Psychometric validation of the Brazilian version of the Geriatric Institutional Assessment Profile

Validação psicométrica da versão brasileira do *Geriatric Institutional Assessment Profile*

Validación psicométrica de la versión brasileña del *Geriatric Institutional Assessment Profile*

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Abstract

Objective: To evaluate the psychometric properties of the Geriatric Institutional Assessment Profile instrument in a sample of Brazilian nurses working in hospitals.

Methods: Methodological and cross-sectional study, carried out with a sample of 301 nurses who worked in the care of patients in five hospitals, located in the states of Piaui and Minas Gerais. Exploratory factor analysis was used with the extraction of factors by the mean components' method. Then, the Varimax rotation was applied. The following correlated constructs were evaluated: geriatric knowledge (Geriatric Nursing Knowledge/Attitudes scale); one that involves institutional barriers and facilitators of best practices (Geriatric Care Environment scale) and another one that emphasizes the interpersonal relationship and coordinating aspects of professional practice (Professional Issues subscales).

Results: Exploratory factor analysis indicated that in the Brazilian version of the Geriatric Nursing Knowledge/Attitudes scale, a total of 30 items had adequate factor loadings (>=0.40) and defined six factors. The total explained variance was 40.5%. In the Geriatric Care Environment scale, 28 items were adequate and defined five factors. The total explained variance was 59.27%. In the Professional Issues subscales, 45 items were adequate and defined six factors. The total explained variance was 57.78%.

Conclusion: The Brazilian version of the Geriatric Institutional Assessment Profile is valid and reliable and can be applied to assess perceptions, attitudes and knowledge about the most common geriatric disorders and identify barriers faced by nurses in the development of quality care.

Resumo

Objetivo: Avaliar as propriedades psicométricas do instrumento *Geriatric Institutional Assessment Profile* em uma amostra de enfermeiros brasileiros que atuam em instituições hospitalares.

Métodos: Estudo metodológico e transversal, realizado em uma amostra de 301 enfermeiros que atuavam na assistência a pacientes de cinco hospitais, localizados nos estados do Piauí e Minas Gerais. Foi utilizada a análise fatorial exploratória com a extração dos fatores pelo método dos componentes principais. Em seguida, aplicou-se a rotação Varimax. Foram avaliados os seguintes constructos correlatos: conhecimento geriátrico (escala Geriatric Nursing Knowledge/Attitudes); um que envolve barreiras institucionais e facilitadores de melhores práticas (escala Geriatric Care Environment) e outro que enfatiza a relação interpessoal e aspectos coordenativos da prática profissional (subescalas Professional Issues).

Resultados: A análise fatorial exploratória indicou que na versão brasileira da escala Geriatric Nursing Knowledge/Attitudes, 30 itens apresentaram cargas fatoriais adequadas (>=0,40) e definiram seis fatores. O total de variância explicada foi de 40,5%. Na escala Geriatric Care Environment, 28 itens foram adequados e

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definiram cinco fatores. O total de variância explicada foi de 59,27%. Nas subescalas Professional Issues, 45 itens foram adequados e definiram seis fatores. O total de variância explicada foi de 57,78%.

Conclusão: A versão brasileira do *Geriatric Institucional Assessment Profile* é válido e confiável e pode ser aplicada para avaliar as percepções, atitudes e conhecimentos acerca de distúrbios geriátricos mais comuns e identificar as barreiras enfrentadas por enfermeiros no desenvolvimento de uma assistência com qualidade.

Resumen

Objetivo: Evaluar las propiedades psicométricas del instrumento *Geriatric Institutional Assessment Profile* en una muestra de enfermeros brasileños que trabajan en instituciones hospitalarias.

Métodos: Estudio metodológico y transversal, realizado en una muestra de 301 enfermeros que trabajaban en la atención a pacientes de cinco hospitales ubicados en los estados de Piauí y Minas Gerais. Se utilizó el análisis factorial exploratorio con la extracción de los factores por el método de los componentes principales. A continuación, se aplicó la rotación Varimax. Se evaluaron los siguientes constructos correlacionados: conocimiento geriátrico (escala Geriatric Nursing Knowledge/Attitudes); uno que incluye barreras institucionales y facilitadores de mejores prácticas (escala Geriatric Care Environment) y otro que enfatiza la relación interpersonal y los aspectos de coordinación de la práctica profesional (subescalas Professional Issues).

Resultados: El análisis factorial exploratorio indicó que, en la versión brasileña de la escala Geriatric Nursing Knowledge/Attitudes, 30 ítems presentaron cargas factoriales adecuadas (>=0,40) y definieron a seis factores. El total de varianza explicada fue del 40,5 %. En la escala Geriatric Care Environment, 28 ítems fueron adecuados y definieron cinco factores. El total de varianza explicada fue del 59,27 %. En las subescalas Professional Issues, 45 ítems fueron adecuados y definieron a seis factores. El total de varianza explicada fue del 57,78 %.

