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Research Article

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The Development and Evidence of Psychometric Properties of the Self-Care Activities Scale Focusing on the Daily Life Advanced Activities

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Abstract

Objective

To develop the Self-Care Activities Scale focusing on the Daily Life Advanced Activities (SCCAS-DLAAs) and to analyze its psychometric properties.

Method

This was a methodological, descriptive, and analytical study. The sample consisted of 1200 interviewees of both sexes, aged 70 years or older, residents in cities in southern Minas Gerais state, Brazil. The instruments used were as follows: an instrument to classify the baseline conditioning factors of elderly people, the SCCAS-DLAAs, and the Self-Care Skills Assessment Scale.

Results

The SCCAS-DLAAs consisted of 20 items and four domains, namely: Social (α Cronbach = 0.768), Leisure (α Cronbach = 0.643), Intellectual (α Cronbach = 0.708), and Religious (α Cronbach = 0.704). Convergent validity was satisfactory as it showed a positive and significant correlation ($p \leq 0.001$). For discriminant validation, the comparative analyses of the sociodemographic variables with the SCCAS-DLAAs were used, presenting a significance level between them, which demonstrated discriminative power.

Conclusion

The developed scale showed adequate reliability and validity for the Brazilian context

Keywords: Daily Life Advanced Activities, Self-Care Activities, Psychometric Properties

1. Introduction

The concept of Daily Life Advanced Activities (DLAAs), first proposed by, includes a set of social, productive, and leisure activities related to participation and social engagement that exceed those of self-care, survival, and practical problem solving, in addition to connecting older people to broader and more complex social roles [1,2]. For engaging in these activities, autonomy and independence are required of the elderly individuals, requiring sufficient physical and cognitive behavioral abilities from them [3-5]. These activities enable elderly people to be perceived as participatory and engaged, active and productive, as well as to engage in multiple social roles [6-8]. Functional capacity through physical activities inherent to basic, instrumental, and advanced activities of daily life is one of the main ways to prevent, minimize, and/or reverse most of the functional, social, and psychological declines that often affect the elderly [9].

Neri and Vieira (2013) advocate the importance of studies on DLAAs, since deficits in this category are precursors to losses in Daily Life Instrumental Activities (DLIAs) and Daily Life Basic Activities (DLBAs). However, there is variability of activities related to the concept and diversity of instruments and methodologies used to measure these activities, which include, for instance, objectively testing the ability to stroll, walk, go to social meetings, attend church services, watch television, or measuring, based on self-report, their participation in activities such as: taking care of a grandchild, giving advice to their families, and reading a newspaper. Thus, no standardization exists, which hinders the comparison of the results of different studies [10-13].

DLAAs are important strategies for the maintenance of community life and stimulation of physical, cognitive, and social functions during the aging process. The challenges presented by the elderly in DLAAs may be predictors of progressive functional decline at an early stage [14]. In clinical practice, the evaluation of DLAAs is not carried out systematically and has not yet been incorporated into gerontological evaluations. The lack of knowledge regarding these daily life activities and the absence of available instruments may be the main reasons. The performance of DLAAs is related to reduced risk of death, depressive symptoms, cognitive impairment, and developing disabilities, and this can only be identified through the availability of valid and reliable instruments.

Dias et al. (2015) emphasize the need for validating an instrument to assess the DLAAs and the follow-up sequence, aiming to assess the stability of the effect of these activities over time. In addition, the development of a scale of self-care activities focused on DLAAs is an instrument that may be used as a health indicator and, when analyzed, may effectively contribute to the assessment of the health conditions of the elderly.

The assessment of functional capacity, which is an indicator of healthy and active aging, is commonly assessed through daily life activities, and among them are the advanced activities. It is worth noting that the aforementioned activities represent in the Self-Care Deficit Nursing Theory (SCDNT) the self-care actions or practices that anchor the DLAAs.

