

Psychometric Evidence of the Self-Care Actions Scale Focusing on Basic Activities of Daily Living for Elderly People

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Abstract

Introduction: Basic Activities of Daily Living are indicators of functionality and physical independence and are part of the functional capacity of elderly people.

Objectives: to interpret the psychometric properties of the Self-Care Actions Scale with Focus on Basic Activities of Daily Living (EACAC-ABVD).

Methods: This was a methodological, descriptive and analytical study. The sample consisted of 1200 participants, of both sexes, aged 70 or over, living in cities in the south of the state of Minas Gerais. The instruments used were: Instrument to characterize the basic conditioning factors of elderly people; Self-Care Actions Scale with Focus on Basic Activities of Daily Living (EACAC-ABVD) and Scale to Assess Self-Care Capabilities (EACAC).

Results: EACAC-ABVD consisted of 25 items and four domains: 1) Personal hygiene activities (Cronbach's $\alpha = 0.968$); 2) Eating and oral hygiene activities (Cronbach's $\alpha = 0.924$); 3) Movement activities (Cronbach's $\alpha = 0.882$) and 4- Personal appearance activities (Cronbach's $\alpha = 0.717$). The convergent validity performed between the EACAC-ABVD and the EACAC presented: 1- ($r = 0.275$ and $p: <0.001$); 2- ($r = 0.225$ and $p: <0.001$); 3- ($r = 0.196$ and $p: <0.001$); 4) ($r = 0.106$ and $p: <0.001$) and total ($r = 0.203$ and $p: <0.001$). Discriminant validity: EACAC-ABVD with age group ($p: <0.001$) and education ($p: <0.001$).

Conclusion: The EACAC-ABVD demonstrated reliability and validity appropriate for research and nursing care.

Keywords: Functional Independence, Elderly, Validation Study, Daily Activities

1. Introduction

In the context of current human aging, two universal and irreversible sociodemographic realities are present: An increase in the number of elderly people and Longevity. However, it is not enough for humans to live longer and for there to be an increase in the number of elderly people. Is the most important thing to add years to life or life to years? Considering that the second alternative is chosen, it is essential that certain health indicators are adopted by elderly people, which serve as compasses for them throughout their lives [1,2]. Functional capacity, which consists of physical independence, autonomy, and an active life in relation to activities of daily living, is an important marker of health in human aging. In this sense, being sick for older people is socially represented by the inability to perform activities of daily living. Empowerment to perform these activities is the core of functionality, which is presented in three distinct types:

- 1) Basic or Self-Care Activities of Daily Living;
- 2) Instrumental Activities of Daily Living and
- 3) Advanced Activities of Daily Living [3,4].

Basic Activities of Daily Living (BADLs), also called self-care activities of daily living, stand out for being characterized as human survival activities. They consist of hygiene activities, such as taking a bath, brushing teeth and using the toilet; presentation activities identified by combing hair, cutting nails and putting on clothes and, finally, by basic movements represented by getting up and lying down in bed; getting up and sitting in an armchair, walking and climbing stairs. However, they reflect simple and automatic activities performed throughout the day by elderly people. They are the first activities of independence achieved in human life, in the condition of children and from child development [5-7].

Regarding the BADLs, they are the first to be achieved in human life and, didactically, the last to be lost. When they are compromised, theoretically, the other two types of daily activities are already hindered, which can vary in intensity. The BADLs are configured by basic human activities, essentially of biological or physical origin from the point of view of movement, walking or physical independence. Their non-fulfilment may be caused by the impossibility of self-care by the elderly person or by the absence of a family caregiver [5-7]. The greater the degree and extent of dependence, the greater the need for help the elderly person requires. The use of equipment such as canes, walkers, wheelchairs, and others may be valuable at this time. In addition, it is necessary to check the surroundings and adapt them to the user's needs. The home, in terms of its structure, must be changed, mainly in relation to the width of doors, safety bars, and the absence of stairs. These conditions are essential for the care of BADLs from the perspective of prevention or meeting the demands of walking of the elderly [8].

