Validation of a Modified German Version of the Brief Pain Inventory for Use in Nursing Home Residents with Chronic Pain

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Abstract: The Brief Pain Inventory (BPI) has been psychometrically evaluated worldwide in adult patients with cancer-related and chronic pain in several languages, but never in nursing home residents with chronic pain. To address this gap, we evaluated the validity of a modified version of the BPI, the BPI for nursing home residents (BPI-NHR) in individuals who resided in German nursing homes. One analytic sample included 137 nursing home residents (mean age, 83.3 years; SD, 8.0 years) without any missing values. An extended sample also included individuals with previous missing values that were substituted with the personal mean (n = 163; mean age, 83.3 years; SD, 8.3 years). Principal axis factoring with oblimin rotation was used to compute the final 2-factor solution for the substituted sample. These factors explained 71.7% of the variance. Internal consistency was calculated using Cronbach α, and showed excellent results. Concurrent validity was tested using nonparametric correlation analyses of the BPI-NHR with the pain medication scale. The present findings support the reliability and validity of the BPI-NHR for very old nursing home residents. Further evaluation of this measure is needed to examine face validity and the effect of multimorbidity on pain interference with function.

Perspective: In this article we present psychometric properties of the BPI originally developed to assess cancer pain, extended to measure chronic nonmalignant pain in younger and middle-aged patients, and now further developed to measure pain intensity and interference with function among very old nursing home residents. Thus, the BPI-NHR might assist clinicians and researchers interested in assessment of pain intensity and interference in elderly individuals who reside in nursing homes.

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Key words: Brief Pain Inventory for nursing home residents, nursing home, validity.

Pain is a common syndrome in older adults, particularly in nursing home residents (NHR). Pain prevalence among NHR varied from 3.7% to 79.5% worldwide depending on the research methods and data sources used to detect that prevalence rate.[33] In Germany, approximately 50% of NHR are affected by pain.[13] Deficits in pain management were detected in various studies.[13,21] Thus, for clinicians and nurses the assessment of pain intensity and pain interference with function among elderly patients is important for determination of appropriate treatment.

The Brief Pain Inventory (BPI) is a 16-item instrument that is used to assess pain prevalence, location, intensity, and interference with function. The BPI was originally developed in the United States for cancer patients and easily can be administered in a large patient population.[9] Over the past few decades, modified versions of the BPI have been psychometrically evaluated around the world in different languages and cultures.[2,14,18,22,23,31,35,36,39] A validated German version of the BPI has been tested in 109 outpatients with cancer pain and with noncancer-related pain syndromes.[29] Testing in noncancer patients has revealed that the BPI is valid for use in chronic nonmalignant pain populations.[2,34] However, previous validation studies of the BPI were performed in

relatively young and middle-aged patients, without sufficient inclusion of very old individuals (range of mean age, 41.7–63.0 years).[2,14,18,22,23,31,35,36,39] Thus, we cannot assume that the good to excellent reliability and validity for the BPI scales among younger and middle-aged patients are transferrable to very old individuals who reside in nursing homes. The Australian Pain Society[1] suggested the use of the Residents Verbal BPI (RVBPI)—an English language instrument for pain assessment—in care facilities for the aged population. The RVBPI omits the item "normal work" because of instability and a modified version additionally omits the item "average pain" in the intensity scale.[3] The rating scale of the RVBPI is restricted to 4 verbal categories. Thus, the tool provides categorical data that are inappropriate for factor analysis.[3] Moreover, the factor structure and the handling of missing values in the BPI have not previously been tested in very old individuals. This is an important issue because missing data are common in nursing research.

Missing values in former studies with the BPI have been either excluded[18,23] or their handling was not specified.[9,14,31,35,39] However, the simple exclusion of cases with missing values might eliminate a number of study participants and might result in misleading conclusions of the study results. Eliminating missing values is recommended when the pattern of missing data is at random, and mean substitution is only recommended when missing values are completely at random.[24] In 1999, Radbruch and colleagues[29] and in 2002, Klepstad and colleagues[23] recommended finding an algorithm for BPI evaluation when values are missing. A recently published Spanish study handled missing values as recommended by the developers of the BPI.[2] In 2009, the developers recommended using all intensity items to compute an intensity score. For the interference with function score they suggested that the mean can be used if at least 4 of 7 of the items have been completed.[11]

To date, the BPI has not been tested in very old populations. Thus, in the present study we used a sample of very old NHR and aimed to examine whether the simple listwise deletion of cases is coherent or the substitution of missing values in the BPI with an aim to save cases is more appropriate. The second aim was to examine the validity of the BPI in this population of NHR with respect to construct validity, concurrent validity, and reliability.

Methods

Participants and Sample Size

The present study was on the basis of baseline data and was part of a cluster-randomized controlled trial performed in 12 nursing homes in Berlin, Germany, which were each part of the same for-profit chain.[25] NHR were included in our current study if they were 65 years old or older, had no or mild cognitive impairment with a score of ≥18 on the Mini-Mental State Examination (MMSE)[16] and had lived in the nursing home facility ≥3 months. Because the BPI is not suitable for use in cognitively impaired individuals, NHR with substantial

cognitive impairment (MMSE score ≤17) were excluded from this study. A sample including only NHR without missing values (n = 137) was compared with an extended sample including additional NHR with substituted values (n = 163). NHR with more than 1 missing item in each BPI scale were excluded from the data set.

Measures

Pain Measurement

Study nurses assessed the NHR self-report of pain by applying the first 2 questions from the BPI[29] by asking 2 dichotomous questions: "Are you in pain?" and "Are you occasionally in pain?" and by assessment of pain medication use. If any of these aspects indicated pain, the nursing home resident was considered to be affected by pain.[25] In accordance with the National Institutes of Health guidelines, chronic pain was defined as any pain lasting ≥12 weeks.

BPI

The BPI was administered face to face by our study nurses, and comprised questions on pain prevalence, location, intensity, and interference with function. Using a scale ranging from 0 (no pain) to 10 (pain as bad as one can imagine), individuals were asked to rate their pain intensity over the past 24 hours at its worst, least, and average, as well as right now with a sum score ranging from 0 to 40. Individuals were also asked to rate the extent to which their pain interfered with general activity, mood, walking, normal work (both outside the house and housework), relations with others, sleep, and enjoyment of life, on a scale ranging from 0 (does not interfere) to 10 (interferes completely) with a sum score ranging from 0 to 70. The German BPI[29] includes an item "normal work (both outside the house and housework; in German: "Normale Arbeit [sowohl außerhalb und Haushalt], Belastbarkeit")." The pretest results (n = 20) were in agreement with our expectation that this item was not applicable in the present nursing home population. Item modification was on the basis of this finding and the wording "normal work" was removed from the presently used scale and left to inquire about the "the ability to cope, mentally and physically, with daily stressors, events, and activities." This modified version of the BPI (BPI-NHR) was then tested in NHR.

Pain Medication Relieved Pain Scale (PMS)

The administered PMS was a single question: "Did the administered medication contribute to your pain relief?" Answers were given on an ordinal scale, with answers including "no relief at all" (0), "some relief" (1), "sufficient relief" (2), and "total pain relief" (3).[4]

Procedure

The presented study complied with the Declaration of Helsinki, and received ethical approval from the institutional review board (approval number EA2/150/11). The study is registered at the German section of the