Self-care activities are among the core SCDNT concepts, which consist of practices or activities that people initiate and perform deliberately and for their own benefit in order to maintain life, health, and well-being (quality of life). Self-care practices are learned and demonstrated behaviors and are determined by several factors, including the culture of the group to which an individual belongs. This skill is developed through health education, which is an essential component of nursing care and is directed to the promotion, maintenance, and restoration of health and disease prevention [15].

Self-care activities are influenced by Self-Care Capabilities (SCC). These two concepts are closely related and associated. However, there is no self-care activities scale that measures basic, instrumental, and advanced daily life activities of the elderly to the best of our knowledge.

In a review study, Dias et al. (2011a) analyzed 35 scientific studies published between 1984 and 2008, where the DLAAs terminology was used. The authors found that, after 24 years, there was no conceptual and theoretical progress, nor the development of validated instruments that could measure the performance of individuals performing these activities. The authors highlighted the cited studies' tendency of being based on the same definition by Reuben and Solomon (1989) regarding the DLAAs. This situation lasts until the present date, when the development of specific instruments for DLAAs has not been carried out, especially in Latin America and Brazil. It is also worth mentioning that there is no mention in the literature of the association of self-care activities with DLAAs.

The development and validation of a scale will be a resource for research in this area at the interdisciplinary level, as well as for the nursing care process from the perspective of self-care and daily life activities assessment. In the context of aging, the performance of self-care activities focused on DLAAs is extremely important and meaningful. In addition, the novel knowledge stemming from this study regarding the DLAAs related to self-care was unprecedented, thus providing novel knowledge and conceptions regarding this area. The present study may represent the evolution of knowledge in this area regarding the development of the DLAAs scale and spark the interest of new researchers towards this phenomenon.

In this context, the present study's objectives were to develop the Self-Care Activities Scale focusing on the Daily Life Advanced Activities (SCCAS-DLAAs) and to analyze its psychometric properties.

2. Method

2.1 Development of the Self-Care Activities Scale Focusing on the Daily Life Advanced Activities (SCCAS-DLAAs)

To develop the Self-Care Activities Scale focusing on the Daily Life Advanced Activities (SCCAS-DLAAs), initially a literature review on the Daily Life Advanced Activities was carried out. For this, the following authors were selected: Municipal Secretary of Porto [16-30].

Regarding the use of the Self-Care Deficit Nursing Theory in the development of the aforementioned scale, the following authors were selected [31-42].

From the Self-Care Deficit Nursing Theory (SCDNT), the following concepts were selected: 1- Self-care activities and self-care capabilities, regarding these two concepts as interrelated, as mentioned by Orem (2006); 2- Therapeutic demand for self-care.

The self-care activities were represented by the DLAAs. These items were elaborated based on the literature review regarding health promotion, functional capacity, and active aging, whose authors have already been mentioned above, and the following functional capacity scales were used: the Katz Index; the Barthel Scale; the Lawton-Brody Scale; the Extended instrument for socio-functional assessment in the elderly (EISFAE), the FADA GERMI, which is a document of the Geriatrics Research Center of the Portuguese Society of Internal Medicine, which addresses broad geriatric assessment, containing the most diverse instruments of this nature, and the inventory and list found in the literature on DLAAs. All the documents that provided the basis or rationale for the elaboration of the aforementioned scale were previously presented.

The DLAAs present the following response options: "I have never done (1 point)", "I no longer do (2 points)", and "I do (3 points)". The reasons that led to the selection of these options were to assess whether the person has never had the opportunity to do them or no longer does them due to some disability or if they still do them because they have the functional capacity for such activities. The scale was developed based on four domains, namely: 1) Productive; 2) Leisure; 3) Intellectual; and

4) Religious. The items for each domain were created based on the concepts of capabilities and self-care activities from the SCDNT. It is also worth noting that each item is presented in line with the Daily Life Advanced Activities.