Longevity is a current phenomenon of universal dimension and irreversible nature. However, the consequences of longevity are also still unclear, data are scarce and there is widespread concern that advanced longevity represents a problem for both individuals and societies. It is understood that there is a hypothesis that the increasing proportion of long-lived people who survive to a late age will lead to an increase in Chronic Non-Communicable Diseases (NCDs) and their disabilities [9]. This complex process can have multiple consequences on the lives of these people. The main one is the impairment of functional capacity. To this end, measuring instruments that focus on basic self-care activities are essential [9]. Currently, in the literature, there are two scales that measure BADLs, namely the Katz index and the Barthel index. The first has six items, while the second has ten. It is also noteworthy that both do not have domains, being reduced scales [10,11]. The construction of a new scale (EACAC-ABVD) will be another opportunity for researchers and for broad gerontological assessment, offering new possibilities for clinical assessment and research with the presence of domains, which is not found in previous scales. Therefore, the present study aimed to evaluate the construction of the EACAC-ABVD and interpret its psychometric properties.

2. Method

2.1. Study Design

This study was methodological, descriptive and analytical.

2.2. Psychometry

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 mental elaboration processes, especially applied in the area of Psychology and Education [12]. Psychometrics is based on the theory of measurement in science in general, that is, the quantitative method whose main characteristic and advantage is the fact that it represents knowledge of nature with greater accuracy than the use of trivial language to describe the observation of natural phenomena [12]. In general, psychometrics seeks to explain the meaning of the responses

given by participants to a series of activities, normally called items. The expression "psychometric properties" comes from psychometrics [12]. Validity refers to the fact that an instrument measures exactly what it is intended to measure. It is clear that validity is not a characteristic of the instrument and must be determined in relation to a particular issue, since it refers to an established population.

The measurement properties- validity and reliability - are not entirely independent. Researchers state that an unreliable instrument cannot be valid; however, a reliable instrument may not always be valid. Therefore, high reliability does not guarantee the validity of an instrument. 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): these statistical tests are defined as a set of multivariate techniques that 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) that best specify a set of observed variables. By analysing the structure of the interrelations of a certain number of observed variables, EFA defines the factors and items that best explain their covariance, eliminating items that behave in an inverse manner.

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. Therefore, a factor refers to a latent variable (for example: quality of life) that interferes in more than one observed variable and in more than one factor. However, the EFA will show only the item of that factor that represents it in its essence. Thus, the objective of the EFA is to identify these factors and estimate the relationships between them and the observed variables. However, the EFA starts 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. It is possible to correlate the items, grouping them into domains (or dimensions). The variables that are most representative are identified, reducing data (items) and creating a new, smaller and more significant set. With EFA, it is determined whether an instrument is unidimensional or formed by dimensions. Convergent validity can be defined as the significant relationship between two or more measures of the same construct or theoretically related constructs, through the use of different assessment methods or instruments.

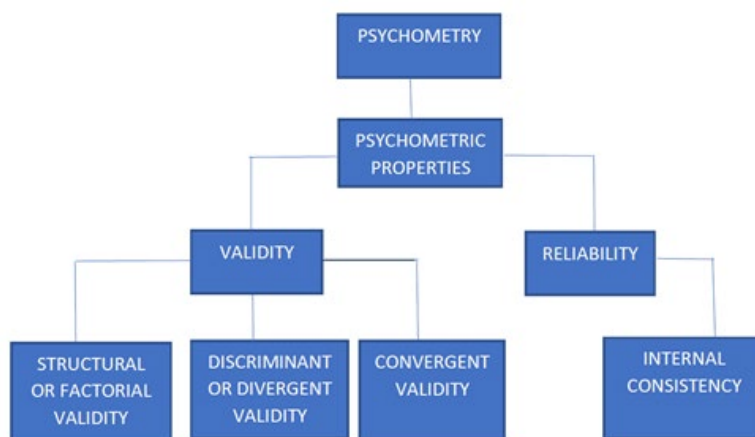
Divergent or discriminant validity is an alternative to testing the hypothesis that the measures performed by the instrument are not unduly associated with different constructs. The degree to which the scale discriminates with variables from which it should be differentiated is calculated. This validity consists of the degree to which a measure does not correlate with other measures from which it is supposed to diverge [12]. Also, in relation to this validity, careful planning of the validation process must be carried out during the development of the instrument to

collect, at the same time, the necessary data. The correlations between the measures involved in this process can be presented through a matrix called multi-concept, multi-method or multi-method, multi-trace [12]. It tests the hypothesis that the target measurement is not unduly related to different constructs, that is, to variables from which it should differ. In the context of psychometrics, it is also necessary to understand the object called reliability, which refers to the degree of consistency with which the instrument's items measure the proposed attribute free from measurement error and the degree to which the instrument allows reproduction and obtaining consistent results, when applied on different occasions, except for random errors. If there is an absence of errors in the measurement or if these are minimized, the measurement can be considered reliable.

