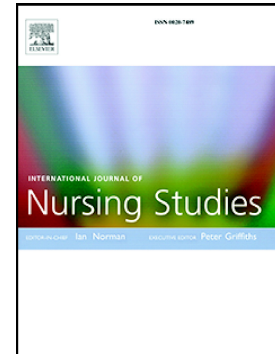


Journal Pre-proof

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Title

Adapting the Geriatric Institutional Assessment Profile for different countries and languages: a multi-language translation and content validation study

Authors

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Abstract:

Background: Hospitalization can be hazardous for older people, but most hospitals in Europe are not prepared to meet the unique needs of older adult inpatients.

Adaptations of the physical environment, care processes, and staff knowledge and skills in geriatric care are essential to improve the quality of care for older people. An assessment of baseline organizational approaches to older adult care is an important first step toward recognizing the challenges organizations face when delivering acute care services to older adults and attempting to improve them. The Geriatric Institutional Assessment Profile could be a promising tool for this endeavor.

Objectives: To describe a systematic process implemented across seven countries and languages that sought to develop valid and culturally-appropriate translations of the Geriatric Institutional Assessment Profile.

Design: Cross-cultural Instrument translation and content validation study.

Setting and Participants: Expert review panels comprised of 68 practicing nurses from seven European or EU associated Countries (Austria (German), Belgium (Dutch), Denmark (Danish), Israel (Hebrew), Poland (Polish), Switzerland (German, French), and Turkey (Turkish)) evaluated cross-cultural relevance, including translation, of the Geriatric Institutional Assessment Profile.

Method: A systematic approach to translating and validating a cross-cultural survey instrument, including back-to-back translation, adaptation, and evaluation of content validity using content validity indexing (CVI) techniques for each country and language, assessing translation and relevance content validity separately. The item, subscale, and domain content validity index scores were calculated and adjusted for

chance agreement among raters for all parts of the Geriatric Institutional Assessment Profile: the four subscales of geriatric care environment, the general knowledge about older adults subscale, and the clinical geriatric knowledge subscale. Consensus discussions amongst the raters then finalized translations.

Results: CVI scores for relevance and translation were all in the “good” to “excellent” range. The geriatric care environment scale’s CVI scores were .84 to .94 for relevance and .82 to .98 for translation. The clinical geriatric knowledge subscale’s CVI scores were .83 to .97 for relevance and .94 to .98 for translation. The general knowledge about older adults subscale received high translation agreement (.93 to .99) but slightly lower scores for relevance, ranging from .46 to .94.

Conclusion: Study results provided preliminary evidence of the applicability and validity of a multi-factor measure of age-friendly care in diverse health care systems, in German, Dutch, Danish, Hebrew, Polish, French, and Turkish languages.

Keywords

Aging; Content Validity Indexing; Cross-Cultural Instrument Adaptation; Geriatric Institutional Assessment Profile; Geriatric Health Services; Nurses Improving Care for Healthsystem Elders; Quality Improvement; Quality of Health Care

What is already known about the topic?

- An organizational assessment should accompany the implementation of age-friendly quality improvement initiatives.
- A structured approach to translating and validating health system organizational survey instruments is required.
- The Geriatric Institutional Assessment Profile is a valid instrument for assessing the provision of care to older people.

What this paper adds:

- Description of a systematic process for translating and evaluating a cross-cultural assessment tool.
- Identification of survey items that may be less suitable in specific cultural and language contexts.
- Preliminary evidence that the Geriatric Institutional Assessment profile may be suitable for countries and languages in which it has not been previously examined.

Introduction

The COVID-19 pandemic has highlighted health system vulnerabilities in every country around the world, especially in the delivery of care for older adults - from primary care through end of life care (Lal et al., 2021). The World Health Organization (WHO) defines older adults as those aged 60 and over. WHO further stratifies them into age cohorts based on common conditions and issues that arise with progressive age, with those over 85 years of age considered “elderly” (World Health Organization, 2021). Even before the pandemic, WHO recognized it was time for health systems to acknowledge the unique care needs of older adults and normal aging processes (World Health Organization, 2004, 2015). The movement was spurred by the aging populations in middle- and high-income countries where citizens are living longer, yet often have chronic illnesses that affect the aging process (Bezerra de Souza et al., 2021; Conde-Sala et al., 2017).

Studies show hospitalization exposes older persons to a broad range of risks, including delirium (Gleason et al., 2015), restrictive measures (de Bellis et al., 2013), injury related falls (Lee et al., 2014), pressure sores due to prolonged immobility in bed, catheter-associated urinary tract infections (Bell et al., 2016), polypharmacy, and other negative outcomes (Conroy et al., 2020; Fazio et al., 2020). Such outcomes lead to repeated and prolonged hospitalization, functional and cognitive decline, decreased quality of life, and increased morbidity and mortality (Karampampa et al., 2016; Khezrian et al., 2020; Parlevliet et al., 2016; Zisberg et al., 2015). While high-quality care tailored to older adults’ needs can reduce or prevent poor hospitalization outcomes (Cacchione, 2020), nurses’ geriatric knowledge has been found insufficient in a number of countries (Burhenn et al., 2016; de Almeida Tavares et al., 2015;

Roethler et al., 2011), and most hospitals are not prepared to meet the unique needs of older adult inpatients (Heydari et al., 2019; Tavares et al., 2021).