After performing the previous procedures, the first version of the Self-Care Activities Scale focusing on the Daily Life Advanced Activities (SCCAS-DLAAs) was developed. Following this, the analysis of the developed version was performed, as follows: 1) construct relevance, and 2) semantic, idiomatic, conceptual, and cultural analysis. For these analyses, the Focus Group (FG) technique was used [43].

To compose the Judges' FG, six professors from the University of Vale do Sapucaí (UNIVAS), Pouso Alegre, MG, were invited, two of them from the nursing program, who are knowledgeable in the Self-Care Deficit Nursing Theory, and four from other areas, but with knowledge and experience in Gerontology. This group evaluated, discussed, and expressed opinions on each item of the SCCAS-DLAAs, until consensus was reached among all those present. To accomplish this task, the selected judges were specialists in the topic in question, since they were responsible for judging whether or not the items were related to the construct. A number of six judges is sufficient for this judgment, and there should be at least 80% agreement between them for each item [44]. All participants were informed of the FG session and all their doubts were addressed, and they signed the Informed Consent Form (ICF).

To carry out the semantic analysis, the FG was composed of 14 participants, both males and females, aged 60 years or older, residents of Itajubá, MG, with three participants with an education level equivalent to incomplete and complete elementary school education (three participants from each of the two levels), as well as two participants for each of the following levels of education: incomplete and complete middle school; incomplete and complete high school. Similarly to the previous FG, all participants were briefed about the FG session, and all questions were answered. This analysis aims to verify that all items are understandable to all members of the target population.

Two FG sessions were held for the Elderly People Group that assisted the semantic analysis. The moderator of the FGs was the first author of this study who received help from two professors and two masters' students in Bioethics.

2.2 Study Design, Study Participants, Sample and Sampling

This was a methodological, descriptive, and analytical study. Data collection was carried out with elderly people, aged 70 years or older, of both sexes, and who lived in their homes in the cities of Itajubá, Piranguinho, Pouso Alegre, and Santa Rita do Sapucaí, all of which are located in the state of Minas Gerais (MG). They were reached in their homes, workplaces, town squares, churches, and other places that were suitable, according to their choice. The sample size consisted of 1200 interviewees, distributed in the mentioned cities as follows: 450 elderly people in Itajubá, 100 in Piranguinho, 650 in Pouso Alegre (400 interviewees from the local community, and 200 hospitalized patients in the several units of a university hospital in the city), and 200 in Santa Rita do Sapucaí.

The criterion used to establish the size of the sub-samples was the number of elderly people per city according to the Brazilian Institute of Geography and Statistics – BIGS [45]. The number of participants in this study was also calculated to reach stable factorial solutions. For this purpose, the criterion "items/subject ratio" was used. According to Pasquali (2010), a minimum ratio of five to one regarding the sample size and the number of items of the scale is necessary for an appropriate survey of the psychometric properties that can be found from the factor analysis. The scale developed, consisting of 39 items, included approximately 40 participants per item. Sampling was of the non-probability by convenience or accidental and "snowball" type.

2.3 Inclusion and Exclusion Criteria

The following inclusion criteria were adopted: elderly people with preserved cognitive and communication skills (which was identified by applying the Mental Assessment Questionnaire), and only those who lived in the local community. Elderly people who were frail and bedridden were excluded.

2.4 Data Collection

For data collection, the following research instruments were used: 1 – Instrument for the classification of the basic conditioning factors in the elderly (ICBCFE). This instrument was developed by, and it classifies the elderly people by profiling their sociodemographic aspects such as: age, sex, marital status, religion, occupation, and so on. It consists of open and closed questions; 2 – Self-Care Activities Scale focusing on the Daily Life Advanced Activities (SCCAS-DLAAs), and its development was based on Orem's Self-Care Deficit Nursing Theory, specifically the self-care skills and activities concepts [46]. It consists of four domains, namely: productive, leisure, intellectual, and religion. The SCCAS-DLAAs scale consists of 20 items with the following response options: "I have never done (1 point)", "I no longer do (2 points)", and "I do (3 points)". In this context, the minimum score corresponds to 20 and the maximum to 60 points, whereby higher scores indicate better practices or participation in the daily life advanced activities; and 3 – Self-Care Capacity Assessment Scale (SCCAS), which presented evidence of psychometric properties suitable for the Brazilian context [47]. It consists of 24 items, with the following response options: strongly disagree (1 point), disagree (2 points), neither agree nor disagree (3 points), agree (4 points), and strongly agree (5 points). The minimum score is 24 and the maximum is 120 points. The closer to 120, the better the self-care skills, while the closer to 24, the worse the skills are.

