INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN MULTIDISCIPLINARY EDUCATION
ISSN(print): 2833-4515, ISSN(online): 2833-4531
Volume 03 Issue 10 October 2024
DOI: 10.58806/ijirme.2024.v3i10n09, Impact factor- 5.138
Page No. 1643 - 1657

Evidence of Psychometric Properties of The Informal Primary Family Caregiver Self-Care Capacity Scale

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ABSTRACT:
Objective: to analyze the psychometric properties of the Informal Primary Family Caregiver Self-Care Capacity Scale. **Methodology**: this is a methodological, descriptive, and analytical study, with a sample consisting of 151 informal primary family caregivers from various cities in southern Minas Gerais. The sample was non-probabilistic by convenience. Instruments used: Sociodemographic and health characterization of informal primary family caregivers and the Informal family caregiver self-care capacity scale. This study was approved by the Research Ethics Committee under No. 5.131.517. **Results**: After exploratory factor analysis, the scale consisted of 22 items and six domains with a Cronbach's alpha above 0.788 for domains 1, 2, 3, 6, and the full scale, and 0.6 for domains 4 and 5. In terms of discriminant validity, the Caregiver Self-Care Capacity Scale was classified in the following domains: 1- Personal care; 4- Social aspects and 6- Religiosity and Spirituality with Education; 6- Religiosity and Spirituality with Time spent as a caregiver and 4- Social aspects with the Reason for being a caregiver. The associations were positive and significant (p=<0.05). **Conclusion**: the Scale showed adequate psychometric properties for use in the Brazilian setting, both in research and in care.

KEYWORDS: Self-care; Caregivers; Validation study; Factor analysis.

INTRODUCTION

Due to the tendency towards demographic transition worldwide, there have been several advances in this process. However, the impacts of this evolution warrant closer attention, as many of the effects of these changes have a direct impact on people's daily lives. Due to the lifestyle (work routines, inadequate diet, etc.) that most of the population have been following, the number of chronic non-communicable diseases is growing (Silocchi; Junges, 2017).

Chronic non-communicable diseases (CNCDs) are defined as a group of permanent illnesses that are usually the result of various factors, especially external ones. According to the World Health Organization (WHO), CNCDs include cardiovascular diseases, chronic respiratory diseases, types of cancer, and diabetes. These CNCDs are the main causes of death in Brazil and worldwide, and are therefore the greatest global health problem. It is estimated that approximately 70% of deaths worldwide are caused by this problem every year (Santos; Alves; Aidar, 2023).

Since CNCDs are pathological processes with a complex development and large-scale negative impacts, they have become a major issue for governments from across the world, given that these diseases affect all socio-economic classes. In light of this, in 2011, the United Nations (UN) organized a high-level meeting to debate the impacts of CNCDs and also propose a challenge to address this problem, with measures aimed primarily at health promotion and prevention (Santos; Alves; Aidar, 2023).

The suggestion to address this problem with health promotion and prevention measures stems from the fact that these diseases worsen continuously, meaning that healthcare for the affected person needs to be consecutive, systematic, and prolonged (Becker; Heidemann, 2020).

On the other hand, it was revealed that elderly people are highly susceptible to degenerative diseases, such as cardiovascular, musculoskeletal, psychological, cancer, and neurological diseases. It can be noted from the above that the ageing process, when associated with diseases, significantly compromises the autonomy and independence of elderly people (Paschoal, 2022).

Therefore, it should be noted that there are countless causes that can lead elderly people to present total or partial limitations, compromising the performance of their daily activities, and this is an increasingly common reality (Paschoal, 2022).

A study carried out with 23,815 elderly people found that 7,233 (30.1%) reported having difficulties performing one or more activities of daily living, with a prevalence of 81.2% participants with functional limitations that required help to perform them. It is known that with the prevalence of dependent elderly people there is a growing need for people to provide care to them in the home environment, and this role is usually carried out by an informal family caregiver or an unpaid friend (Barbosa *et. al*, 2020).

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The caregiver's role has become vital with the increase in life expectancy and the development of more efficient resources to treat illnesses. The experience of providing care to an ill family member can be a significant burden for the caregiver, leading to privations and changes in family dynamics (Delalibera et al., 2015).

Caregivers can be defined as formal or informal. The formal caregiver is a professional who is academically trained to meet the specific needs of the patient, while the informal caregiver is conceived as a family member or friend who is asked to provide most of the daily care for the patient in the family context (Diniz, et. al, 2018).

With the onset of a chronic illness in the family, the ill family member requires care due to the clinical complications of their state of health, and the caregiver's occupational life is compromised in the spheres of self-care, work, and leisure, as they have less time to care for themselves and to interact with others outside the family. They experience difficulties that can have negative consequences on their daily lives, such as overload, depressive symptoms, anxiety, and increased stress levels (Machado, Dahdah, Kebbe 2018).

Considering the importance and necessity of self-care capacities in the context of the caregiver's life, the present study focused on self-care capacities as necessary strategies for promoting life and health, as well as for managing the chronic illnesses suffered by family caregivers. In order to do this, the Self-Care Deficit Nursing Theory (SCDNT) was used, with specific reference to the central concept of self-care capacities. The conceptual structure and what it consists of, according to Orem, are described below (Orem, 2006).

In this sense, Dorothea Orem's (2006) Self-Care Deficit Nursing Theory (SCDNT), which conceives self-care as the practice of activities that an individual initiates and carries out for their own benefit, in order to maintain life, health, and well-being, i.e. what a person is capable of doing for themselves and to themselves. One of its central concepts is self-care skills, which includes the knowledge, skills, and experiences obtained throughout life, informally or otherwise, and which are used as a premise for self-care actions.