Conclusión: La versión brasileña del *Geriatric Institucional Assessment Profile* es válida y confiable y se puede aplicar para evaluar las percepciones, actitudes y conocimientos sobre los disturbios geriátricos más comunes e identificar las barreras enfrentadas por enfermeros en el desarrollo de una atención de calidad.

Introduction

With the aging of the population, one of the main epidemiological trends is the increase of chronic and degenerative diseases. These conditions require a long period of treatment that leads to an increase in the demand for health services. Thus, the need for long-term care can lead to a decline in the quality of life of older adults, a phenomenon that will pressure health systems to adapt to these ever-changing demands.[1]

In 2018, the Ministry of Health released a study with unpublished data on the aging profile of the population in Brazil. The Longitudinal Study on the Health of the Brazilian Older Adults showed that 75.3% of them depend exclusively on the services provided in the Unified Health System – *Sistema Único de Saúde* (SUS) and, among these, 83.1% had at least one medical consultation in the last 12 months. During this period, it was also identified that 10.2% of the older adults were hospitalized once or more times. Almost 40% of them have a chronic disease, and 29.8% have two or more diseases such as diabetes, hypertension or arthritis.[2]

Older adults require various types and levels of individual care. To provide effective care, it is necessary to create personalized care plans and goals and provide continuous, integrated and interdisciplinary treatment to these individuals. However, there are limited and minimal assessments of health requirements and a lack of evidence-based nursing intervention, which must be based on clinical experience and scientific research to optimally meet the needs and desires of each older adult.[3]

After all, evidence suggests that properly prepared nurses, with better knowledge and skills and positive attitudes towards the older adults improve patient outcomes, with reduced length of stay, readmission rates and satisfaction of the older adults and their families. However, in developing countries, when the demand for nursing care exceeds the supply, care is prioritized according to the acute medical need.[4]

Developed in the light of evidence that hospitals were not prepared to meet the growing number of hospitalized older adults, models of geriatric care were developed with a view to educating health professionals in relation to basic geriatric principles, reducing complications related to infections acquired in the hospital and incorporate the patient and their family into the general care plan.[5]

Thus, in the last three decades, several models have been designed. Among them, the Geriatric Consultation Service, the Acute Care for Older Adult center, the Nurses Improving Care for Health System for the Older Adult (NICHE) initiative, the

Geriatric Resource Nurse model, Senior-Friendly Hospitals, Hospital Older Adult Life Program, the Advanced Practice Nursing Transitional Care and the Care Transition Intervention program. Although these examples have different targets, they all employ age-sensitive and evidence-based interventions by promoting interdisciplinary communication and emphasizing discharge planning.[6]

NICHE is a nurse-led education and consultation program designed to improve the quality of care for older adults in healthcare organizations. So far, there are a total of 580 NICHE program member hospitals in the United States, Singapore, Canada, Mexico, and Bermuda.[7]

Among its set of strategies that collectively help hospitals to substantially change the way they provide this care, the Geriatric Institutional Assessment Profile (GIAP) instrument is included. For this questionnaire, two constructs were used as the original basis for the questions: knowledge of best practices and the environment of best practices.[8]

The process of cultural adaptation of the GIAP instrument to the Brazilian context was developed from 2015 to 2017. The evaluation of the instrument showed good agreement between the judges. At this stage, the semantic, idiomatic, experimental and conceptual equivalences of the GIAP in Brazilian Portuguese were evaluated.[9] We then proceeded to obtain evidence of the validity and reliability of this version of the GIAP through tests on representative samples, composed of different regional groups. Thus, this study aimed to evaluate the psychometric properties of the GIAP instrument in a sample of Brazilian nurses working in hospitals.

Methods

This is a methodological study with cross-sectional data collection and a quantitative approach.

The study was carried out in five hospitals: two located in Belo Horizonte, Minas Gerais and three in Teresina, Piaui. It is important to emphasize that the hospitals in these cities were included because they meet the following criteria: medium and high complexity (acute services, as they have most medical and surgical specialties units) and be characterized as large (large health facilities with greater number of beds, inpatients and nurses per hospital). These characteristics were taken into account in order to ensure a diverse sample of responses.

The instrument was applied to nurses who worked in hospitals, with a minimum time of 12 months. The professionals who worked in specialized medical units, surgical units and intensive care units of hospitals participated in the study. Those who worked in units that mainly assist younger adults or children and nursing managers and supervisors were excluded.

The minimum sampling required must be calculated and identified prior to data collection. The sample size for a factor analysis must be at least five subjects per item or 100 subjects, whichever is greater.[10] In the case of the GIAP, the largest of the three scales has 47 items, which leads to a minimum sample of 235 subjects.

The original GIAP version, provided by NICHE, contains a total of 25 questions that are rated on a 5-point Likert-type response scale. The scales and choices vary depending on the subset of questions (1 = "strongly agree" and 5 = "strongly disagree" / 1 = "slightly dissatisfied" and 5 = "very satisfied"). Higher scores indicate a favorable geriatric practice environment and better knowledge and attitudes of nurses.