2.5 Pilot Study

For the pilot study, 5% of the total sample was used, which corresponded to 70 elderly people living in Itajubá, MG. This study's participants were not part of the final sample, but were compliant with the inclusion criteria. They had no difficulties understanding the items.

2.6 Data Analysis

For data collection, a database was prepared and "fed" using the SPSS (Statistical Package for the Social Sciences) software, version 22.0. Regarding data analysis strategies, descriptive statistics were used (frequency and percentage for categorical

variables), and measurements of central tendency and dispersion for numerical or continuous variables.

The following statistical procedures were also used in this study

• Exploratory Factor Analysis (main axes) with varimax rotation, to verify the behavior of the domains and items as to whether or not they would remain as integral elements of the Scales of the Daily Life Advanced Activities. The requirements for maintaining the item in the scale were the following: factor load = 0.6, however, the clinical aspect of the item in question was also considered, along with the analysis of Cronbach's alpha. That is, the alpha was analyzed according to the presence of the item. If the item interfered positively in the alpha result, it was maintained, or vice-versa. The KMO (Kaiser Meyer Olkin) test was used to measure the suitability of using the Factor Analysis and Bartlett's sphericity test to measure whether the Factor Analysis was adequate to the problem in question.

• To verify the reliability regarding the internal consistency of the SCCAS-DLAAs scale, in total and in its domains, Cronbach's alpha was used. The minimum acceptable value for the Alpha was 0.7 or higher.

• The Pearson Correlation Coefficient was used to assess the homogeneity of the scale under validation. Convergent validity was performed using Spearman's rank correlation coefficient, by using the Self-care Capacity Assessment Scale. The discriminant validation was developed by using non-parametric tests (Mann-Whitney and Kruskal-Wallis) through the comparative analysis of the variables, namely: education, health assessment, physical activity, social activity, and disability or physical impairment with the SCCAS-DLAAs.

The value of the correlation 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 indicates a weak correlation; a moderate correlation stems 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 [48]. The significance level adopted was equal to or less than 0.05 (5%).

2.7 Ethical Aspects of the Research

In the present study, the ethical aspects were complied with according to Resolution 466/12, 2012, of the National Health Council - NHC (Conselho Nacional de Saúde - CNS), of the Ministry of Health that addresses Human-to-Human Ethics. The present study was approved by the Research Ethics Committee (REC) of the University of Vale do Sapucaí, under the consubstantiated legal opinion no. 2,734,851 of 2018.

3. Results

Regarding the sociodemographic properties, it was found that: 58.5% of the participants were female; 88.3% of the sample participants were under 85 years old; 38.0% were married; 61.2% had complete or incomplete elementary school 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.

Next, the data related to the Exploratory Factor Analysis, internal consistency, and convergent and discriminant validity of the SCCAS-DLAAs are presented. To study the suitability of the application of the Factor Analysis, the KMO test was performed, and the value found was 0.854 (adequate when > 0.5). Bartlett's sphericity test was also used, which is adequate when significant ($p<=0.05$). The p-value found was <0.001*. Both tests resulted in the Factor Analysis being adequate for the data collected.

For the selection of the Main Domains that represented the set of Domains, the eigenvalues above 1 were considered. Thus, 11 domains resulted from this process, covering 54.6% of the Total Variance. To select the variables in each of the 11 Domains, the factor loadings were used after Varimax rotation.