Silva, et al. (2022), emphasize that self-care skills are essential strategies for family caregivers due to their daily work overload. Self-care in itself can be understood as a set of actions, carried out deliberately, to maintain life, health, well-being, and quality of life.

From the point of view of conceptual structure, self-care skills are divided into three elements:

- Core dispositions and capacities consist of the acquisition of personal skills to enable individuals to learn how to care for themselves. They therefore require hearing, sight, functional capacity, or other basic conditions. Otherwise, learning and performing any activity in life will be compromised (Orem, 2006).
- The capacity components refer to an individual's ability to reason, learn, and perform learned activities. These are inquiry operations that seek empirical and technical knowledge in order to understand what, why, what for, and how should be the phenomenon learned in question. Thus, the individual appropriates the knowledge. They become its controller. The power components facilitate the execution of self-care operations, as they establish the reasons, objectives, and methodology of self-care, i.e. the person knows how to self-care (Orem, 2006).
- Finally, self-care operations mean that people are prepared or ready to perform self-care. Emphasizing this situation to family caregivers, it can be stated that, through core capacities, they have exercised their developmental capacities and operations to care for themselves. Consequently, they are able to determine what is required for self-care and make decisions regarding their requirements and actions in this role (Orem, 2006).

Self-care capacities (SCCs) can also be studied in relation to development, operability, and adequacy. Development is defined by determining the types of self-care actions that people can perform. Operability, in turn, is described by the types of actions that people perform consciously and effectively, deliberately, for the purpose of self-care. Adequacy is determined when comparing the type of self-care actions that can be performed and the type of self-care required to satisfy the existing or projected demand for therapeutic self-care, in the daily context, when performing caregiver practices (Nicolato; Couto; Castro, 2016).

This scope of the SCCs is highly relevant when directed at family caregivers, considering that, in their daily lives, their self-care practices are compromised by the commitment and high workload that their family member usually demands. Caregivers need self-care so that they can be physically and mentally able to cope with their daily activities, which are usually required in their daily work of providing care for their elderly family member (Nicolau; Couto; Castro, 2016).

To assess the condition of the elderly person's SCCs, it is necessary to have valid and reliable instruments. However, a wide-ranging literature review found that in Latin America, and specifically in Brazil, there is no such resource, but there are scales with other study objects, such as the Psychiatric Patient Family Caregiver Burden Scale, the Informal Caregiver Burden Assessment Questionnaire, the Dyad Relationship Scale, and others. In light of the above, the validity and reliability of a scale capable of measuring how family caregivers feel about their self-care abilities is justified. Finally, this study aimed to analyze the psychometric properties of the self-care capacity scale for the informal primary family caregiver.

METHODS

Study design

This is a methodological, descriptive, and analytical study.

Psychometry

In order to understand what psychometric properties are, it is necessary to establish the definition of psychometry, which consists of the representation of the theory and measurement technique related to the processes of mental elaboration, especially applied in the fields of Psychology and Education (Pasquali, 2009).

Psychometry is based on the theory of measurement in science in general, i.e. the quantitative method whose main attribute and advantage is that it represents nature's knowledge more accurately than using trivial language to describe the observation of natural phenomena (Pasquali, 2009).

In general, psychometry aims to explain the meaning of the answers provided by participants to a series of activities, usually called items. The term "psychometric properties" stems from psychometry (Pasquali, 2009).

Validity consists of whether an instrument measures exactly what it is designed to measure. It is clear that validity is not an instrument characteristic and must be determined in relation to a particular question, since it refers to an established population (Souza; Alexandre; Guirardello, 2017).

The properties of measurement - validity and reliability - are not totally independent. Researchers claim that an unreliable instrument cannot be valid; however, a reliable instrument may not always be valid. Therefore, high reliability does not ensure the validity of an instrument (Souza; Alexandre; Guirardello, 2017).

The types of validity are as follows: content; criterion; concurrent; predictive; construct; known groups technique; convergent; discriminant; structural or factorial, and cross-cultural. In the present study, structural or factorial validity and divergent or discriminant validity were used.

Structural or Factorial Validity (Exploratory Factor Analysis - EFA): these statistical tests are defined as a set of multivariate techniques which aim to find the specific and underlying structure in a certain data matrix and establish the number and nature of latent variables (factors and items) which best specify a set of observed variables. By analyzing the structure of the interrelationships of a given number of observed variables, EFA defines the factor(s) and items that best explain their covariance, eliminating items that behave inversely (Damásio, 2012).

The identified variables (instrument items) are part of the same factor when, and if, they share common variance and are influenced by the same underlying construct, which is the factor (Brown, 2006). Thus, a factor refers to a latent variable (e.g. quality of life) that affects more than one observed variable and more than one factor. However, EFA will only show the item of that factor that represents it in its essence (Damásio 2012|).

Therefore, the aim of EFA is to identify these factors and estimate the relationships between them and the observed variables. However, EFA sets out from a correlation or covariance matrix of the observed variables and uses statistical techniques to extract the latent factors with the respective items that best explain the structure of the object in question (Damásio 2012).

It is possible to correlate items by grouping them into domains (or dimensions). The variables that are most representative are identified, reducing the data (items) and creating a new, smaller, and more significant set. With EFA, it can be determined whether an instrument is unidimensional or composed of dimensions (Echevarría-Guanilo; Gonçalves; Romanoski, 2017).

Divergent or discriminant validity is an alternative way of testing the hypothesis that the measurements produced by an instrument are not mistakenly associated with different constructs. The extent to which the scale discriminates against variables from which it should differ is calculated (Souza; Alexandre; Guirardello, 2017).