To design the sociodemographic profile of the participants, the instrument consists of open and closed questions that allow the collection of data, such as: professional occupation, education, higher degree in a course field other than nursing, years of professional experience, time working in the institution, unit/service they work, sex, age and color.

This is a self-administered instrument, composed of three scales and several subscales: Geriatric Nursing Knowledge / Attitudes Scale; Geriatric Care Environment and Professional Issues.

The GIAP instrument was created from practice protocols developed by experts during the expansion of the NICHE project. The evaluation of the content validity of the Brazilian version of the GIAP showed good adequacy in the opinion of the judges, with a content validity index of 0.94.[9]

The main GIAP scale, Geriatric Nursing Knowlegde/Attitudes Scale, measures knowledge of nursing assessment and management in four common geriatric syndromes: pressure injuries, incontinence, use of restraints and sleep disorders; the second one, Geriatric Care Environment, measures nurses' perception of the geriatric practice environment; and the third one, Professional Issues, measures common professional issues known to influence geriatric nursing practice.

Data collection took place from 2017 to 2018 and was performed by the main researcher. The instrument was applied by filling out a printed form, which was done by the nurses in the hospital units, during every day of the week in the shifts, individually, and invited to participate voluntarily. At this moment, the form with the Brazilian version of the GIAP was delivered. The subjects returned the answered instrument, preferably, after this initial approach.

The sociodemographic profile data were initially summarized using descriptive statistics. The reliability analysis was performed using Cronbach's alpha coefficient, values ≥ 0.70 were adopted as good internal consistency.[11]

To test the construct validity, exploratory factor analysis (EFA) was initially carried out. In this research, the EFA was performed for each of the three GIAP scales. Thirty-five items were used in the first factor analysis. The second analysis involved 28 variables, and the third one included 47 items.

The adequacy of the EFA was tested in order to assess whether the Bartlett sphericity test was significant at the level of 0.05 and the KMO index > 0.70.[12] These observations were elucidated by the scarp scree plot, which orders eigenvalues from largest to smallest. When no rotation is performed, the correlation matrix eigenvalues equal the factor variances.

Factor extraction was performed using the main components method. Then, the Varimax rotation (orthogonal rotation of uncorrelated factors) was applied, in which, for each main component, there are only a few significant weights and all others are close to zero. That is, the objective is to maximize the variation between the weights of each main component, which was defined according to previous (original) exploratory validations considered as the empirical pole of this study.

For this, a minimum factor loading of 0.40 was considered, so that the item could be considered a useful representative of the factor.[13,14] To assess commonality, that is, how much of the variance of each item is explained by each factor generated in the factor analysis, a value > 0.40 was considered satisfactory.[13] Lower values of commonality suggest a small contribution of the item to the model constructed. Therefore, the items should be excluded from the instrument.[15]

In this study, a significance level of 5% was adopted for all statistical tests. The collected data were stored in an electronic data sheet, imported for analysis in the SPSS 19 program.

Before the beginning of the study, consent was obtained from the NICHE coordinator for the use and adaptation of the GIAP to the Brazilian context.

This research was approved by the Research Ethics Committee of the Universidade Federal de Minas Gerais, #555.096 (Certificate of Presentation of Ethical Appreciation: 26459214.0.0000.5149). As it is a sample formed by nurses working in hospital units, the research project was submitted to the ethics committee of the study institutions and received a favorable opinion for its realization.

Results

The sample consisted of 301 nurses, of which 150 were nurses who lived in Teresina and 151 in Belo Horizonte. In total, 73.1% declared to be a specialist in different areas, and 15% had only a bachelor's degree, while 10.3% were a master nurse and 1.0% had a doctor's degree (Table 1). Most respondents were women (83.7%) and 46.5% were mixed race. The mean age was 34 years old (SD: 11 years). Participants had, on average, 10 years of experience in the profession (SD: 6 years), of which about 5 years were spent at the institution (SD: 5.6 years). They worked mainly in intensive care units (23%) and medical/surgical units (23%).

Table 1. Demographic and professional characteristics of the nurses participating in the study

Variables	Study sample (n=301)		
	n(%)	Mean	SD
Age		34	11.31
Gender			
Male	49(16.3)		
Female	252(83.7)		
Race			
White	113(37.5)		
Brown	140(46.5)		
Black	26(8.6)		
Yellow	6(1.99)		
Rather not answer	1(0.3)		
Blank	15(4.98)		
Education			
Bachelor	45(15)		
Specialist	220(73.1)		
Master's degree	31(10.3)		
Doctorate degree	3(1)		
Blank	2(0.6)		
Main unit/service that operates			
General clinic	33(11)		
General surgery	11(3.6)		
Medical/surgical clinic	69(23)		
Emergency	24(8)		
ICU	69(23)		
Coronary unit	31(10)		
Non-critical treatment units	23(7.6)		
Geriatric unit	4(1.3)		
Long-term care unit	10(3)		
Others	27(9)		
Years of experience in the profession		10	6
Years of work at the institution		5	5.6

SD – standard derivation

Psychometric analysis of subscale 1: Better knowledge of practice

The knowledge of practice items in the GIAP comprise questions 18 and 19 of the adapted instrument (both are named: Indicate the degree to which you disagree or agree with the statements), with 35 measurable items, referring to the Geriatric Nursing Knowledge/Attitudes scale.