Further complicating care delivery to older adults is the issue of ageism: discrimination based on age (Uğurlu et al., 2019). As ageism is a source of health inequities and discrimination, if nurses and other health care providers hold ageist attitudes, this will influence the quality of care older adults receive and their experience of care (Abudu-Birresborn et al., 2019; Morrow-Howell et al., 2020; Periyakoil, 2019; Uğurlu et al., 2019). Attitudes to aging, however, are often complex and contradictory, not easy to change, and poorly explored (Rush et al., 2017). Thus, improving the quality of care for older people is likely to require system-wide changes in the physical environment, care processes, and staff knowledge, skills, and attitudes.

Numerous geriatric practice models, assessment tools, and initiatives have emerged in care settings to guide health care delivery, leadership, and quality enhancement (Capezuti et al., 2012). In the European Union, there have been widespread efforts to improve the quality of hospital settings, but these initiatives have seldom focused on the care of older adults (Busse et al., 2019). Instead, initiatives addressing the processes and outcomes of hospitalization among older adults tend to consider a specific segment or health problem and, as such, are rarely able to improve quality of care for all inpatients over 65.

There are some exceptions, including a UK attempt to create a dementia-friendly hospital environment (Handley et al., 2017). The effort focused on developing a supportive environment for people with dementia. It proposed an assessment tool for hospitals and a set of design principles to support people with cognitive problems to retain their independence (The King's Fund, 2013). Another

hospital-related exception is the creation of acute frailty units (Ribbink et al., 2021), located in or near hospitals in many European countries. These assess, plan treatments for, and treat frail older adult inpatients. The assessment and treatment plan usually involve a multidisciplinary, comprehensive geriatric assessment (CGA). Such programs, however, are highly resource-intensive, and with the increase in the proportion of older adults who are hospitalized, the feasibility of designated specialty geriatric units has been questioned (Flood et al., 2018).

Several models have sufficient evidence of their ability to improve the quality of care of older adults. The US-based Nurses Improving Care for Healthsystem Elders program is a nurse-led initiative targeting critical issues that lead to poor outcomes for hospitalized older adults. It has been recently replicated and implemented in Canada, Bermuda, and Singapore (Squires et al., 2019; Stimpfel & Gilmartin, 2019). A systematic review comparing study results from the program confirmed its effectiveness in reducing falls, pressure injuries, and nosocomial infections and improving the management of delirium (Squires et al., 2021). Other models and assessment tools have been developed and tested in care settings as well. For example, Acute Care for the Elderly (ACE) units aim to prevent functional decline and other harmful sequelae and iatrogenic conditions associated with hospitalization (Deschodt et al., 2018; Malone et al., 2015). Another model is Hospital Elder Life Program (HELP), developed to prevent hospital-associated delirium and functional decline. Results show a significant improvement in hospitalization outcomes, including a decrease in the incidence of falls and delirium-related conditions, along with financial savings to the hospital (Hshieh et al., 2018).

Amongst all the aforementioned approaches, baseline organizational assessments are a common element when taking initial steps to improve the quality of

care. These take both qualitative and quantitative approaches. For example, in a qualitative study drawing on the perspectives of inter-professional stakeholders, Squires et al. (2019) sought to determine the feasibility of adapting the Nurses Improving Care for Healthsystem Elders program to Mexico (Squires et al., 2019). The study identified both structural and resource issues that would affect the translation of the model into that context. A comparable quantitative assessment tool is the Senior-Friendly Hospital self-assessment. It comprises 38 questions in five domains: organizational support; processes of care; emotional and behavioral environment; ethics in clinical care; and research and physical environment. It was developed and tested as a baseline measure prior to incorporating principles modifying hospital care, with initial work completed in Ontario, Canada (Wong et al., 2014) and later adapted for use in Korean and Indian hospitals (Kim et al., 2017).

One of the oldest quantitative assessments is the Geriatric Institutional Assessment Profile developed as part of the Nurses Improving Care for Healthsystem Elders program (Boltz et al., 2009; Kim et al., 2007). The Geriatric Institutional Assessment Profile considers the evidence of high-quality geriatric care practices implemented as part of care delivery and knowledge, as well as organizational factors. It is a combination of questions assessing the environment and process of care and questions assessing nursing knowledge and attitudes (Fulmer et al., 2019). The key component of the Geriatric Institutional Assessment Profile is the emphasis on nursing personnel because in the hospital setting, nurses have the most contact with older adults. The psychometric properties of all Geriatric Institutional Assessment Profile scales show that, in general, it is a valid and reliable tool, with Cronbach's alpha coefficient ranging from .6 to .93 (Boltz et al., 2009; de Almeida Tavares & da Silva, 2013). The Nurses Improving Care for Healthsystem Elders program revises

and updates aspects of the instrument every five years to ensure it aligns with the current best practices in care of older adults.