Question		Domains (Factor Loadings)										
		1	2	3	4	5	6	7	8	9	10	11
9	I go to birthday parties, parties, and events.	0.811	0.070	0.102	0.153	0.079	0.036	0.024	0.102	0.002	0.000	0.065
4	I go to my relatives' and friends' birthday parties.	0.810	-0.008	0.140	0.142	0.080	0.003	0.011	0.055	0.035	-0.006	0.042
1	I visit my relatives or friends.	0.641	0.082	0.020	0.188	-0.025	0.206	0.068	0.070	0.164	0.051	0.053

7	I travel or take tours.	0.575	0.060	0.114	0.199	0.058	0.303	-0.029	0.034	0.099	0.185	0.079
23	I help family members, friends, and neighbors in their needs (to go shopping, going to the bank, accompanying them to medical appointments, and so on).	0.404	0.238	0.239	0.226	0.159	-0.001	-0.295	0.252	-0.077	-0.060	0.170
10	I participate in associations, clubs, and other social institutions (asylums, NGOs, and others).	0.130	0.668	0.152	0.056	0.194	-0.032	0.064	-0.028	-0.036	-0.023	0.048
24	I play a musical instrument.	-0.120	0.502	-0.098	-0.021	-0.090	0.196	0.166	0.010	0.002	0.111	0.154
36	I participate in some type of volunteer work.	0.113	0.478	0.243	0.270	0.074	0.057	0.200	0.181	-0.038	0.038	-0.095
5	I go to parties, to the movies, to concerts, to performances, and to the theater.	0.228	0.469	0.339	0.043	0.268	0.065	0.009	0.093	-0.008	0.006	0.006
22	I collect objects (stamps, coins, and more).	-0.100	0.459	0.027	-0.137	0.058	0.147	0.236	0.075	0.152	-0.026	-0.339
31	I am part of a choir or a dance group.	0.039	0.436	0.101	0.187	0.046	-0.012	0.337	0.056	-0.163	0.059	0.131
6	I can drive a car.	0.166	0.416	0.025	-0.193	0.302	0.182	-0.279	-0.143	-0.107	0.231	0.012

18	I read books, newspapers, and magazines.	0.136	0.086	0.812	0.005	0.085	0.032	0.027	-0.020	0.026	0.176	0.009
19	I write letters, texts, stories, and so on.	0.088	0.140	0.809	0.052	0.105	0.142	0.019	0.018	0.007	0.021	0.000
37	I go to restaurants.	0.326	0.140	0.420	-0.017	0.158	0.321	0.035	0.043	0.072	0.070	-0.066
3	I participate in religious activities in my community (at my friends', neighbors', or relatives' place, and other places).	0.177	-0.001	0.080	0.788	-0.032	0.082	-0.023	0.086	-0.013	-0.085	0.020
28	I go to meetings, parties, celebrations, and events at the church or temple I attend.	0.271	0.095	0.084	0.712	0.086	0.151	-0.002	0.063	0.035	0.046	0.031
8	I go to church.	0.156	0.031	-0.102	0.681	0.041	0.030	0.061	0.012	0.220	0.099	-0.023
30	I go to the gym.	0.118	0.102	0.095	-0.006	0.691	-0.107	0.055	-0.013	-0.008	0.174	-0.069
34	I swim, play soccer, or practice other sports.	-0.038	0.309	0.042	-0.028	0.619	0.128	0.050	0.016	-0.041	-0.045	0.120
29	I practice some form of physical activity (walking, cycling, jogging, and so on).	0.078	-0.079	0.163	0.217	0.596	0.221	0.191	0.014	-0.038	0.031	-0.014
38	I have some kind of paid work.	0.011	0.191	0.128	0.030	-0.034	0.625	-0.028	0.042	-0.118	0.047	-0.009
13	I go for walks in the city or	0.2	0.0	0.0	0.2	0.0	0.5	0.0	0.0	0.1	0.0	0.0