The results of the quality assessment of the factor analysis showed that the sample size used, according to the estimated parameter, was adequate for the analysis through the measurement of the KMO test of 0.72, considered moderate, as well as the Bartlett's sphericity test was of extreme statistical significance (p=0.00), indicating that the matrix is factorable.[11]

Regarding the commonalities, the items: 18d, 18e, 18f, 18i, 18k, 18n, 18q, 18s, 18v, 19a, 19c, 19d, 19e, 19f, 19h, 19k and 19l showed values lower than 0.4, showing that several factors may be linked to the investigated item. These ranged from 0.188 (18s) to 0.652 (18o).

As for the items of the adapted instrument, there were eleven explained components with eigenvalues greater than 1.00, which express 57.02% of the total variance of the data. However, when considering the original study,[8] which defined six factors as essential to explain the variance of the Geriatric Nursing Knowledge/Attitudes scale, it was decided to carry out the factor analysis according to the assumptions of the empirical pole for the analytical one with a higher variance at 40%. In the work developed, a variance of 40.50% was observed, a result similar to the previously mentioned study, which was 41%.

In the instrument translated and adapted to the Brazilian context, the first factor is responsible for a variance of 11.64%, the second one for 8.98%, the third one for 7.07%, the fourth one for 4.65%, the fifth one for 4.15% and the sixth one by 4.00%.

When applying the varimax rotation, it was observed that, of the 35 items on the scale, five had commonality values lower than 0.40. Thus, items 18e, 18f, 18q, 18s and 18v obtained values lower than 0.4 in at least one of the factors. As a result, 30 items were distributed in the theoretical matrix divided into six factors (Table 1).

The results of the exploratory factor analysis were reviewed and discussed; factors 1, 2, and 4 were kept,[8] while factors 3, 5, and 6 were renamed by the team of authors of this study.

Psychometric analysis of subscale 2: Best practice environment

The GIAP practice environment items comprise questions 10 (title: At the hospital where you work, how satisfied are you), 11 (title: In the decision-making process about older adults' care, the following obstacles are encountered. To what extent does each one interferes in the care in your hospital?) and 17 (title: To what extent do you disagree or agree with these statements about your hospital) of the adapted instrument, with 28 measurable items, referring to the Geriatric Care Environment (GCE) scale.

It is considered that the sample size used according to the estimated parameter was adequate for the

Table 2. Synthesis of the results of the exploratory factor analysis of the Brazilian version of the Geriatric Nursing Knowledge/ Attitudes scale (n = 301)

Item	Factor 1 Principles of good practice (Cronbach's α = 0.401, k = 8)	Component
q18g	The hospital values the time spent on pressure injury prevention.	0.649
q18n	We do a good job of identifying and preventing sleep disorders.	0.584
q18o	Time spent on preventing sleep problems is valued at this hospital.	0.796
q18u	The hospital values time spent managing urinary incontinence without the use of catheters, incontinence clothing, or diapers.	0.701
q19h	I check the restrained older adult at least hourly.	0.425
q19j	In this hospital, all reasonable alternatives are tried before restraining the patient.	0.661
q19k	Doctors, nurses and other professionals need better guidelines to help determine what is appropriate care for older adults.	-0.418
q19m	My opinion on the proper care of older adults is valued by my colleagues.	0.505
Item	**Factor 2 Knowledge - Iatrogenic prevention (Cronbach's α =0.606, k = 5)**	**Component**
q18i	Proper nutrition is the most essential element in preventing skin damage.	0.486
q18j	Sleep problems in hospitalized older adults contribute negatively to hospital outcome.	0.652
q19d	Indwelling urinary catheter is the main cause of septicemia in hospitalized older adults.	0.590
q19f	Nerve damage can result from the use of restraint devices.	0.540
q19g	The use of restraints often contributes to mental confusion in older adults.	0.586
Item	**Factor 3 Knowledge - Frail older adult syndrome (Cronbach's α = 0.588, k = 6)**	**Component**
q18b	Pressure injuries occur in about half of hospitalized older adults.	0.424
q18h	I don't have time to perform daily skin assessments for older adults in my care.	0.665
q18m	Sleep problems must be treated aggressively.	0.485
q18t	Constipation can lead to urinary incontinence.	0.480
q19b	Urinary catheters are suitable for the treatment of incontinence as long as use is stopped after 10 days.	0.539
q19c	Reducing indwelling urinary catheter use creates significant demands on staff time.	0.408
Item	**Factor 4 Knowledge - Pressure Injury (Cronbach's α =0.589, k = 3)**	**Component**
q18a	Most pressure injuries are preventable.	0.735
q18c	It is almost always possible to avoid skin lesions.	0.775
q18d	The calcaneus is one of the areas that are most susceptible to skin breakdown in older adults bedridden patients.	0.511
Item	**Factor 5 Knowledge and Attitudes – Sleep problems and use of sedatives (Cronbach's α =0.578, k = 4)**	**Component**
q18k	Sedatives prevent hallucinations and agitation in older adults with sleep disorders.	0.575
q18l	Most sleep problems in hospitalized older adults require the use of sedatives.	0.693
q18p	Without the help of sedatives, I don't have time to help prevent sleep problems.	0.610
q19i	When the use of mechanical restraints decreases, the use of sedative drugs increases.	0.502
Item	**Factor 6 Inadequate knowledge (Cronbach's α =0.404, k = 4)**	**Component**
q18r	Problems with urinary incontinence are a normal part of aging.	0.619
q19a	We use diapers or geriatric pads overnight for most of our patients.	0.566
q19e	Confused patients are safer when confined to bed or chairs.	0.403
q19l	Many patients prefer to let their caregiver make the decision about which treatment is best.	0.432