This validity consists of the extent to which a measurement does not correlate with other measurements from which it is supposed to differ (Sánchez, 1999; Pasquali 2009). Still in relation to validity, careful planning of the validation process must be carried out during the instrument's preparation in order to also collect the necessary data. The correlations between the measurements involved in this process can be presented through a matrix entitled "multiconcept-multimethod" or "multimethod-multirater" (Morales Vallejo, et al., 2003; Pasquali 2009).

It tests the hypothesis that the target measurement is not inadequately related to different constructs, i.e. to variables from which it should diverge (Polit; Beck, 2019).

In the field of psychometry, it is also necessary to understand what is known as reliability, which refers to the level of consistency with which the items in the instrument measure the proposed attribute free of measurement error and the level to which the instrument allows consistent results to be reproduced and obtained when applied on different occasions, except for random errors. If there are no errors in the measurement or if they are minimized, the measurement can be considered reliable (Echevarría-Guanilo; Gonçalves; Romanoski, 2017).

In the literature researched, reliability is also referred to as precision, agreement, equivalence, consistency, objectivity, reliability, constancy, reproducibility, stability, confidence and homogeneity, and these terms are also used to establish the reliability

of the measurement scale. The use of these terms varies according to the aspect of the test that is being emphasized and the literature used (Echevarría-Guanilo; Gonçalves; Romanoski, 2017).

The research into reliability includes three important aspects: internal consistency, reliability itself and measurement error. In this study, only the internal consistency aspect was used, which consists of item homogeneity, i.e. the extent to which items measure the same attribute and produce consistent results (Polit; Yang, 2019; Mokkink, *et al.* 2017).

Internal consistency analysis is possible for instruments composed of multiple items applied on a single occasion. To do this, the internal consistency of the total number of items can be assessed (unidimensional instruments) or according to the sub-scales that compose the instrument, which can be multidimensional (Polit; Yang, 2019; Mokkink, *et al.* 2017).

Among the most commonly used analysis methods for calculating the internal consistency of a measuring instrument are the split-half test, the Kuder-Richardson test, and Cronbach's alpha coefficient. Cronbach's alpha test was used in the present study (Echevarría-Guanilo; Gonçalves; Romanoski, 2017).

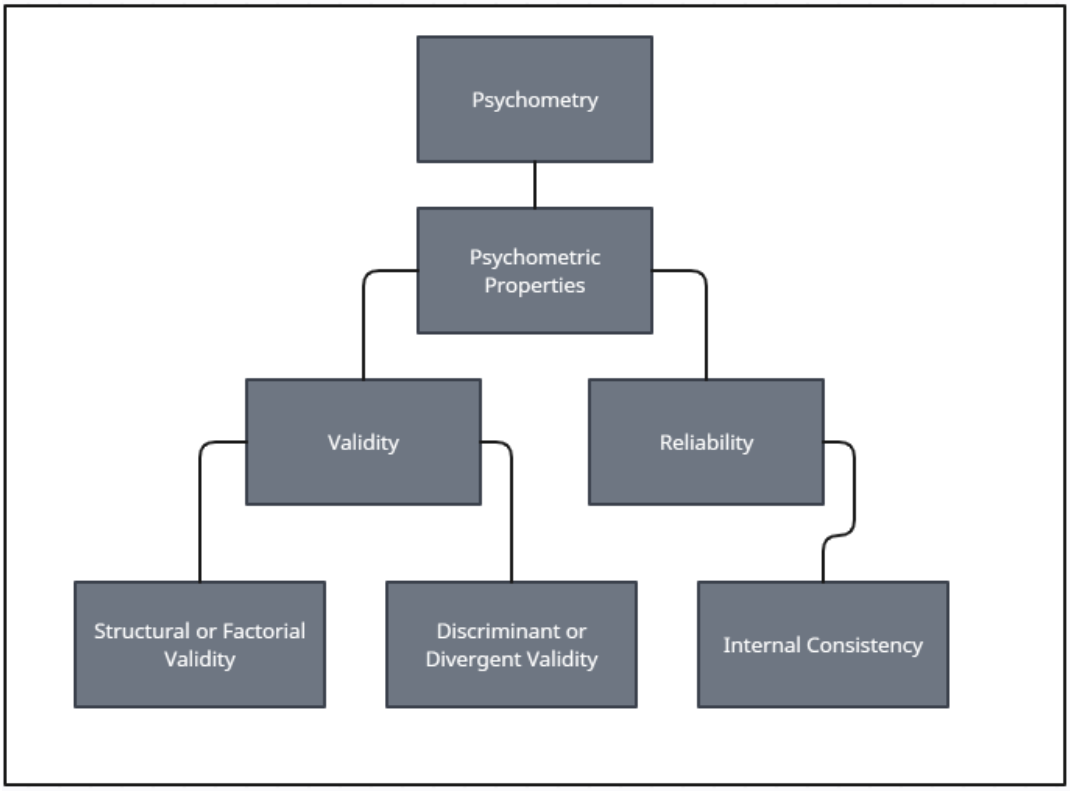
Cronbach's alpha is a technique in which the item variances are based on discrete numerical scores that represent the various possibilities for each item in the instrument (Polit; Yang, 2019; Bandeira, *et al*, 2007).

It is based on the assumption that the scale is composed of homogeneous elements randomly selected from the population and that the elements show the same characteristic. Cronbach's alpha is recommended for measurement instruments that use Likert-type or multiple-choice scales whose categories have an ascending or descending order of values (Echevarría-Guanilo; Gonçalves; Romanoski, 2017).