In the literature consulted, reliability is also referred to as precision, agreement, equivalence, consistency, objectivity, reliability, constancy, reproducibility, stability, trust and homogeneity, and these are expressions also used to establish the reliability of the measurement scale. The use of these terms varies according to the aspect of the test that one wants to highlight and the literature used. The study of 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 the homogeneity of the items, that is, the extent to which the items measure the same attribute and produce consistent results. The analysis of internal consistency becomes possible for instruments composed of multiple items applied on a single occasion. To this end, the internal consistency of the total number of items (unidimensional

instruments) can be assessed or according to subscales that make up the instrument, which can be multidimensional.

Among the most commonly used forms of analysis to calculate the internal consistency of a measuring instrument are the split-half or bipartition tests, Kuder-Richardson and Cronbach's alpha coefficient. In this research, Cronbach's alpha test was used. Cronbach's alpha is a technique in which item variances are based on discrete numerical scores that represent the different possibilities for each item of the instrument. It is assumed that the scale is composed of homogeneous elements randomly selected from the population and that the elements evidence the same characteristic. Cronbach's alpha is recommended for measuring instruments that adopt Likert-type or multiple-choice scales whose categories present an increasing or decreasing order of values. When using Cronbach's alpha, several of its characteristics must be considered: alpha provides a single value for any data set and provides the value for the mean of the distribution of all possible coefficients of the parts that make up the instrument, thus representing an association for the established data set. Furthermore, it does not depend solely on the magnitude of the correlation between the items, but rather on the number of items on the scale. If the number of items on 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 may indicate the existence of a high level of redundant items. Figure shows the psychometric methodological framework used in the present study.



source author of the study

Figure: Psychometry Methodological Framework

2.3. Study Participants, Sample and Sampling

Data collection was carried out with elderly individuals, aged 70 years or older, of both sexes and living in their residences in the cities of Itajubá, Piranguinho, Pouso Alegre and Santa Rita do Sapucaí, all located in the state of Minas Gerais (MG). They were located and interviewed in their homes. The sample size was 1200 participants, distributed as follows in the mentioned cities: 450 elderly individuals in Itajubá, 100 in Piranguinho, 650 in Pouso Alegre (400 interviewees from the community and 200 hospitalized in the various units of a university hospital in

the city) and 200 in Santa Rita do Sapucaí. The criterion used to establish the size of the subsamples was the number of elderly people per city. The number of participants in this study was also calculated to obtain stable factor solutions. For this purpose, the "items/subject ratio" criterion was used. According to Pasquali, a minimum ratio of five to one regarding the sample size and the number of items constituting the scale is necessary for an appropriate survey of the psychometric characteristics that can be revealed from factor analysis [12]. The scale, constructed, had 25 items, and approximately 48 participants were used per item.

Sampling was of the non-probabilistic type for convenience or accidental and “snowball”.

2.4. Inclusion and Exclusion Criteria

The following inclusion criteria were adopted: elderly people with preserved cognitive and communication capacity, which was identified by applying the Mental Assessment Questionnaire and only those who lived in the community [13]. Elderly people who were in a situation of frailty and bedridden were excluded.

2.5. Data Collection

The following research instruments were used to collect data

1. Mental Assessment Questionnaire, which was used for mental assessment in the inclusion criterion. It was proposed by Khan and later adapted to Brazilian culture by Ventura and Bottino, and is in the public domain [13]. The aforementioned questionnaire consists of 10 questions that focus on temporal-spatial orientation, in addition to memory for later facts.

2. Instrument for characterizing basic conditioning factors of elderly people (ICFCBPIs), developed by Silva and which characterizes elderly people based on their sociodemographic profiles such as: age, sex, marital status, religion, work, among others [14]. It consists of open and closed questions

3. Self-Care Action Scale with Focus on Basic Activities of Daily Living (EACAC-ABVD), which was developed based on Orem's Self-Care Deficit Nursing Theory, specifically on the concepts of self-care capabilities and actions. It is made up of four domains:

- i) Body hygiene activities
- ii) Eating and oral hygiene activities
- iii) Movement activities; and
- iv) Personal appearance activities.