To the best of our knowledge, with the exceptions of Spanish (Squires et al., 2019) and Brazilian Portuguese translations (Silva et al., 2019), no translations of the Geriatric Institutional Assessment Profile instrument from English to other languages are available. One of the challenges in comparative international studies is to establish that any observed differences are due to real variations in processes and outcomes, not to “noise in measurement methods” (DeVellis, 2016). However, tools translated using our proposed process can significantly reduce measurement errors and allow more valid comparative conclusions to be reached.

As a first step toward developing a standardized international organizational assessment capable of producing comparable results across countries, our international team conducted a systematic translation of the Geriatric Institutional Assessment Profile across seven countries and languages where it had not been previously tested for its reliability and validity. The purpose of this paper is to describe our cross-cultural translation and adaptation process, thus showing how an internationally comparable measure can be created.

Methods

Design

This study followed a cross-cultural instrument translation and adaptation model designed to produce reliable and valid survey instruments across languages and country contexts. The goal was to ensure reliable and valid translations of the Geriatric Institutional Assessment Profile would result from the process.

Cross-Cultural Adaptation Approach

The study replicated the approach described by Squires et al. (2013) in the translation of survey instruments for the European Union RN4CAST study (Sermeus et al., 2011). Countries involved in our collaboration included Austria (German), Belgium (Dutch only), Denmark (Danish), Israel (Hebrew), Poland (Polish), Switzerland (French and German), and Turkey (Turkish). These specific countries collaborated with us because all participants recognized the need to examine and improve the treatment of older adults. In all participating countries, the health care system is facing a growing percentage of elderly persons (50% above age 55 and older) (Eurostat, 2020), but therapeutic systems and approaches have not been developed to meet their needs (Hlavka et al., 2018; Krüsilová, 2016; Osborn et al., 2015; Tavares, 2022). We note that countries included in this sample or group represent a broad range of cultural diversity: from Western European (Germany, Belgium, Denmark, Switzerland) to Eastern European (emerging economies and turbulent cultural changes since the 1990s, e.g., Poland) and Middle Eastern (Turkey, Israel) cultures. Research teams from the countries included nurses, physical therapists, and psychologists, thus representing a diversity of professional expertise.

The Geriatric Institutional Assessment Profile translation process involved three steps and met the requirements for rigorous cross-cultural translation of established instruments. Characteristics of rigorous cross-cultural translations include an evaluation of content, context, conceptual, semantic, and technical equivalence (Squires et al. 2013). The overall methodology included three phases: 1) forward/backward translation by independent professionally certified translators with medical translation experience or bilingual experts in the field; 2) expert feedback to achieve consensus on translations between all participating countries; 3) an expert panel's evaluation of translation quality and content validity and suitability for

measuring the phenomenon of interest in the different organizational health care systems by rating each item for translation adequacy and content validity.

Geriatric Institutional Assessment Profile

The Geriatric Institutional Assessment Profile is a main assessment tool used by Nurses Improving Care for Healthsystem Elders to identify and target clinical practice improvement priorities to advance clinical nursing excellence in the provision of care to older adults. It evaluates an organization's capacity to create systematic change and detect improvement with a pre-and post-intervention assessment. The Geriatric Institutional Assessment Profile is a self-reported assessment survey applicable to health care personnel at diverse clinical settings. It has three major scales and several subscales, each of which measures a domain of the geriatric institutional milieu (Malone et al., 2015). The three major ones are the geriatric care environment scale, the professional issues scale (Boltz et al., 2010), and the geriatric nursing knowledge/attitudes scale (Abraham et al., 1999; Breyspraak & Badura, 2015). The original instrument has undergone a number of adaptations, and we used version 8 of the tool (77 items and 6 subscales). Forty-seven items are rated on a 5-point Likert scale (strongly disagree to strongly agree) and are divided into four subscales: organization values (11 items), resource availability (17 items), age-sensitive care (14 items), and implementation climate (5 items) (Klein et al., 2001). Ten items are rated using a "true," "false" or "do not know" format to assess general knowledge about older adults. Finally, 20 multiple choice items assess nurses' clinical knowledge. These items are based on evidence-based facts and up-to-date geriatric knowledge. They are case-oriented and related to older adults' age-related changes

and risk factors, such as medications, falls, and nutritional balance, use of valid assessment tools, and provision of quality and safe treatment. Each item has only one correct response, with five points for the correct answer. Total score is calculated as the sum of the scores for all responses. Information on the respondent's demographic and professional background is also included (Fulmer et al., 2019).

The Geriatric Institutional Assessment Profile is widely used in the United States and Canada (Capezuti et al., 2012) and shows good internal consistency in previous research, with Cronbach's alpha .6 to .93, as well as stable factorial design (Boltz et al., 2010; Kim et al., 2007). It has been found to be correlated with geriatric knowledge, and significant improvement in the score was demonstrated following the Nurses Improving Care for Healthsystem Elders intervention implementation (Boltz et al., 2008).