When using Cronbach's alpha, it is necessary to consider several of its properties: the alpha yields a single value for any set of data and yields the value for the distribution mean of all the possible coefficients of the parts that compose the instrument, thus representing an association for the data set established (Echevarría-Guanilo; Gonçalves; Romanoski, 2017).

Furthermore, it not only depends on the magnitude of the correlation between the items, but also on the number of items in the scale. If the number of items in an instrument is increased, the alpha value will also increase. Consequently, items from two instruments combined into a single scale increase the alpha value and high alpha values can indicate the existence of a high level of redundant items (Echevarría-Guanilo; Gonçalves; Romanoski, 2017).

Figure 1 portrays the methodological framework of psychometry used in the present study



Source: author of the study

FIGURE 1 – METHODOLOGICAL FRAMEWORK OF PSYCHOMETRY

STUDY PARTICIPANTS, SAMPLE, AND SAMPLING

The study participants were people aged 18 or over, of both sexes, living in various cities in southern Minas Gerais who worked as family caregivers.

Pasquali et al. (2010), mentions that a minimum ratio of five to one (5 participants for each item) regarding the sample size and the number of items that compose the scale, is necessary for an adequate survey of the psychometric characteristics that can be revealed from the exploratory factor analysis. Considering that the instrument to be used to obtain psychometric properties was the Informal Primary Family Caregiver Self-Care Capacity Scale, consisting experimentally of 30 items, the sample size was composed of 151 informal primary family caregivers. Sampling was non-probabilistic, by convenience and snowball.

INCLUSION AND EXCLUSION CRITERIA

The inclusion criteria were the following:

a) having been an informal primary family caregiver for at least six months, since, according to Monteiro (2007), a person is only able to provide a safe or effective opinion when they have been performing a certain activity and function for at least six months.

b) not receiving a salary for the work performed;

The exclusion criterion consisted of not living in a rural area.

Research instruments

The following instruments were selected:

- Sociodemographic and health characterization of the informal primary family caregiver (SHCIPFG), consisting of questions related to age, sex, education, children, health status, time spent as a caregiver and reason for being a caregiver, among others.
- The Informal Primary Family Caregiver Self-Care Capacity Scale (IPFCSCCS) was experimentally composed of 30 items and, after Exploratory Factor Analysis (EFA), it consisted of 22 items and 6 domains (1- personal care; 2- rest and leisure; 3- health prevention/control; 4- social aspects; 5- well-being and 6- religiosity and spirituality), with five response options: totally disagree (1 point); 2- disagree (2 points); 3- neither agree nor disagree (3 points); 4- agree (4 points); and 5- totally agree (5 points). The minimum score will be 22 and the maximum 110 points. The higher the score, the better the self-care condition and vice versa. The concepts, according to their number of points, will be as follows: 22 to 39.6 points (poor); 39.6 to 57.2 points (regular); 57.2 to 74.8 points (good); 74.8 to 92.4 (very good); and 92.4 to 110 points (excellent);

DATA ANALYSIS

To obtain the data, the database was prepared and fed using the SPSS (Statistical Package for the Social Sciences) computer program, version 23. Factor analysis of the scale was conducted using the computer program Factor Analysis (2006-2018). Descriptive and inferential statistics were used. Descriptive statistics used absolute and relative frequencies for categorical variables. For continuous or numerical variables, measurements of central tendency and dispersion were used. The following inferential statistics procedures were used: Spearman's Correlation Index, to establish the correlation between the Caregiver Burden Scale and the Informal Primary Family Caregiver Self-Care Capacity Scale. The Cronbach's alpha test was used to assess the reliability of the full scale from the perspective of internal consistency, with a minimum value of 0.6 being considered reliable for the full scale and its domains (Pollit; Beck, 2019).

The Mann-Whitney and Kruskall-Wallis tests were used to assess the discriminant validity of the IPFCSCCS with the variables described above.

ETHICAL ASPECTS OF THE RESEARCH

The present study complied with the precepts established by Resolution 466/12, of December 12, 2012, of the Ministry of Health, which covers ethics in research with human beings and the special protection of the lives of participants in scientific research. The study was submitted to the Research Ethics Committee of the Itajubá Medical School, according to substantiated opinion no. 5.131.517. Ethical aspects related to the interviewee's total anonymity, privacy, and autonomy to accept or not to participate in the study were respected.

RESULTS

Table 1 - Items with their respective factor loadings and variable groupings. Itajubá-MG (n=151). 2024

		Fator			
		1	2	3	5
1	I know that during the day I need to have some time for myself.	0.220	0.814	0.231	0.120

2	I know that in my daily diet I need to eat meat, fruit, and vegetables.	0.410	0.354	0.319	-0.217
3	I know that I need to drink water during the day.	0.121	0.144	0.489	-0.002
4	I know that I need to follow a diet to control my chronic illnesses, if necessary.	0.343	0.398	0.662	-0.057
5	I know that I have to have my chronic illnesses checked by a doctor, if necessary.	0.047	0.181	0.877	0.098
6	I know that I need to reach out to my city's health resources in order to adequately manage my chronic illnesses, if necessary.	0.017	0.170	0.845	-0.009
7	I know that I need daily and weekly rest as a family caregiver.	0.222	0.784	0.210	0.084
8	I know the need and importance of having leisure time as a caregiver.	0.318	0.654	0.132	-0.105
9	I need to care for myself in order to provide good care for my family member.	0.758	0.334	-0.018	0.014
10	I know that I need to have friends with whom I can talk in times of personal need.	0.294	0.162	0.049	-0.084
11	I know that I need to have time to provide care to my family member and also to care for myself.	0.605	0.047	0.180	0.087
12	I know that I need to prevent and control situations that compromise my health.	0.716	0.111	0.147	0.040
13	I know that I need to have some form of social participation.	0.641	0.060	0.139	-0.005
14	I know that I cannot become stressed when I provide care to my family member.	0.588	0.149	0.024	0.354
15	I know that I need to be well in order to provide care to my family member.	0.781	0.163	0.132	0.182
16	I know that, in difficult times, I can use my religion/religiosity to help solve my problems.	0.150	0.009	0.046	0.027
17	Using spirituality can give me the strength to perform my tasks as a caregiver.	0.100	0.042	0.043	0.006
18	I know that participating in social groups reduces daily stress.	0.456	0.071	0.002	-0.050
19	I need to control my emotions during my caregiving activities.	0.025	0.207	-0.102	0.755
20	I know that I should talk to my family when I feel tired or overwhelmed.	0.271	0.316	0.086	0.176
21	I know that I need to ask for help from my family as a caregiver.	-0.106	0.215	0.026	0.152
22	Knowing how to provide care to my family member offers me peace of mind and security.	0.208	-0.014	0.130	-0.057