factor analysis, through the KMO measure of 0.88, considered excellent, as well as Bartlett's sphericity test proved to be of extreme statistical significance (p=0.000).[12] The commonalities ranged from 0.407 (17b) to 0.695 (11b).

Regarding the items of the instrument, there were six components explained with eigenvalues greater than 1.00, which express 63.14% of the total variance of the data. However, when considering the original research,[8] which defined five essential factors to explain the variance of the GCE scale, it was decided to carry out the factor analysis respecting the assumptions from the empirical to the analytical pole with a superior total variance of the data greater than 40%. In the developed study, it is observed in 59.27%, a similar result to the previously mentioned survey, which was 62.6%.

In the instrument translated and adapted to the Brazilian context, it appears that the first factor is responsible for a variance of 27.54%, the second factor for 15.28%, the third one for 7.90, the fourth one for 4.51 and the fifth one for 4.03.

When applying the varimax rotation, it was observed that no item of the instrument had a commonality value lower than 0.40. As a result, a total of 28 items were distributed in the theoretical matrix divided into five factors (Table 2).

The results of the exploratory factor analysis were reviewed and discussed, and factors 1, 2 and 3 were maintained,[8] while factors 4 and 5 were renamed by the team of authors of this study.

Table 2. Synthesis of the results of the exploratory factor analysis of the Brazilian version of the GCE scale (N = 301)

Item	Fator 1 Princípios de boas práticas (α de Cronbach = 0,401, k = 8)	Componente
q18g	O hospital valoriza o tempo gasto com a prevenção de lesões por pressão.	0.649
q18n	Nós fazemos um bom trabalho identificando e prevenindo desordens do sono.	0.584
q18o	O tempo gasto em prevenção de problemas do sono é valorizado neste hospital.	0.796
q18u	O hospital valoriza o tempo gasto no gerenciamento da incontinência urinária, sem a utilização de cateteres, roupas para incontinência ou fraldas.	0.701
q19h	Eu verifico os idosos contidos pelo menos de hora em hora.	0.425
q19j	Neste hospital, todas as alternativas razoáveis são tentadas antes de conter os idosos.	0.661
q19k	Os médicos, enfermeiros e demais profissionais precisam de melhores diretrizes para ajudar a determinar o que é cuidado apropriado para idosos.	-0.418
q19m	A minha opinião sobre o cuidado adequado dos idosos é valorizada pelos meus colegas.	0.505
Item	**Fator 2 Conhecimento – Prevenção iatrogênica (α de Cronbach =0,606, k = 5)**	**Componente**
q18i	A nutrição adequada é o elemento mais essencial na prevenção de lesões na pele.	0.486
q18j	Problemas do sono em idosos hospitalizados contribuem negativamente para o resultado hospitalar.	0.652
q19d	Cateter vesical de demora é a principal causa de septicemia em idosos hospitalizados.	0.590
q19f	Lesões dos nervos podem resultar do uso de dispositivos de contenção.	0.540
q19g	O uso de contenções com frequência contribui para a confusão mental em idosos.	0.586
Item	**Fator 3 Conhecimento – Síndrome do idoso frágil (α de Cronbach =0,588, k = 6)**	**Componente**
q18b	As lesões por pressão ocorrem em cerca de metade dos idosos hospitalizados.	0.424
q18h	Eu não tenho tempo para realizar avaliações diárias da pele dos idosos sob meus cuidados.	0.665
q18m	Problemas do sono devem ser tratados agressivamente.	0.485
q18t	A constipação pode levar à incontinência urinária.	0.480
q19b	Cateteres urinários são adequados no tratamento da incontinência, desde que o uso seja interrompido após 10 dias.	0.539
q19c	Reduzir o uso de cateter vesical de demora cria demandas significativas sobre o tempo da equipe.	0.408
Item	**Fator 4 Conhecimento – Lesão por pressão (α de Cronbach =0,589, k = 3)**	**Componente**
q18a	A maioria das lesões por pressão é prevenível.	0.735
q18c	Quase sempre é possível evitar as lesões de pele.	0.775
q18d	Os calcâneos são uma das regiões mais susceptíveis à ruptura de pele em pacientes idosos acamados.	0.511
Item	**Fator 5 Conhecimento e Atitudes – Problemas de sono e uso de sedativos (α de Cronbach =0,578, k = 4)**	**Componente**
q18k	Os sedativos evitam alucinações e agitação em idosos com desordens do sono.	0.575
q18l	A maioria dos problemas do sono em idosos hospitalizados requer o uso de sedativos.	0.693
q18p	Sem o auxílio de sedativos eu não tenho tempo para ajudar a prevenir problemas do sono.	0.610
q19i	Quando o uso de contenções mecânicas diminui, o uso de drogas sedativas aumenta.	0.502
Item	**Fator 6 Conhecimento inadequado (α de Cronbach =0,404, k = 4)**	**Componente**
q18r	Os problemas com incontinência urinária são uma parte normal do envelhecimento.	0.619
q19a	Nós usamos fraldas ou absorventes geriátricos durante a noite para a maioria dos nossos idosos.	0.566
q19e	Idosos confusos estão mais seguros quando contidos no leito ou em cadeiras.	0.403
q19l	Muitos idosos preferem deixar seu cuidador tomar a decisão sobre qual é o melhor tratamento.	0.432