Forward and Back Translation

The Geriatric Institutional Assessment Profile translation took place in seven countries where the instrument was translated into seven languages: Austria and Switzerland (German), Belgium (Dutch), Denmark (Danish), Israel (Hebrew), Poland (Polish), Switzerland (French) and Turkey (Turkish).

The forward translation process was conducted by professionally certified translators with medical translation experience (in two countries) or by bilingual experts in health care with at least a master's degree and five years of translation experience (in five countries). The back translation in all countries was done by independent bilingual native speakers or translators who did not have access to the original English version of the tool (Andersen et al., 2014).

Expert Feedback

Once forward and back translations were completed, the team members in each country, together with Nurses Improving Care for Healthsystem Elders representatives, analyzed the two versions for consistency. The Nurses Improving Care for Healthsystem Elders content matter experts made recommendations to each country's team, noting possible ambiguities and necessary modifications. The team refined the translation, based on the feedback, and prepared it for evaluation by expert raters in each country. Back-to-back translations were discussed with the same content experts in the original language, making it possible to identify systematic differences attributable to parallel processes in different cultures. It allowed us to delicately calibrate the item phrasing to reach equivalence between several languages to reflect key concepts, while keeping the concepts parallel.

Expert Panel Review

It is widely recognized that if measures are to be used across cultures, the items must not only be translated well linguistically but also be adapted culturally to maintain the content validity of the instrument at a conceptual level across cultures (Dambi et al., 2018; Fyfe et al., 2003; Sidani et al., 2010; Swami & Barron, 2019). Review by an expert panel consisting of potential users of the tool is a highly recommended technique. It allows in-depth observation and joint examination of the contents of the tool and its suitability for measuring the phenomenon of interest in different organizational cultures and health care systems. Each country's team invited five to 11 bilingual raters (English and native language). Raters were practicing hospital nurses with working experience of their country's health care system. According to Squires et al.'s (2013) methodology, experts should be chosen based on who is the target for the survey as they are the best judges of the relevance of question

content and construct. In this case, nurses were selected as experts because of their knowledge of nursing practice in their countries and settings.

Translated instruments were prepared as Excel spreadsheets, including descriptions of the instruments and their goals, the tasks required from each rater, the instruments' rating scales, and a short demographic questionnaire. All materials were sent to the raters via e-mail with a request to evaluate the translation accuracy/equivalency and relevance of each item to nursing practice in their home country. To provide unbiased results, the experts worked independently on the review and rating of the instrument. The standard four-point content validity indexing (CVI) rating scale was used to evaluate the items for content validity and conceptual relevance (1 = not relevant, 2 = somewhat relevant, 3 = very relevant, 4 = highly relevant) (Almanasreh et al., 2019; Polit & Beck, 2006; Yusoff, 2019). In addition, raters were asked to determine if the original and translated items were semantically and technically equivalent translations through a simple "Yes" or "No" response (Squires et al., 2013). They also had the opportunity to offer suggestions for item improvement (Polit & Beck, 2006). Finally, they were asked to provide basic demographic details and information on their training and professional experience. The entire process was managed online through email and telecommunications.

Data Analysis

Completed files were forwarded to the study hub in Israel where they were merged and analyzed as described below. CVI scores and modified kappa scores were calculated for each item and subscale. The modified kappa statistic adjusted each item's CVI score for chance agreements between raters on relevance, based on the criteria described by Cicchetti and Sparrow (1981) and Fleiss (1981). While the CVI technique is traditionally used for relevancy evaluation, we followed RN4CAST

methodology and applied the same calculation formula to evaluate relevancy and translation separately. The item-level CVI (I-CVI) score was calculated by the number of raters who rated the item as relevant or highly relevant (scores of 3 or 4, respectively), divided by the total number of raters in that country. The mean of all I-CVI item scores in a subscale is represented as an S-CVI (scale-level content validity) score (Polit & Beck, 2006). According to Polit et al. (2007), modified kappa scores of .74 and above are considered “excellent”, and scores between .60 and .73 are considered “good”. All items with an I-CVI score below .74 were inspected by the research team in each country first for translation and cultural accuracy and then for relevancy. Following Squires et al. (2013), we defined an item as a potentially problematic item (PPI) if more than 50% of the raters in that country rated it poorly for relevance (I-CVI score below .59).

Final reports showing items with low translation and CVI scores were presented to each country team. Problematic items were reviewed, revised, and re-evaluated by the raters. When translational problems were identified, the item was adjusted, back-translated, and reevaluated by all raters. Items for which the modified kappa score remained problematic after revision (.59 and less) were further corrected and re-evaluated in order to be included (Squires et al., 2013). They were discussed with two to three representatives from the group of raters and Nurses Improving Care for Healthsystem Elders (experts on cultural adaptation of the tool) and then corrected or modified or left unchanged for further evaluation. This step essentially filled a role similar to that of cognitive interviewing processes used in new instrument development processes (Park et al., 2016; Reeve et al., 2011; Thrasher et al., 2011).