The EACAC-ABVD scale consists of 25 items with the following response options and their respective number of points: total help (1); partial help (2) and no help (3 points). In this context, the minimum number of points corresponds to 25 and the maximum to 75, knowing that the highest score reveals better practices or participation in Basic Activities of Daily Living; and

4. Scale to Assess Self-Care Capabilities (EACAC) which obtained evidence of psychometric properties appropriate to the Brazilian reality. It consists of 24 items, with the following response options and their respective number of points: I totally disagree (1); I disagree (2), I neither agree nor disagree (3), I agree (4) and I totally agree (5 points). The minimum number of points is 24 and the maximum is 120. The closer to 120, the better the self-care capabilities and vice versa.

2.6. Pilot Study

To conduct the pilot study, 5% of the total sample, which corresponded to 70 elderly individuals living in Itajubá, MG, was used. The participants in this study were not part of the final sample, but met the inclusion criteria. They had no difficulty understanding the items. The average time to apply the instruments was 30 minutes, and this study was also an opportunity to prepare the interviewers for the final data collection. It is worth mentioning that five nurses were invited and duly trained to collect data.

2.7. Data Analysis

To obtain the data, a database was created and “fed” using the SPSS (Statistical Package for the Social Sciences) software, version 22.0. Regarding data analysis, descriptive statistics were used (frequency and percentage for categorical or qualitative variables) and measures of tendency and central dispersion for numerical or continuous variables.

The following statistical procedures were also used in this study:

- Exploratory Factor Analysis (principal axes) with varimax rotation, to verify the behaviour of the domains and items regarding their permanence or not as integral elements of the Basic Activities of Daily Living Scale. The requirements for maintaining the item in the scale were the following: factor loading = 0.6, however, the clinical meaning of the item in question was also taken into consideration, as well as the analysis of Cronbach's alpha. In other words, the alpha was analysed according to the presence of the item. If the item interfered positively in the alpha result, it was maintained or vice versa. The KMO test (Kaiser Meyer Olkin) was used to measure the adequacy of the use of Factor Analysis and the Bartlett sphericity test to measure whether Factor Analysis was appropriate for the problem in question.

- To verify the reliability regarding the internal consistency of the total EACAC-ABVD scale and its domains, Cronbach's Alpha was used. The minimum acceptable value for Alpha was 0.7 or higher [15-17].

- Pearson's Correlation Index was used to assess the homogeneity of the scale under validation. Convergent validity was performed between the EACAC-ABVD scale and the Scale to assess self-care capabilities, using Spearman's Correlation Index. Discriminant validation was developed using nonparametric tests (Mann-Whitney and Kruskal-Wallis) through comparative analysis of the variables: age group and education with the EACAC-ABVD.

- The correlation value between the variables was classified as follows, according to the categories: for r values between 0.00 and 0.19, a very weak correlation was considered; an r value of 0.20 to 0.39 indicated a weak correlation; a moderate correlation comes from an r value between 0.40 and 0.69; a strong correlation has an r value of 0.70 to 0.89; and, finally, an r value of 0.90 to 1.00 suggests a very strong correlation [18]. The significance level adopted was equal to or less than 0.05 (5%).

2.8. Ethical Aspects of Research

In this study, ethical aspects were considered in accordance with Resolution 466/12 of 2012 of the National Health Council (CNS) of the Ministry of Health, which deals with research involving human beings. This study was approved by the Research Ethics Committee (CEP) of the University of Vale do Sapucaí (UNIVÁS), under the consolidated opinion no. 2,734,851 of 2018.

3. Results

Regarding sociodemographic characteristics, it was found that: 58.5% were female; 88.3% of participants were under 85 years old; 38.0% were married; 61.2% had completed or incomplete elementary education; 39.2% considered themselves

to be in good health; 58.0% did not practice physical activities; 96.1% participated in social activities and 82.3% did not have any disability or physical impairment. The following data are presented related to exploratory Factor Analysis, internal consistency, convergent and discriminant validity of the EACAC-ABVD. To study the adequacy of the application of Factor Analysis, the KMO Test was performed, and the value found was 0.944 (adequate when > 0.5). The Bartlett's sphericity test was also developed, which is adequate when significant

($p \leq 0.05$). The p-value found was <0.001. Both tests resulted in the Factor Analysis being adequate for the data collected. To select the Main Domains that represented the set of Domains, eigenvalues above 1 were considered. Thus, four domains resulted from this process. To select the variables in each of the four Domains, the factor loadings after Varimax rotation with a value equal to or above 0.5 were used. Each of the 25 variables was allocated to one of these Domains, as shown in Table 1.