	neighborhood where I live.	87	02	91	76	67	38	52	13	72	21	09
27	I go to the café, public square, or other places to hang out with my friends.	0.338	0.027	0.156	0.084	0.118	0.507	0.133	0.075	0.148	-0.033	-0.110
39	I make life plans/projects.	0.074	-0.033	-0.098	0.109	0.128	0.438	0.118	0.136	0.041	0.427	0.101
32	I play games (chess, dominoes, cards, checkers, bingo, and so on).	0.091	0.231	0.038	-0.016	0.262	0.308	-0.023	0.232	0.081	-0.150	-0.277
12	I am a member of a Senior Citizens group.	-0.023	0.152	-0.022	-0.033	0.073	0.072	0.828	-0.031	-0.005	0.038	-0.122
35	I travel or take tours with a Senior Citizens group.	0.137	0.186	0.065	0.047	0.174	0.053	0.712	0.006	-0.162	-0.029	0.164
15	I take care of my home garden or vegetable garden.	0.138	0.039	0.033	0.129	0.028	0.062	0.010	0.734	0.038	0.144	-0.004
16	I take care of the birds and pets I have at home.	0.078	-0.011	-0.073	-0.022	-0.063	0.146	-0.056	0.732	-0.051	-0.116	0.094
26	I take care of a sick or disabled child, adult, or elderly person.	0.127	0.152	0.222	0.083	0.236	-0.209	0.115	0.362	-0.096	0.003	0.248
14	I watch (see) television and listen to the radio and to music.	-0.150	-0.042	0.105	0.048	0.120	0.151	0.008	-0.038	0.724	-0.117	0.227
2	I welcome visits from relatives or friends in my home.	0.301	-0.043	-0.052	0.095	-0.061	-0.070	-0.042	0.075	0.604	-0.016	-0.052
33	I talk to my friends and neighbors.	0.199	-0.029	-0.008	0.105	-0.173	0.037	-0.150	-0.061	0.499	0.150	-0.131

21	I use my mobile phone to talk to my family and friends.	0.090	0.070	0.258	0.038	0.054	0.140	-0.025	-0.029	-0.100	0.648	0.164
20	I can use the computer.	0.169	0.382	0.177	-0.084	0.325	-0.091	-0.112	-0.009	0.027	0.469	-0.160
17	I do handicrafts (knitting, crochet, sewing, embroidery, painting, woodwork, and others).	-0.116	0.092	0.139	0.125	-0.014	-0.090	0.301	0.357	0.188	0.369	-0.172
11	I participate in parades, political parties, political groups, and political debates.	0.106	0.342	0.285	0.087	0.009	0.162	-0.082	0.001	-0.162	-0.361	0.232
25	I take care of my grandchildren or great-grandchildren.	0.149	0.117	-0.004	-0.018	0.017	-0.013	0.021	0.126	0.079	0.045	0.778

Source: SCCAS-DLAAs (2021).

Table 1: Items with Their Respective Factor Loadings and Variable Groupings

Each of the 39 variables was allocated to one of the 11 Domains, as shown in Table 1. To verify the Domains' internal consistency, Cronbach's Alpha coefficient was adopted and values above 0.6 were considered for the study sequence.

	Domains			
	1	**2**	**3**	**4**
1 I visit my relatives or friends.	0.641			
2 I welcome visits from relatives or friends in my home.	0.301			
4 I go to my relatives' and friends' birthday parties.	0.810			
7 I travel or take tours.	0.575			
9 I go to birthday parties, parties, and events.	0.811			
12 I am a member of a Senior Citizens group.	-0.023			
21 I use my mobile phone to talk to my family and friends.	0.090			
23 I help family members, friends, and neighbors in their needs (to go shopping, going to the bank, accompanying them to medical appointments, and so on).	0.404			
27 I go to the café (pub and snack bar), public squares, and other places to hang out with my friends.	0.338			
33 I talk to my friends and neighbors.	0.199			
35 I travel or take tours with a Senior Citizens group.	0.137			
37 I go to restaurants.	0.326			
5 I go to parties, to the movies, to concerts, to performances, to the theater, and so on.		0.469		
6 I can drive a car.		0.416		