Source: IPFCSCCS

From a statistical point of view, the variables with the highest factor loadings were selected, ranging from (-0.217 to 0.877). According to the distribution in the table above, 8 variables (items) would compose Factor 1; 7 variables (items) would compose Factor 2 and so on.

Table 2 – Internal consistency of the full scale and its domains. Itajubá-MG (n=151). 2024

Domains	Cronbach's alpha	No. of items
1 – Personal Care	0.860	7
2 – Rest and Leisure	0.864	3
3 – Health prevention/control	0.799	4
4 – Social Aspects	0.692	4
5 – Well-being	0.615	2
6 – Religiosity and Spirituality	0.866	2
Full scale	0.885	22

Source: IPFCSCCS, 2024.

It was found that Cronbach's alpha values between the full scale and its domains ranged from 0.885 to 0.615.

Table 3 - Comparison between sexes and self-care scales. Mann-Whitney non-parametric test. Itajubá-MG (n=151). 2024

		Sex			Result
		Male	Female	Mann-Whitney test (p)	
Personal Care	Mean	32.7	32.6		
	Median	33.0	34.0	0.729	Male = Female
	Standard deviation	2.4	3.5		
	n	41	110		
Rest and Leisure	Mean	13.7	13.1		
	Median	14.0	14.0	0.372	Male = Female
	Standard deviation	1.8	2.8		
	n	41	110		
Health Prevention/Control	Mean	18.7	18.2		
	Median	20.0	20.0	0.560	Male = Female
	Standard deviation	1.7	2.9		
	n	41	110		
Social Aspects	Mean	17.4	17.4		
	Median	18.0	18.0	0.802	Male = Female
	Standard deviation	2.7	3.0		
	n	41	110		
Well-being	Mean	9.5	9.1		
	Median	10.0	10.0	0.388	Male = Female
	Standard deviation	0.7	1.5		
	n	41	110		
Religiosity and Spirituality	Mean	9.3	9.6		
	Median	10.0	10.0	0.148	Male = Female
	Standard deviation	1.1	.8		
	n	41	110		
Full Scale	Mean	101.4	100.0		
	Median	103.0	103.0	0.670	Male = Female
	Standard deviation	7.6	10.1		
	n	41	110		

Source: SHCIPFG -IPFCSCCS

Table 4 - Association between level of education and self-care scales. Kruskal-Wallis non-parametric test and Tukey's multiple comparisons when significant. Itajubá-MG (n=151). 2024

		Level of education						Result
		1 - IES	2- CES	3- IHS	4- CHS	5- Others	Kruskal-Wallis test (p)	
Personal Care	Mean	30.9	32.7	30.5	32.9	33.3		
	Median	33.0	33.0	31.0	34.0	34.0	0.004*	(1) = (3) < (4) = (5)
	Standard deviation	6.4	2.7	2.2	2.2	2.9		

	n	16	19	11	56	49		
Rest and Leisure	Mean	12.8	12.1	13.7	13.4	13.8		
	Median	14.0	13.0	14.0	14.0	15.0	0.292	Equal
	Standard deviation	3.1	3.8	1.1	2.3	2.1		
	n	16	19	11	56	49		
Health Prevention/Control	Mean	18.4	18.6	17.6	17.9	18.8		
	Median	19.5	20.0	18.0	19.0	20.0	0.097	Equal
	Standard deviation	2.1	2.3	2.2	2.9	2.6		
	n	16	19	11	56	49		
Social Aspects	Mean	16.6	16.0	16.9	17.3	18.6		
	Median	18.0	17.0	17.0	18.0	20.0	0.012*	(1) = (2) = (4) < (5)
	Standard deviation	3.5	4.1	2.1	2.8	2.0		
	n	16	19	11	56	49		
Well-being	Mean	9.2	9.5	9.0	9.0	9.3		
	Median	10.0	10.0	9.0	10.0	10.0	0.731	Equal
	Standard deviation	1.2	0.6	1.0	1.6	1.2		
	n	16	19	11	56	49		
Religiosity and Spirituality	Mean	9.9	9.6	9.1	9.3	9.7		
	Median	10.0	10.0	10.0	10.0	10.0	0.024*	(1) = (5) > (3) = (4)
	Standard deviation	0.3	0.8	1.0	1.1	0.6		
	n	16	19	11	56	49		
Full Scale	Mean	13.8	13.4	12.8	13.6	13.8		
	Median	14.5	14.0	13.0	14.0	15.0	0.510	Equal
	Standard deviation	1.6	1.8	2.0	1.4	1.5		
	n	16	19	11	56	49		