Items		Factor loadings			
		1	2	3	4
1	I put on my socks.	0,745	0,265	0,136	0,266
2	I take my medicine.	0,475	0,273	0,308	0,278
3	I take off the clothes on my upper body.	0,661	0,450	0,268	0,142
4	I take off the clothes on my lower body.	0,794	0,335	0,272	0,161
5	I take off my shoes and slippers.	0,779	0,295	0,245	0,171
6	I put on the clothes on my upper body.	0,694	0,428	0,299	0,154
7	I put on the clothes on my lower body.	0,790	0,308	0,302	0,190
8	I put on my shoes and slippers.	0,825	0,227	0,248	0,186
9	I take a shower.	0,678	0,287	0,410	0,138
10	I wash my feet in the shower.	0,754	0,169	0,333	0,237
11	I tie and untie my shoelaces.	0,810	0,107	0,189	0,306
12	I button and unbutton my shoes.	0,842	0,143	0,187	0,287
13	I go in and out of the bathroom, do my personal hygiene and put on or straighten my clothes.	0,713	0,275	0,415	0,119
14	I take food from my plate to my mouth.	0,193	0,888	0,169	0,100
15	I take a glass of liquid to my mouth.	0,214	0,887	0,169	0,096
16	I brush my teeth.	0,400	0,719	0,222	0,165
17	I comb my hair.	0,371	0,770	0,183	0,171
18	I go from bed to chair (armchair or wheelchair) and vice versa.	0,516	0,341	0,568	0,083
19	I walk inside the house.	0,469	0,390	0,604	0,087
20	I walk outside the house.	0,282	0,198	0,749	0,176
21	I go up and down stairs.	0,237	0,128	0,794	0,153
22	I get in and out of the car or the bus.	0,230	0,112	0,799	0,185
23	I shave.	0,308	0,272	0,051	0,412
24	I cut my fingernails.	0,239	0,197	0,229	0,838
25	I cut my toenails.	0,298	0,033	0,217	0,823

Source: EACAC-ABVD (2021).

Table 1: Items with their Respective Factor Loadings and Groupings of Variables

Since all items originating from the scale were adopted in the exploratory factor analysis, there was no need for clinical evaluation to remove or maintain them. To verify the internal consistency of the Domains, Cronbach's Alpha coefficient was

adopted and values equal to or above 0.7 were considered for the continuation of the study. These values are shown in Table 2, in addition to the confidence interval.

	Domains	Cronbach's Alpha Coefficient	95% Confidence Interval
1	Personal hygiene activities	0,968	(0,965; 0,970)
2	Feeding and oral hygiene activities	0,924	(0,917; 0,931)
3	Movement activities	0,882	(0,871; 0,892)
4	Personal appearance activities	0,717	(0,688; 0,744)
	Full scale	0,961	(0,958; 0,964)

Source: EACAC-ABVD (2021).

Table 2: Domains and Respective Cronbach's Alpha Coefficients and Confidence Intervals

Following the study, the results of the scores of the Basic Scales of the Exploratory Factor Analysis are presented, resulting in a Total Scale (identified as total score) and 4 subscales identified here as Domain 1, Domain 2, Domain 3 and Domain 4. A study of the Normality of the Domains resulted in non-adherence to

the Gaussian Curve, therefore non-parametric tests were used in the comparisons. To perform the discriminant validity, the relationship between the sociodemographic and health variables with the EACAC-ABVD was used (Tables 3 and 4).

		Age Range		Tests
		≤ 85	86+	Mann-Whitney (p)
Domain 1: Personal hygiene activities	Mean	37,9	34,9	
	Median	39,0	39,0	<0,001*
	Standard Deviation	3,5	7,0	
	n	1060	140	
Domain 2: Feeding and oral hygiene activities	Mean	11,9	11,5	
	Median	12,0	12,0	<0,001*
	Standard Deviation	0,6	1,6	
	n	1060	140	
Domain 3: Movement activities	Mean	14,2	12,6	
	Median	15,0	14,0	<0,001*
	Standard Deviation	1,6	3,0	
	n	1060	140	
Domain 4: Personal Appearance Activities				
	Mean	8,4	7,7	
	Median	9,0	9,0	<0,001*
	Standard Deviation	1,1	1,6	
Total score	n	1060	140	
	Mean	72,5	66,6	
	Median	75,0	73,0	<0,001*
	Standard Deviation	5,9	12,0	

Source: EACAC-ABVD (2021).