*Item with reverse punctuation

Psychometric analysis of subscale 3: Geriatric professional issues

The items on the professional aspects of the GIAP comprise questions 8 (title: How often do disagreements arise between the team (professionals from different areas) about the use of the following treatments?), 9 (title: How often do disagreements arise between the team and the older adults and/or their family about the use of the following treatments?), 12 (title: How often do you use these geriatric services?), 14 (title: How vulnerable or unprotected do you feel in relation to the legal responsibility), 15 (title: Some older adults may present behaviors considered disturbing. How often are they in your care) and 16 (title: To what extent does it bother you when the patient is in your care) of the adapted instrument, referring to the Professional Issues (PI) scale, with 47 measurable items.

The KMO measure was 0.84, considered excellent; Bartlett's sphericity test showed extreme statistical significance (p=0.00).[12] The commonalities ranged from 0.26 (15f) to 0.77 (14d). The questions: 15e, 15f and 16f had values lower than 0.4.

As for the instrument items, there were eleven explained components with eigenvalues greater than 1.00, which expressed 71.44% of the total data variance. However, when considering the original study,[16] which defined six factors as essential to explain the variance of the Geriatric Professional Issues scales, it was decided to carry out the factor analysis respecting the assumptions from the empirical to the analytical pole with a variance greater than 40 %, here observed at 57.78%.

In the instrument translated and adapted to the Brazilian context, the first factor is responsible for a

Table 3. Synthesis of the results of the exploratory factor analysis of the Brazilian version of the PI scales (n=301)

Item	Fator 1 Discordâncias entre funcionários e familiares sobre o uso do tratamento (α de Cronbach = 0,927, k = 10)	Componente
q8a	Restrições mecânicas (por exemplo, faixas para contenção, coletes para contenção, cadeiras geriátricas) *	0,667
q8b	Medicação para dormir ou intervenções químicas (calmantes/ tranquilizantes) *	0,634
q8c	Absorventes para incontinência/dispositivos para incontinência*	0,788
q8d	Vestimentas para incontinência (por exemplo, fralda, roupa íntima para incontinência) *	0,836
q8e	Cateteres urinários (sondas vesicais)*	0,770
q8f	Colchões para alívio de pressão*	0,792
q8g	Dispositivos adaptativos (por exemplo, adaptadores de espuma - encosto conforto triângulo, almofadas, etc -, alarmes de cama) *	0,741
q8h	Medicação para a dor*	0,725
q8i	Alimentação por sonda*	0,716
q8j	Tratamento de lesão por pressão (por exemplo, mudança de posição (decúbito) em idosos acamados) *	0,698
Item	**Fator 2 Discordâncias entre os funcionários sobre o uso do tratamento (α de Cronbach =0,917, k = 10)**	**Componente**
q9a	Restrições mecânicas (por exemplo, faixas para contenção, coletes para contenção, cadeiras geriátricas) *	0,605
q9b	Medicação para dormir ou intervenções químicas (calmantes/ tranquilizantes) *	0,647
q9c	Absorventes para incontinência/dispositivos para incontinência*	0,660
q9d	Vestimentas para incontinência (por exemplo, fralda, roupa íntima para incontinência) *	0,708
q9e	Cateteres urinários (sondas vesicais)*	0,750
q9f	Colchões para alívio de pressão*	0,595
q9g	Dispositivos adaptativos (por exemplo, adaptadores de espuma - encosto conforto triângulo, almofadas, etc -, alarmes de cama) *	0,582
q9h	Medicação para a dor*	0,769
q9i	Alimentação por sonda*	0,774
q9j	Tratamento de lesão por pressão (por exemplo, mudança de posição (decúbito) em idosos acamados) *	0,692
Item	**Fator 3 Carga de comportamentos perturbadores em pacientes idosos (α de Cronbach = 0,852, k = 7)**	**Componente**
q16a	Exigentes	0,832
q16b	Argumentativos/críticos	0,800
q16c	Não cooperativos	0,799
q16d	Procurando garantias / buscando reafirmação/atenção/ auxílio na tomada de decisão/apoio	0,770
q16e	Acordados durante a noite	0,682
q16f	Vagando durante o dia	0,419
q16g	Confusos / agitados	0,749
Item	**Fator 4 Percepção de vulnerabilidade legal (α de Cronbach = 0,898, k = 6)**	**Componente**
q14a	Desenvolvimento de lesões por pressão em idosos	0,783
q14b	Quedas de idosos	0,794
q14c	Acusações por contenções ilegais	0,793
q14d	Lesões decorrentes do uso de dispositivos de retenção	0,870
q14e	Infecção hospitalar relacionada ao uso de cateter	0,765
q14f	Lesões decorrentes do uso de medicação sedativa	0,781
Item	**Fator 5 Uso de serviços geriátricos (α de Cronbach =0,801, k = 7)**	**Componente**
q12a	Enfermeiro especialista em geriatria ou enfermeira geriátrica*	0,645
q12b	Geriatra*	0,614
q12c	Assistente social geriátrica*	0,749
q12d	Psicólogo/ psiquiatra geriátrico*	0,699
q12e	Corridas de leito e serviços internos geriátricos*	0,704
q12f	Textos e revistas geriátricas*	0,675
q12g	Conferências/ workshops geriátricas, regionais ou nacionais*	0,660
Item	**Fator 6 Comportamentos perturbadores percebidos em pacientes idosos (α de Cronbach = 0,780, k = 5)**	**Componente**
q15a	Exigentes	0,814
q15b	Argumentativos/críticos	0,722
q15c	Não cooperativos	0,670
q15d	Procurando garantias / buscando reafirmação/atenção/ auxílio na tomada de decisão/apoio	0,701
q15g	Confusos / agitados	0,595