Source: SHCIPFG - IPFCSCCS

Table 5 – Levels of association between religion and self-care scales. Kruskal-Wallis non-parametric test. Itajubá-MG (n=151). 2024

		Religion					Result
		1-Catholic	2-Evangelical	3-Spiritualist	4-Other	Kruskal-Wallis test (p)	
Personal Care	Mean	32.7	32.9	30.1	33.8		
	Median	34.0	34.0	31.0	35.0	0.279	Equal
	Standard deviation	3.3	2.6	5.2	1.8		
	n	100	37	9	5		
Rest and Leisure	Mean	13.4	13.5	12.2	11.6		
	Median	14.0	14.0	12.0	13.0	0.348	Equal
	Standard deviation	2.6	1.9	3.2	4.0		
	n	100	37	9	5		

Prevenção/Controle de Saúde	Mean	18.6	18.1	16.7	17.0		
	Median	20.0	19.0	18.0	19.0	0.179	Equal
	Standard deviation	2.4	2.3	3.9	5.1		
	n	100	37	9	5		
Social Aspects	Mean	17.7	17.2	15.7	17.8		
	Median	19.0	18.0	16.0	20.0	0.111	Equal
	Standard deviation	2.9	2.9	3.0	3.5		
	n	100	37	9	5		
Well-being	Mean	9.2	9.2	8.3	9.8		
	Median	10.0	10.0	9.0	10.0	0.180	Equal
	Standard deviation	1.2	1.3	1.9	0.4		
	n	100	37	9	5		
Religiosity and Spirituality	Mean	9.5	9.5	9.6	10.0		
	Median	10.0	10.0	10.0	10.0	0.590	Equal
	Standard deviation	0.9	0.9	0.7	0.0		
	n	100	37	9	5		
Full Scale	Mean	101.1	100.4	92.6	100.0		
	Median	104.0	102.0	93.0	100.0	0.209	Equal
	Standard deviation	9.3	8.1	15.0	8.7		
	n	100	37	9	5		

Source: SHCIPFG - IPFCSCCS

Table 6 – Levels of association between marital status and self-care scales. Kruskal-Wallis non-parametric test. Itajubá-MG (n=151). 2024

		Marital status					Result
		1-single	2-married	3-widowed	4-divorced	Kruskal-Wallis test (p)	
Personal Care	Mean	33.0	32.8	31.9	31.8		
	Median	34.0	33.0	33.0	34.0	0.782	Equal
	Standard deviation	2.4	2.3	3.3	6.5		
	n	43	69	14	20		
Rest and Leisure	Mean	13.3	13.4	12.4	13.1		
	Median	14.0	14.0	13.0	15.0	0.521	Equal
	Standard deviation	2.2	2.4	3.1	3.3		
	n	43	69	14	20		
Health Prevention/Control	Mean	18.4	18.5	17.6	17.9		
	Median	20.0	20.0	19.5	19.5	0.814	Equal
	Standard deviation	2.5	2.4	3.5	3.1		
	n	43	69	14	20		
Social Aspects	Mean	17.6	17.4	17.4	17.3		
	Median	18.0	18.0	19.0	19.0	0.901	Equal

	Standard deviation	2.4	2.9	3.2	4.1		
	n	43	69	14	20		
Well-being	Mean	9.0	9.3	9.2	9.4		
	Median	10.0	10.0	9.5	10.0	0.325	Equal
	Standard deviation	1.3	1.4	0.9	1.4		
	n	43	69	14	20		
Religiosity and Spirituality	Mean	9.4	9.4	9.7	9.9		
	Median	10.0	10.0	10.0	10.0	0.221	Equal
	Standard deviation	1.0	1.0	0.7	0.4		
	n	43	69	14	20		
Full Scale	Mean	100.7	100.9	98.3	99.2		
	Median	103.0	104.0	99.5	104.5	0.649	Equal
	Standard deviation	7.4	8.7	9.7	15.8		
	n	43	69	14	20		

Source: SHCIPFG - IPFCSCCS

Table 7 - Comparisons between Having Children (Yes vs. No) and self-care scales. Mann-Whitney non-parametric test. Itajubá-MG. (n=151). 2024

		Has children			Result
		Yes	No	Mann-Whitney test (p)	
Personal Care	Mean	32.4	33.1		
	Median	33.0	34.0	0.238	Yes = No
	Standard deviation	3.6	2.4		
	n	101	50		
Rest and Leisure	Mean	13.1	13.7		
	Median	14.0	14.0	0.562	Yes = No
	Standard deviation	2.9	1.6		
	n	101	50		
Health Prevention/Control	Mean	18.2	18.6		
	Median	20.0	20.0	0.507	Yes = No
	Standard deviation	2.8	2.3		
	n	101	50		
Social Aspects	Mean	17.1	18.0		
	Median	18.0	18.0	0.236	Yes = No
	Standard deviation	3.2	2.3		
	n	101	50		
Well-being	Mean	9.2	9.2		
	Median	10.0	10.0	0.439	Yes = No
	Standard deviation	1.4	1.1		
	n	101	50		
Religiosity and Spirituality	Mean	9.5	9.5		
	Median	10.0	10.0	0.658	Yes = No
	Standard deviation	.9	.9		

	n	101	50		
Full Scale	Mean	99.5	102.1		
	Median	103.0	104.5	0.257	Yes = No
	Standard deviation	10.4	7.1		
	n	101	50		

Source: SHCIPFG - IPFCSCCS

Table 8 - Association between time spent as a caregiver and self-care scales. Kruskal-Wallis non-parametric test and Tukey's multiple comparisons when significant. Itajubá-MG. (n=151). 2024