Table 3: Age Range Related to EACAC-ABVD

		Education							Kruskal–Wallis tests (p)	Results
		None/ does not know how to read and write	Incomplete elementary school	Completed elementary	Incomplete high school	Completed high school	Incomplete higher education	Completed higher education		
Domain 1	Mean	37,2	37,3	37,1	38,2	38,1	38,6	38,2		*
	Median	39,0	39,0	39,0	39,0	39,0	39,0	39,0	0,051	
	Standard Deviation	4,6	4,6	4,7	3,2	3,3	1,4	2,6		
	n	109	600	134	49	130	13	165		
Domain 2	Mean	11,8	11,8	11,8	12,0	11,9	12,0	12,0		*
	Median	12,0	12,0	12,0	12,0	12,0	12,0	12,0	0,315	
	Standard Deviation	1,2	0,8	1,1	0,1	0,6	0,0	0,2		
	n	109	600	134	49	130	13	165		
Domain 3	Mean	13,6	14,0	13,5	14,2	14,4	14,4	14,6		**
	Median	15,0	15,0	14,0	15,0	15,0	15,0	15,0	<0,001*	
	Standard Deviation	2,3	2,0	2,0	1,6	1,5	1,4	1,2		
	n	109	600	134	49	130	13	165		
Domain 4	Mean	8,4	8,3	8,3	8,4	8,5	8,5	8,6		*
	Median	9,0	9,0	9,0	9,0	9,0	9,0	9,0	0,071	
	Standard Deviation	1,1	1,3	1,4	1,1	1,3	1,0	0,9		
	n	109	600	134	49	130	13	165		
Total Score	Mean	71,0	71,4	70,7	72,8	72,9	73,5	73,4		***
	Median	74,0	74,0	73,0	75,0	75,0	75,0	75,0	<0,001*	
	Standard Deviation	8,3	7,6	8,1	5,5	5,8	2,8	4,2		
	n	109	600	134	49	130	13	165		

*None/Cannot read or write = Incomplete elementary school = Complete elementary school = Incomplete high school = Complete high school = Incomplete higher education = Complete higher education.
**None/Cannot read or write < Complete high school = Complete higher education; Incomplete elementary school < Complete higher education; Complete elementary school < Complete high school = Complete higher education.
*** Incomplete elementary school = Complete elementary school < Complete higher education

Source: EACAC-ABVD (2021)

Table 4: Education Related to EACAC-ABVD

As shown in Table 5, for convergent validation, the Spearman ABVD scale and the Self-Care Capabilities Assessment Scale Correlation Coefficient was calculated between the EACAC- (EACAC).

Domains		Score	
1)	Personal hygiene activities	Correlation Coefficient	0,275
	Sig. (p)	<0,001*	
	n	1200	
2)	Feeding and oral hygiene activities	Correlation Coefficient	0,225
	Sig. (p)	<0,001*	

	n	1200	
3)	Movement activities	Correlation Coefficient	0,196
	Sig. (p)	<0,001*	
	n	1200	
4)	Personal appearance activities	Correlation Coefficient	0,106
	Sig. (p)	<0,001*	
	n	1200	
Full scale	Correlation Coefficient	0,203	
	Sig. (p)	<0,001*	
	n	1200	

Source: EACAC-ABVD (2021)

Table 5: Spearman Correlation between EACAC-ABVD and EACAC

4. Discussion

This study also aimed to analyse the psychometric properties of the scale, such as structural validity through Exploratory Factor Analysis, reliability through internal consistency or homogeneity, and convergent and discriminant validity of the EACAC-ABVD. The results from this study showed acceptable or adequate psychometric properties. Therefore, this is a valid scale for the purposes for which it is proposed. Through Exploratory Factor Analysis, the EACAC-ABVD scale was structured with 25 items and four domains, entitled: Personal appearance activities refer to the capabilities and actions that people have to perform activities related to their personal appearance to remain presentable to other people and their self-esteem (items: 1-13); Eating and oral hygiene activities are characterized by the capabilities and actions that the person has in feeding themselves through their physical movements (items: 14-17); Movement activities refer to the capabilities and actions that people have in moving from one place to another through their physical activities (items: 18-22); Personal hygiene activities relate to the capabilities and actions that people have to perform their personal and daily hygiene (items: 23-25).