*Item with reverse punctuation

variance of 21.94%, the second one for 12.03%, the third one for 8.62%, the fourth one for 6.18%, the fifth one for 4.70 % and the sixth one for 4.29%.

When applying the varimax rotation, two of the 47 items of the instrument presented values of commonalities below 0.40. Items 15e and 15f had values lower than 0.4 in at least one of the factors. As a result, 45 items were distributed in the theoretical matrix divided into six factors (Table 3).

The results of the exploratory factor analysis were reviewed and discussed, and all factors were maintained.[16]

Discussion

The Brazilian version of the GIAP is a complex and extensive self-assessment instrument, with differences in response rates, although the average time to complete the questionnaire was 20 minutes. Data collection was carried out through strategies that required time, energy and resources from participants and researchers. For this reason, most studies are carried out in NICHE hospitals (health services that have contracted and applied the NICHE program). The existence of a GIAP database in these hospitals allows the development of retrospective studies, with access to large samples and lower financial cost for the research. On the other hand, the use of GIAP in non-NICHE hospitals requires more effort in the application and data collection.[17]

The first GIAP validation study was carried out in 1999, in a sample of 303 health workers from an academic medical center, where most participants (86.5%) were nurses. With regard to scale fidelity, internal consistency was assessed using Cronbach's Alpha. The Geriatric Nursing Knowledge/Attitudes scale had a value of 0.60[8], similar to the study that validated the GIAP for the Portuguese population (0.65);[18] values even lower than those found in the Brazilian version (0.76) , which presented Alpha very good.

For construct validity, the Geriatric Nursing Knowledge/Attitudes scale, the EFA revealed some problems. Despite the KMO value of 0.72 and Bartlett's sphericity test p< 0.01 demonstrating adequacy to perform the EFA, the factorial model obtained presented as a limitation, a high number of cross-loading. Thus, the six-factor solution proposed by the original study was tested.[8] When analyzing the solution obtained, the total percentage of explained variance was good (40.5%). However, with inadequate Cronbach's Alpha values, which ranged from 0.41 to 0.79 in the factors. Similar results to the study cited,[8] in which the factors explained 41% of the variance, the factor loadings ranged from 0.32 to 0.81 and the KMO was 0.68. In the Portuguese validation,[18] the total percentage of variance was 38%, the Alpha values ranged from 0.1 to 0.5 in the factors, and the KMO was 0.74.

From the theoretical point of view (content), four factors (principles of good practices; knowledge – iatrogenic prevention; knowledge – pressure injury; inadequate knowledge) showed coherence and continuity to the original factor model. However, it included some items related to other factors. The factor "knowledge – frail older adult syndrome" presented a factor solution that, from a theoretical point of view, is illogical and divergent from the original study.[8] These results allude to the need to review the items of this scale in order to improve its construct validity. Despite these considerations, the results obtained may be relevant for practice, as they make it possible to assess the level of knowledge and attitudes of nurses in caring for hospitalized older adults.

In short, the items on this scale adapted to the Brazilian context confirmed the a priori structure of the original instrument. Most items belonged to the geriatric clinical areas of restraint use, treatment of urinary incontinence, sleep problems, and prevention and treatment of pressure injuries.