		Time as a caregiver					Result
		1-6 m a 1 ano	2-1 a 5 anos	3-5 a 10 anos	4-acima 10 anos	Kruskal-Wallis test (p)	
Personal Care	Mean	32.3	33.0	32.8	32.0		
	Median	33.0	34.0	34.0	33.5	0.51	Equal
	Standard deviation	2.5	2.3	3.4	4.6		
	n	18	63	32	38		
Rest and Leisure	Mean	13.4	13.4	13.1	13.3		
	Median	13.5	14.0	14.0	14.0	0.531	Equal
	Standard deviation	1.0	2.5	2.9	2.8		
	n	18	63	32	38		
Health Prevention/Control	Mean	18.1	18.4	18.0	18.6		
	Median	18.5	20.0	19.5	20.0	0.412	Equal
	Standard deviation	1.9	2.8	2.8	2.4		
	n	18	63	32	38		
Social Aspects	Mean	16.8	17.8	17.3	17.2		
	Median	17.5	19.0	18.0	18.0	0.373	Equal
	Standard deviation	2.6	2.6	3.0	3.4		
	n	18	63	32	38		
Well-being	Mean	9.4	9.3	9.2	8.9		
	Median	10.0	10.0	10.0	10.0	0.842	Equal
	Standard deviation	0.8	1.2	1.4	1.5		
	n	18	63	32	38		
Religiosity and Spirituality	Mean	9.1	9.5	9.4	9.8		
	Median	10.0	10.0	10.0	10.0	0.046*	(6m-1ano) < (acima 10 anos)
	Standard deviation	1.1	0.9	1.0	0.6		
	n	18	63	32	38		
Full Scale	Mean	99.1	101.4	99.8	99.8		
	Median	99.5	104.0	103.0	103.0	0.344	Equal
	Standard deviation	6.4	8.8	10.7	11.0		
	n	18	63	32	38		

Source: SHCIPFG - IPFCSCCS

Table 9 - Levels of association between health status and self-care scales. Kruskal-Wallis non-parametric test. Itajubá-MG (n=151). 2024

		Health status						Result
		1-Excellent	2-Very good	3-Good	4-Regular	5-Poor	Kruskal-Wallis test (p)	
Personal Care	Mean	32.8	33.3	32.3	31.8	32.9		
	Median	33.5	35.0	33.0	34.0	34.0	0.458	Equal
	Standard deviation	2.3	2.3	2.7	5.9	3.1		
	n	48	28	43	24	8		
Rest and Leisure	Mean	13.8	13.4	13.2	12.2	14.0		
	Median	14.5	14.5	14.0	14.0	14.0	0.337	Equal
	Standard deviation	1.9	2.4	2.1	4.1	1.1		
	n	48	28	43	24	8		
Health Prevention/Control	Mean	18.8	18.5	17.8	18.1	18.8		
	Median	20.0	20.0	19.0	20.0	20.0	0.316	Equal
	Standard deviation	1.7	2.6	2.7	4.0	1.9		
	n	48	28	43	24	8		
Social Aspects	Mean	17.9	17.8	17.5	16.1	16.9		
	Median	18.5	18.5	18.0	17.0	19.0	0.543	Equal
	Standard deviation	2.4	2.6	2.5	3.9	4.5		
	n	48	28	43	24	8		
Well-being	Mean	9.3	9.1	9.2	8.9	9.9		
	Median	10.0	10.0	10.0	10.0	10.0	0.412	Equal
	Standard deviation	0.8	1.7	1.2	1.8	0.4		
	n	48	28	43	24	8		
Religiosity and Spirituality	Mean	9.4	9.6	9.4	9.7	9.9		
	Median	10.0	10.0	10.0	10.0	10.0	0.626	Equal
	Standard deviation	1.0	0.8	1.0	0.6	0.4		
	n	48	28	43	24	8		
Full Scale	Mean	102.0	101.6	99.4	96.8	102.3		
	Median	104.0	103.0	103.0	102.0	106.5	0.371	Equal
	Standard deviation	7.3	7.5	8.3	15.3	10.1		
	n	48	28	43	24	8		

Source: SHCIPFG - IPFCSCCS

Table 10 - Comparisons between the reason for being a caregiver and self-care scales. Kruskal-Wallis non-parametric test and Tukey's multiple comparisons when significant. Itajubá-MG (n=151). 2024

		Reason				Result
		1-personal choice	2-appointed by the family	3-other reasons	Kruskal-Wallis test (p)	
Personal Care	Mean	32.6	32.7	33.3		
	Median	34.0	35.0	33.0	0.863	Equal
	Standard deviation	3.4	3.0	1.8		
	n	132	9	10		
Rest and Leisure	Mean	13.2	13.9	14.2		

	Median	14.0	14.0	15.0	0.365	Equal
	Standard deviation	2.7	1.2	1.3		
	n	132	9	10		
Health Prevention/Control	Mean	18.4	18.3	17.9		
	Median	20.0	19.0	20.0	0.931	Equal
	Standard deviation	2.6	2.3	3.9		
	n	132	9	10		
Social Aspects	Mean	17.2	18.7	19.4		
	Median	18.0	20.0	20.0	0.018*	Personal choice < Others
	Standard deviation	3.0	1.9	0.8		
	n	132	9	10		
Well-being	Mean	9.2	9.0	9.5		
	Median	10.0	9.0	10.0	0.247	Equal
	Standard deviation	1.4	0.7	0.7		
	n	132	9	10		
Religiosity and Spirituality	Mean	9.5	9.6	9.8		
	Median	10.0	10.0	10.0	0.485	Equal
	Standard deviation	0.9	0.9	0.6		
	n	132	9	10		
Full Scale	Mean	100.0	102.1	104.1		
	Median	103.0	107.0	106.5	0.303	Equal
	Standard deviation	9.7	8.6	6.6		
	n	132	9	10		

Source: SHCIPFG - IPFCSCCS

Regarding discriminant validity, it was found that there was a level of significance (p<=0.05) in relation to “Level of Education” and the domains Personal Care; Social Aspects; Religiosity and Spirituality; In “Time Spent as a Caregiver” with the domain “Religiosity and Spirituality”. Also, between “Reasons for being a caregiver” and the “Social Aspects” domain.

