooms ME, Ribbe MW. Finding a useful conceptual basis for enhancing the quality of life of nursing home residents. *Qual Life Res.* 2004;13(3):611-624.
59. Rijnaard MD, van Hoof J, Janssen BM, et al. The factors influencing the sense of home in nursing homes: a systematic review from the perspective of residents. *J Aging Res.* 2016;2016: 6143645.
60. Carpenter BD. Family, peer, and staff social support in nursing home patients: contributions to psychological well-being. *J Appl Gerontol.* 2002;21(3):275-293.
61. Steverink N, Lindenberg S, Slaets JPJ. How to understand and improve older people's self-management of wellbeing. *Eur J Ageing.* 2005;2(4):235-244.
62. Depla M, de Graaf R, Heeren T. Does supported living in residential homes improve the quality of life and mental stability of older adults with chronic mental disorder? *Am J Geriatr Psychiatry.* 2005;13(2):124-133.
63. Okai D, Owen G, McGuire H, Singh S, Churchill R, Hotopf M. Mental capacity in psychiatric patients. *Br J Psychiatry.* 2007; 191:291-297.
64. Huang HL, Chang MY, Tang JS, Chiu YC, Weng LC. Determinants of the discrepancy in patient-and caregiver-rated quality of life for persons with dementia. *J Clin Nurs.* 2009;18(22):3107-3118.