In the Brazilian GCE scale, Cronbach's alpha value (0.75) indicated good internal consistency, a lower number than that reported in the survey that validated the GIAP in a sample of 9400 nurses (0.93),[19] and applied between 1999 and 2004 and in the Portuguese study (0.91).[20] Despite the differences, Cronbach's Alpha values > 0.7 are considered adequate for comparison between groups.[21] This result ensures that the use of this scale in the Brazilian context is credible, valid and reliable.

For construct validity, the GCE scale revealed KMO values of 0.88 and Bartlett's sphericity test p< 0.01, adequate to perform the EFA. The total percentage of explained variance was good (59.27%), the factor loadings ranged from 0.41 to 0.81. In the original study,[8] the EFA emerged with five factors that explained 62.65% of the variance, and loads from 0.32 to 0.81 and KMOI of 0.68. In 2007, the factor structure of this scale was explored again,[19] four factors were extracted that accounted for 54.68% of the total variance. Factor loadings ranged from 0.33 to 0.83, and the KMOI was 0.93. In the Portuguese validation,[20] the total reported variance was 48.09%, and 4 factors.

In this study, the GCE scale included five factors, with some differences when compared to the validation of the original scale.[19] In the adapted instrument, the item "you may disagree with your supervisor regarding care for older adults" formed the factor lack of professional autonomy (factor 5), in the original version this item had a low value (0.33)

Another difference was the reconfiguration of factors such as the extraction of the "collaboration capacity" factor. Items in this subscale were included in "availability of resources" (factor 1). The nurses in the study understood these items, referring to common geriatric problems, as a resource for the care of older adults patients.

In addition, a new subscale emerged in the factorial model obtained, "team care" (factor 4). Given the high proportion of hospitalized patients, organizations face an imperative to support evidence-based care for older adults and create friendly environments for this age group.[17]

The factor with the greatest percentage variation is the resource availability subscale. This result can be explained by the fact that Brazilian hospitals lack resources, specialized equipment and services for older adults, such as a multidisciplinary geriatric team, early mobilization and participation in functional activities, acute care units for older adults, among others. The subscales "provision of sensitive care to aging" (factor 2) and "institutional values related to the older adults and employees" (factor 3), adapted version, the items are the same that composed the factors of the 2007 study.[19]

In the Brazilian PI geriatric scale, the alpha value ($\alpha = 0.89$) indicated good or very good internal consistency. This result is similar to that reported in a study that analyzed the PI scales of the GIAP in a sample of 2211 nurses (0.90),[16] and to the Portuguese validation survey (0.86).[22]

A 6-factor model was obtained from the EFA, in line with the results reported by the original study.[16] However, the number of items in the Brazilian version is 45, while in the original version it is 47. The two items (awake during night and wandering during the day) were eliminated from the subscale "disturbing behaviors perceived in older adult patients". A possible explanation is the practice of restraint in hospitalized older adults. This technique is often agreed upon, as an aid in the care provided to the patient, in order to control agitation, make it impossible to remove probes, drains and catheters and supposedly prevent falls. It is considered that restraint, whether physical, mechanical, pharmacological/chemical and environmental, is present in care settings for older adults as a common or singular practice.[23]

The research has some limitations. There is a possibility that test conditions (interruptions, physical conditions) in individual configurations, which were unknown, could have influenced the results. Self-completed surveys can bias participants' responses, for example, more dissatisfied nurses may be more likely to respond negatively to the GIAP. In addition, the workload may have influenced some outcomes for those who felt challenged by the time commitment.

The sample was limited to professionals working in public and philanthropic hospitals. Therefore, the results are not spreadable to other types of hospitals. In addition, the convenience sample can make this generalization difficult. The influence of hospital characteristics and nurse demographics, as well as unit type, on the factor structure of GIAP items is an area for further investigation.

In addition, although the Brazilian version of the GIAP has evidence of psychometric validity based on the internal structure, it is necessary to carry out a confirmatory factor analysis in a next validation step.

As for the advancement of scientific knowledge for the area of health and nursing, the GIAP Brazilian version will make the obtaining of objective data from the nursing professional easier, by favoring the identification of geriatric practices and knowledge that can guide the planning of specific interventions, such as multidisciplinary team development, nursing models and policy updates. In addition, the information collected can support scientific and constructive discussions about care planning, and allow future studies to evaluate and compare hospital care for older adults.

Conclusion

The GIAP factor structure provides a profile of the main domains in nursing practice. The results adequately support that the 121 items evaluated in this study produce distinct factors associated with geriatric knowledge and attitudes and environmental and professional issues and, therefore, they are valid. Thus, the psychometric analysis of the GIAP confirmed the suitability of its adaptation for use with Brazilian nurses, by demonstrating that its indicators are a reliable measure, with satisfactory reliability for all scales.

Collaborations

Beleza CMF, Reis IA, Freitas FFQ and Soares SM contributed to the project design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and approval of the final version to be published.

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