The score for translation at the item level (TI-CVI) was calculated by the number of raters’ positive responses on the quality of item translation, divided by the

total number of raters in that country. The mean TI-CVI was represented as a TS-CVI (translation at the scale level) score. Items with a translation score lower than .74 were reviewed, corrected, and re-evaluated for T-CVI and I-CVI (Squires et al., 2013).

All data were managed and analyzed using SPSS for windows, version 27.0 (IBM Corp. Armonk, NY, USA). A dedicated syntax file was built to merge all the data into a single datasheet and calculate results for each country's tool.

Ethical Issues

Depending on national legislation, the study protocol was approved by either central ethics committees (e.g., national or university) or local ethics committees (e.g., hospitals).

Results

A total of 68 nurses from seven countries served as expert raters for the evaluation process. With one exception (Austria had five raters), each country had a minimum of 7 raters and a maximum of 11. Mean age was 41.2 (± 10), with an average 17 (± 11) years of work experience; 70% had MA or PhD degrees. The majority (65%) worked in hospital settings, mostly in a professional position with older adults (64%) and just over a third (37%) had special geriatric training. Table 1 summarizes the raters' characteristics by country.

Geriatric Care Environment and Professional Issues Subscales

Four Geriatric Institutional Assessment Profile subscales relate to care environment; professional issues and item-level results of the relevance and translation CVIs are presented in Table 2. The average S-CVI for total Geriatric Institutional Assessment Profile score ranged from .84 (Swiss German) to .94 (Polish, Dutch, and Austrian). All subscales' S-CVI scores across all countries had an adequate score (above $>.70$); 97% had S-CVI scores $\geq .80$, and 75% $\geq .90$. The age-

sensitive care subscale received the highest S-CVI score across all countries (average S-CVI=.95), and the organization values subscale had the lowest score (average S-CVI=.86). Four items received lower I-CVI scores from four or more countries (Table 3 shows item scores and corresponding rankings). Three out of four items belonged to the organizational values subscale. The discussion of those items among study participants didn't point out translation problems; rather, we found conceptual differences in the raters' point of view, mostly the existence of intercultural differences in relevant values and behaviors within clinical practice in each country.

TS-CVI scores ranged from .65 (German) to 1.00 (Polish), with 93% scoring $\geq .80$, and 50% $\geq .90$. The implementation climate subscale received the lowest TS-CVI score across all countries (average TS-CVI=.84), and the resource availability subscale received the highest (average TS-CVI=.91). A low TS-CVI score did not necessarily mean the S-CVI score was also low. Four TS-CVI scores were below .80, all of them in the German language, in the same two subscales: age-sensitive care and implementation climate.

On average, across all countries, about 15% of the items fell into the category of PPI and required translational adjustments. A common translational issue was the translation of conceptual nursing terms that are less used in certain countries in our sample. For example, the use of the word "treat" instead of "care" in certain items was discussed in a number of countries and was replaced for clarity by "treatment and care" to cover the broader meaning of the term. Another example was "nursing problems" and "clinical conditions"; these were commonly replaced by "care problems" or "nursing related needs" and "clinical presentations", respectively. Also discussed were "older adults" vs "elderly" and "medication management" vs "medication review". Both required discussion and adjustment. A number of terms

required reconciliation in order to reach semantic equivalence across countries:

“adequate” vs “appropriate”, “hinders” vs “impede”, and “teach” vs “train”.

General Knowledge about Older Adults Subscale

The TS-CVI of the general knowledge about older adults subscale was consistently high across all countries and languages, ranging from .93 to .99, with item scores ranging from .76 to 1.00. However, the S-CVI of the subscale was relatively low, ranging from .46 to .94. Given the recommended cut-off for S-CVI at .74 and above, the scores in the German part of Switzerland (S-CVI=.66) and Austria (German) (S-CVI=.46) point to the relatively low relevance of this scale to nurses' current concept of caring for adults in those countries. The following items received the lowest I-CVI ratings from almost all countries: “Older people are much happier if they are allowed to disengage from society”; “Personality changes with age”.

Clinical Geriatric Knowledge Subscale

The TI-CVI was calculated for each response in addition to the questions themselves for the 20-item multiple choice geriatric knowledge test (four potential responses for each item). The TS-CVI was relatively high across all countries, ranging from .94 in the German part of Switzerland to .98 in Belgium and Turkey (Table 4). The level of PPI items was less than 5%. Similarly, the test's S-CVIs (graded as a single item for the entire question, including its responses) were all within an acceptable range, from .83 in the German part of Switzerland to .97 in Poland (Polish), with item levels ranging from .20 to 1.00. A number of raters in three countries disagreed on the central concept of one question. The question referred to "failure to thrive" as a common geriatric syndrome related to chronic malnutrition among older adults. Even though it is an acceptable nursing diagnosis (Rocchiccioli & Townsend, 2009), in the 10th edition of the International Statistical Classification of

Diseases and Related Health Problems (ICD) and in German and Hebrew-speaking countries, this term is well-known as a pediatric concept. Therefore, it was replaced by “frailty”. Two additional questions were considered problematic in a number of countries either because of the characteristics of patients treated in that country (“When caring for an older adult with darker skin tone, what are the best ways to assess for an early-stage pressure injury?”) or because certain raters were familiar with certain types of knowledge (“Which of the following can clinicians identify using the Beers Criteria?”).