DISCUSSION

The discussion of the present study is organized into three distinct parts: 1) Exploratory Factor Analysis (EFA); 2) Reliability through internal consistency; and 3) Convergent and discriminant validity.

EFA is a construct validation method used to assess the dimensionality and components of an instrument (Cunha, De Alemida Neto, Stackfleth, 2016), which reduced the IPFCSCCS from 30 to 22 items with 6 domains: 1- Personal Care; 2- Rest and Leisure; 3- Health Prevention/Control; 4- Social Aspects; 5- Well-being; and 6- Religiosity and Spirituality.

There are other scales that have been submitted to EFA and are related to caregivers. In one study, EFA was used to validate the Caregiver Competence Assessment Questionnaire for the Brazilian reality, yielding four factors with the possible exclusion of one item. To perform this deletion, Confirmatory Factor Analysis (CFA) was performed, observing a high correlation, thus retaining the item (Santos, et al.; 2021). Another study carried out in Spain on the Generalized Self-Efficacy Scale performed EFA followed by CFA, obtaining a unidimensional scale. This suggests the need for future work with the IPFCSCCS, with the aim of applying CFA (Blanco, et al., 2019).

Based on these six domains of the IPFCSCCS, internal consistency was analyzed, studying the correlation of items between the same traits. Internal consistency was shown to be effective through Cronbach’s alpha test for the full scale and its domains 1;2;3; and 6, by detecting values above 0.788. This means that the grouped items consistently reflect their domains and the scale in its entirety. When evaluating any phenomenon, it is essential that internal consistency is represented by indicators that ensure it is safe to measure what is intended (Cunha, De Alemida Neto, Stackfleth, 2016).

The fourth and fifth domains, although they have shown internal consistency at their limit values, are acceptable, especially in relation to the nature of the items, as they refer to social aspects and well-being, as these are phenomena of a complex and comprehensive nature and, supposedly, were aspects that prevented a greater reach of Cronbach’s alpha (Tamayo; Tróccoli, 2009).

In addition to this, it should be noted that these domains consist of a reduced number of items (2 and 4 items) and this, combined with what was mentioned earlier, may have influenced internal consistency (Tamayo; Tróccoli, 2009). Further studies should analyze the behavior of reliability through the internal consistency of these two factors or domains.

Instruments related to caregivers that address phenomena other than self-care skills have also been validated in terms of reliability through their internal consistency. The Family Burden Interview Schedule (FBIS) showed Cronbach's alpha values of 0.82 for the overall objective burden score; 0.92 for the overall subjective scale; and 0.58 to 0.90 for the factors or domains (Bandeira, et al.; 2007).

The Informal Caregiver Burden Assessment Questionnaire had an alpha of 0.90, while the seven factors ranged from 0.62 to 0.88 (Martins; Ribeiro; Garret, 2004). The Dyad Relationship Scale is another instrument used to assess the quality of the relationship between caregivers and dependent elderly people, which has two factors. The "Conflict" and "Positive Interaction" domains showed internal consistency of 0.81 and 0.77, respectively (Queluz, et al., 2018). In general, the range of Cronbach's alphas in the literature was close to that obtained in the present study.

The discriminant validity of the construct was performed to assess whether the scale was capable of discriminating the difference between the groups in a certain direction as predicted in the formulation of the study's hypotheses. It was verified whether the instrument distinguishes individuals or populations in which a difference is expected. For instance, people with and without pain. This validity does not require the construct to correlate with non-similar variables (Cunha, De Alemida Neto, Stackfleth, 2016).

When performing discriminant validity, the sociodemographic and health variables were associated with the variables related to time and reason for being a caregiver. However, discrimination was found between the associations of the Informal Primary Family Caregiver Self-Care Capacity Scale with Level of Education, Time Spent as a Caregiver, and Reason for being a Caregiver. (Camargos, et al., 2009).

It can be inferred that this is related to the fact that these variables are part of the caregiver's life context. Based on a report of discriminant validity related to caregiver burden, the study analyzed the association of different variables with the Caregiver Burden Scale (Zarit Scale) applied to caregivers of children with cerebral palsy (Camargos, et al., 2009).

There was an association between the scale and two variables: family socioeconomic status ($p=0.03$) and severity of motor impairment in children with cerebral palsy ($p=0.05$). There was no significant difference in relation to the topographical diagnosis ($p=0.71$) and the age of the children with cerebral palsy ($p=0.035$) (Camargos, et al., 2009).

The aforementioned study used the same tests applied in the present study, namely Mann-Whitney and Kruskall-Wallis.

This study was limited to cities in the same state and, from the perspective of reliability, was restricted to internal consistency.

CONCLUSION

This work led to the conclusion that the Informal Primary Family Caregiver Self-Care Capacity Scale presented adequate psychometric evidence, characterizing it as a reliable and valid instrument to be used nationwide in research and healthcare for informal primary family caregivers. It is a resource that measures what it sets out to measure, and is available to the scientific community and healthcare professionals in the comprehensive assessment that should be implemented for this type of caregiver, who is still so underappreciated by the healthcare sector, family members, and society in general.

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