To evaluate the measurement model, it is common to verify the convergent and discriminant construct validities. In convergent validity, the items indicating a specific construct must have a high proportion of variance in common [12]. Cohen et al., reported that construct validity is a judgment about the adequacy of conclusions drawn based on test scores for individual positions in a variable called a construct [19]. This constitutes a comprehensive validity that analyses how test scores relate to other scores and measures, and how test scores can be interpreted within the scope of a theory to understand the construct that the test is designed to measure.

For the convergent validation of the scale under study, Spearman's correlation between the EACAC-ABVD and the EACAC was used. Hutz et al., and Pollit, Beck described that when carrying out an in-depth study of construct validity, it is important to know whether the instrument evaluated relates to other variables as expected and theoretically indicated [20]. In a correlation between two instruments, regarding convergent validity, it is essential that there is at least a weak correlation

between the two scales and a minimum significance level of 0.05 [18]. Although Spearman's correlations are predominantly weak, the significance level was high between the two scales, with a p-value <0.001. In the study carried out by Dias et al., the convergent validity between the Advanced Activities of Daily Living scales and the Vitor Quality of Life Assessment Scale for Elderly People presented similar results through weak correlations and high significances both in the total scale and in its domains [21]. The work carried out by Silva and Baptista corroborated the present study when it was observed that the convergent analysis between the Vitor Quality of Life Scale for Elderly People and the Baptista Depression Scale presented weak correlations and high significances [22]. Araújo et al., correlated the Barthel index with the Lawton and Brody scale, presenting a positive correlation ($r = 0.84$) and statistically significant ($p < 0.01$) [23]. It was observed that the correlation results did not coincide with the present investigation.

Discriminant validity is the degree to which a construct differs from others [12]. This approach was also used in the present study to assess the construct validity of the EACAC-ABVD. Several contrasting groups were found to have significant statistical differences, which prove that the Basic Activities of Daily Living discriminate groups that are in different states or situations. Discriminant construct validity refers to the extent to which the scores obtained with the application of an instrument distinguish individuals or populations in which differences are expected. An example is: people with and without pain. This validity does not require that the construct correlate with dissimilar variables [12]. In the present study, there were significant differences between the BADLs with the following variables: age group and education. The results of the study carried out by Dias et al., referring to the discriminant validation of the Advanced Activities of Daily Living Scale in the Brazilian reality with the same variables, corroborate the data of this work [21]. The study developed by Silva and Baptista related to the discriminant validation of the Vitor Quality of Life Scale obtained results similar to those presented here [22].

In the present study, from the point of view of reliability, the internal consistency through Cronbach's alpha demonstrated psychometric properties suitable for the use of the EACAC-

ABVD, since the total scale and its domains presented figures above 0.70 [15-17]. It should be noted that the Alpha value for the total scale was above 0.9, indicating high internal consistency. Similarly, in the context of Basic Activities, two studies corroborated the findings of the present work. The research developed by Gallasch et al., validated the Katz index to the Brazilian reality with patients diagnosed with cancer, having good reliability with a Cronbach's alpha of 0.97 [24]. Araújo et al., in turn, validated the Barthel Index with non-institutionalized elderly people, obtaining a high Cronbach's alpha value of 0.96 [23].

The present study was limited to the construction and evaluation of psychometric properties among elderly people from cities in the south of the state of Minas Gerais. It is known that Brazil has diversifications, with cultural, social and leisure diversities in the different regions of the country, which can make certain basic activities unique or specific to the Brazilian reality.

5. Conclusions

The psychometric properties of the EACAC-ABVD presented adequate evidence, which proves that the aforementioned scale is available for use in the Brazilian reality. The scale will be a tool for researchers, filling knowledge gaps regarding self-care actions with a focus on Basic Activities of Daily Living with a view to aging. This resource is also intended for the clinical evaluation of elderly people in the nursing care process and other interdisciplinary areas devoted to this subject. The results from this scale will be important tools to be applied in the context of research treatments and also in the clinical sphere [25-70].

Ethics Committee

Consolidated opinion No. 2,734,851 of 2018. Research resulting from a postdoctoral thesis.

Informed Consent Form (ICF)

All participants signed the ICF before the interview, giving their consent to the interview.

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