Discussion

To promote EU countries’ transition toward the provision of age-friendly care to a rapidly growing older adult population, we need validated tools to assess the current organizational status and identify areas for improvement. The Nurses Improving Care for Healthsystem Elders’ assessment tool – the Geriatric Institutional Assessment Profile – combines an organizational survey with an attitude and knowledge assessment and, as such, may prove useful in this endeavor. This paper reports a culture- and language-adapted translation process of this potentially useful instrument. We argue that the process of translation into seven languages in eight different systemic and cultural contexts represents a necessary preliminary step in the validation and further testing and implementation of the measure.

Our results yielded promising evidence of the test’s content validity and suggest directions for future studies and applications. Above 90% of all items in the Geriatric Institutional Assessment Profile received a TS-CVI score $\geq .90$. The general knowledge and clinical geriatric knowledge about older adults subscales received TS-CVI scores above .90 across all countries and languages, while the clinical geriatric knowledge subscale reached .97. The translation process included a forward to

backward translation technique, followed by an expert review of discrepancies, and a rating of translation quality by potential survey users. This rigorous process resulted in applicable working versions of the tool in several languages.

The translational issues that emerged from the comparisons of forward to backward translations and the reviews of items receiving low translation grades can be divided into two categories: discrepancies in professional terms and discrepancies in practices expressed by different wording. One example was the use of the words “treat” and “care”. Similar issues appeared for terms such as “nursing problems” vs “clinical conditions”. Squires et al. (2014) noted similar issues in the translation of the Maslach Burnout Inventory - Human Services Survey. These gaps reveal the divide between the concept of a “good translation” and the relevance of a certain concept to a given setting. In other words, terminology reflects cultural assumptions, as well as the organizational and formal reality of care in separate health systems (Davies et al., 2000; Saha et al., 2008). Thus, for example, the general knowledge about older adults subscale had high translation quality indices, but in some country samples, it was considered incongruent with the context of assessing older adult-friendly care.

Additional evidence of the effects of differences in cultural assumptions alongside organizational factors emerged in the patterns of item and instrument CVI ratings across countries. For example, the German raters seemed to be the harshest in judging the measures’ content validity and relevance, while the Polish raters seemed the most positive in rating the measures’ content and face validity. Others have similarly suggested that cultural aspects may bias ratings in a broad range of measurement settings and circumstances (Andersen et al., 2014).

Despite these effects and the need for future studies, our evidence suggests the measure showed more than adequate content validity and relevance, with the exception of a very few items that, at this point, were only flagged for future testing, not excluded from the instrument. Overall, the measure offers a range of indicators and information that may serve as a baseline for organization assessment, both to identify areas requiring improvement and to evaluate intervention efforts in the case of quality improvement initiatives.

Study Limitations

Our study represents a preliminary analysis, a first step toward the validation and implementation of a culturally adapted, rigorously translated measure of older adult-friendly care. Additional steps, such as criterion validation, may be required in various settings to verify the effectiveness of the tool. In addition, our experts came mainly from bedside nurses and academician target populations. A larger representation of older adult community care staff (physicians, physical and occupational therapists etc.) may be useful to generalize the usability of the measure.

Conclusion

For health and care providers to deliver age-friendly care, they need measures that are applicable, practical, and valid to provide baseline data, as well as assessment tools for programs and interventions. To date, very few measures combining organizational aspects of care with knowledge in geriatric care are aimed at all types of care-related staff. This study provides preliminary evidence of the applicability and content validity of a multi-factor measure of age-friendly care, based on ratings by top professionals in each country participating in the study. The process resulted in measure versions that will not only be applicable in different cultures, languages, and

health care settings but will also provide a unified platform for data comparison across nations and settings.

Conflict of interest

None.

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Journal Pre-proof

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Table 1. Characteristics of study population (N=68)

| Country name (language) | Israel (Hebrew) | Poland (Polish) | Switzerland (French) | Belgium (Dutch) | Denmark (Danish) | Turkey (Turkish) | Switzerland (German) | Austria (German) | Total |
|---|---------------------|---------------------|-------------------------|---------------------|----------------------|---------------------|-------------------------|----------------------|----------------------|
| | N=10 | N=9 | N=11 | N=8 | N=7 | N=8 | N=10 | N=5 | N=68 |
| Age, mean±SD, (range) | 38.9±7.4 (30-50) | 38.1±7.9 (27-48) | 36±5.7 (30-47) | 39.6±9.5 (23-50) | 52.7±9.8 (39-65) | 45±6.9 (35-54) | 44.9±12.7 (28-60) | 35.2±13.9 (26-56) | 41.2±10.0 (23-65) |
| Sex, Female, N (%) | 9 (90) | 9 (100) | 7 (70) | 6 (100) | 7 (100) | 8 (100) | 10 (100) | 5 (100) | 61 (91) |
| Education, N (%) | | | | | | | | | |
| RN+BA | 3 (30.0) | 7 (77.8) | 1 (10.0) | 2 (25.0) | 2 (28.6) | 1 (12.5) | 2 (20.0) | 2 (40.0) | 20 (29.8) |
| RN+MA or PhD | 7 (70.0) | 2 (22.2) | 9 (90.0) | 6 (75.0) | 5 (71.4) | 7 (87.5) | 8 (80.0) | 3 (60.0) | 47 (70.2) |
| Geriatric training, N (%) ^a | 4 (40.0) | 2 (22.2) | 7 (70.0) | 2 (25.0) | 2 (28.6) | 3 (37.5) | 3 (30.0) | 2 (40.0) | 25 (37.3) |
| Workplace, N (%) | | | | | | | | | |
| Hospital | 5 (50) | 4 (50) | 9 (90) | 4 (50) | 7 (100) | 2 (25) | 9 (90) | 3 (60) | 43 (65.2) |
| Community | 3 (30) | - | 1 (10) | 1 (12.5) | - | - | - | - | 5 (7.6) |
| Long-term care | 2 (20) | 3 (37.5) | - | 3 (37.5) | - | 1 (12.5) | 1 (10) | 2 (40) | 12 (18.2) |
| Academic | - | 1 (12.5) | - | - | - | 5 (62.5) | - | - | 6 (9.1) |
| Seniority, mean±SD, (range) | 9.4±8.1 (1-25) | 14.2±7.6 (5-25) | 11.5±4.7 (6-23) | 15.2±8.9 (4-25) | 27.7±10.2 (13-41) | 24.6±7.7 (14-35) | 23.6±13.3 (5-42) | 14.7±14.4 (4-36) | 17.3±10.8 (4-42) |
| 50% plus caring for older adults, N (%) ^b | 7 (70) | 5 (55.6) | 7 (70) | 7 (87.5) | 3 (42.9) | 4 (50) | 6 (60) | 4 (80) | 43 (64.2) |
| Leadership position, N (%) | 4 (40) | 3 (33.3) | 7 (70) | 1 (12.5) | 1 (14.3) | 3 (37.5) | 3 (30) | 1 (20) | 23 (34.3) |
| Training position, N (%) ^c | 6 (60) | 9 (100) | 6 (60) | 8 (100) | 6 (85.7) | 8 (100) | 8 (80) | 5 (100) | 56 (83.6) |

^a Dedicated training in geriatrics and gerontology

^b Proportion of time spent caring for (teaching about) older adults

^c Engaged in training employees or students as part of the job (instruction/teaching)

Table 2. S-CVI^k scores for Geriatric Care Environment subscales and total scale

| Country name (language) | Organization Values (N=11) | | Resource Availability (N=17) | | Age-Sensitive Care (N=14) | | Implementation Climate (N=5) | | Total (N=47) | |
|----------------------------|---|---|---|---|---|---|---|---|---|---|
| | S-CVI ^k (I-CVI ^k range) | TS-CVI ^k (TI-CVI ^k range) | S-CVI ^k (I-CVI ^k range) | TS-CVI ^k (TI-CVI ^k range) | S-CVI ^k (I-CVI ^k range) | TS-CVI ^k (TI-CVI ^k range) | S-CVI ^k (I-CVI ^k range) | TS-CVI ^k (TI-CVI ^k range) | S-CVI ^k (I-CVI ^k range) | TS-CVI ^k (TI-CVI ^k range) |
| Israel (Hebrew) | .88 (.66-1.0) | .86 (.50-1.0) | .94 (.79-1.0) | .85 (.50-1.0) | .96 (.90-1.0) | .86 (.66-1.0) | .83 (.79-1.0) | .92 (.79-1.0) | .92 (.66-1.0) | .86 (.50-1.0) |
| Poland (Polish) | .94 (.76-1.0) | .97 (.87-1.0) | .93 (.89-1.0) | .91 (.60-1.0) | .99 (.85-1.0) | .99 (.89-1.0) | .86 (.41-1.0) | 1.00 (1.0-1.0) | .94 (.41-1.0) | .95 (.60-1.0) |
| Switzerland (French) | .88 (.30-1.0) | .85 (.70-1.0) | .93 (.57-1.0) | .83 (.24-1.0) | .95 (.81-1.0) | .84 (.41-1.0) | .96 (.91-1.0) | .76 (.41-1.0) | .93 (.30-1.0) | .83 (.24-1.0) |
| Belgium (Dutch) | .95 (.87-1.0) | .81 (.52-.87) | .94 (.72-1.0) | .94 (.5-1.0) | .95 (.85-1.0) | .82 (.52-1.0) | .88 (.52-1.0) | .84 (.72-.87) | .94 (.52-1.0) | .86 (.31-1.0) |
| Denmark (Danish) | .79 (.41-1.0) | .82 (.15-1.0) | .87 (.66-1.0) | .95 (.66-1.0) | .87 (.41-1.0) | .90 (.66-1.0) | 1.00 (1.0-1.0) | .91 (.85-1.0) | .86 (.41-1.0) | .90 (.15-1.0) |
| Turkey (Turkish) | .93 (.52-1.0) | .99 (.87-1.0) | .87 (.17-1.0) | .98 (.87-1.0) | .98 (.87-1.0) | .97 (.87-1.0) | .89 (.72-1.0) | .92 (.87-1.0) | .92 (.10-1.0) | .98 (.87-1.0) |
| Switzerland (German) | .72 (.25-1.0) | .85 (.50-1.0) | .87 (.66-1.0) | .90 (.41-1.0) | .92 (.66-1.0) | .76 (.50-1.0) | .81 (.34-1.0) | .70 (.25-1.0) | .84 (.25-1.0) | .82 (.25-1.0) |
| Austria (German) | .82 (.42-1.0) | .98 (.76-1.0) | .97 (.42-1.0) | .92 (.42-1.0) | .98 (.76-1.0) | .77 (.42-1.0) | .95 (.76-1.0) | .65 (.20-.76) | .94 (.42-1.0) | .86 (.20-1.0) |

S-CVI = Scale-level content validity index; I-CVI = Item-level content validity index; TS-CVI = Scale-level translation score;

TI-CVI = Item-level translation score

^k modified kappa = Scores are adjusted for chance agreement using modified kappa statistic formula that adjust the I-CVI relevance score for chance agreement.

Table 3. Low average I-CVI^k scores from at least three countries' rating teams

| Items | Israel (Hebrew) | Poland (Polish) | Switzerland (French) | Belgium (Dutch) | Denmark (Danish) | Turkey (Turkish) | Switzerland (German) | Austria (German) |
|---|--------------------|--------------------|-------------------------|--------------------|---------------------|---------------------|-------------------------|---------------------|
| Organization Values | | | | | | | | |
| It is acceptable to disagree with your supervisor regarding care of older adults | .66 | .76 | .70 | - | - | .52 | .34 | - |
| My colleagues value my opinion about proper care of older adult patients | .66 | - | .30 | - | .41 | - | .66 | .42 |
| Input from staff is sought in determining policies and guidelines about older adult patients | - | .76 | .70 | - | .41 | - | .66 | - |
| Implementation Climate | | | | | | | | |
| Staff are encouraged to take time off from their clinical work responsibilities to implement new clinical practices | - | .41 | - | .52 | - | .72 | .34 | - |

I-CVI = Item-level content validity index

^k modified kappa = Scores are adjusted for chance agreement using modified kappa statistic formula that adjust the I-CVI relevance score for chance agreement.

Table 4. CVI^k scores of general knowledge about older adults subscale and clinical geriatric knowledge subscale

| Country name (language) | General knowledge about older adults | | Clinical geriatric knowledge | |
|-------------------------|---|---|--|--|
| | S-CVI ^k (I-CVI ^k Range) (N=10) | TS-CVI ^k (TI-CVI ^k range) (N=10) | S-CVI (I-CVI ^k range) (N=20) | TS-CVI (TI-CVI ^k range) (N=96) |
| Israel (Hebrew) | .94 (.66-1.0) | .97 (.76-1.0) | .94 (.79-1.0) | .97 (.66-1.0) |
| Poland (Polish) | .87 (.60-1.0) | .99 (.89-1.0) | .97 (.85-1.0) | .97 (.72-1.0) |
| Switzerland (French) | .92 (.57-1.0) | .94 (.81-1.0) | .95 (.66-1.0) | .95 (.16-1.0) |
| Belgium (Dutch) | .91 (.52-1.0) | .93 (.85-1.0) | .93 (.52-1.0) | .98 (.31-1.0) |
| Denmark (Danish) | .85 (.66-1.0) | .94 (.85-1.0) | .88 (.71-1.0) | .96 (.41-1.0) |
| Turkey (Turkish) | .93 (.52-1.0) | .99 (.82-1.0) | .94 (.72-1.0) | .98 (.85-1.0) |
| Switzerland (German) | .66 (.34-.79) | .98 (.90-1.0) | .83 (.26-1.0) | .94 (.60-1.0) |
| Austria (German) | .46 (.13-.76) | .93 (.76-1.0) | .86 (.20-1.0) | .95 (.42-1.0) |

S-CVI = Scale-level content validity index; I-CVI = Item-level content validity index; TS-CVI = Scale-level translation score;
TI-CVI = Item-level translation score

^k modified kappa = Scores are adjusted for chance agreement using modified kappa statistic formula that adjust the I-CVI relevance score for chance agreement.

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Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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