10 I participate in associations, clubs, and other social institutions (asylums, NGOs, and others).		0.668		
13 I go for walks in the city or neighborhood where I live.		0.002		
14 I watch (see) television and listen to the radio and to music.		-0.042		
22 I collect objects (stamps, coins, and more).		0.459		
24 I play a musical instrument.		0.502		
31 I am part of a choir or a dance group.		0.436		
36 I participate in some type of volunteer work.		0.478		
18 I read books, newspapers, and magazines.			0.812	
19 I write letters, texts, stories, and so on.			0.809	
20 I can use the computer.			0.177	
3 I participate in religious activities in my community (at my friends', neighbors', or relatives' place, and other places).				0.788
8 I go to church.				0.681
28 I go to meetings, parties, celebrations, and events at the church or temple I attend.				0.712

Source: SCCAS-DLAAs (2021).

Table 2: Initial Composition of the Domains According to the Researcher's Clinical Perspective and Factor Loadings

For a better clinical perspective of the defined Domains, the possibility of including issues evaluated as important by the researcher was considered, as well as the subsequent analysis from a statistical point of view. This process of including variables of interest resulted in the definition of four new Main Domains presented in Table 2.

Domain 1 - Social Activities						
Items	Cronbach's Alpha					
9 I go to birthday parties, parties, and events.	0.769	0.762	0.756	0.731	0.713	0.686*
7 I travel or take tours.						
4 I go to my relatives' and friends' birthday parties.						
27 27 I go to the café (pub and snack bar), public squares, and other places to hang out with my friends.						
1 I visit my relatives or friends.						
37 I go to restaurants.						
23 I help family members, friends, and neighbors in their needs (to go shopping, going to the bank, accompanying them to medical appointments, and so on).						
2 I welcome visits from relatives or friends in my home.						
33 I talk to my friends and neighbors.						

35 I travel or take tours with a Senior Citizens group.						
21 I use my mobile phone to talk to my family and friends.						
12 I am a member of a Senior Citizens group.						
Domain 2 - Leisure Activities						
Items	Cronbach's Alpha					
10 I participate in associations, clubs, and other social institutions (asylums, NGOs, and others).		0.643		0.628*		
5 I go to parties, to the movies, to concerts, to performances, and to the theater.						
36 I participate in some type of volunteer work.						
31 I am part of a choir or a dance group.						
24 I play a musical instrument.						
22 I collect objects (stamps, coins, and more). 6 I can drive a car.						
13 I go for walks in the city or neighborhood where I live.						
14 I watch (see) television and listen to the radio and to music.						
Domain 3 - Intellectual Activities						
Items	Cronbach's Alpha					
18 I read books, newspapers, and magazines.		0.771		0.644*		
19 I write letters, texts, stories, and so on.						
20 I can use the computer.						
Domain 4 - Religious Activities						
Items	Cronbach's Alpha					
3 I participate in religious activities in my community (at my friends', neighbors', or relatives' place, and other places).		0.704*				
8 I go to church.						
28 I go to meetings, parties, celebrations, and events at the church or temple I attend.						

*Alpha after the insertion of new items.
Source: SCCAS-DLAAs (2021).

Table 3: Clinical Selection of the SCCAS-DLAAs Scale Items

Table 3 presents the clinical selection of the items in the SCCAS-DLAAs scale. Initially, the statistical analysis is presented to define Domain 1, namely Social Activities. In this domain seven variables were included, in addition to the five original ones from the Factor Analysis. Using SPSS, Cronbach's Alpha was evaluated along with whether the removal of each variable could result in a higher Alpha. Therefore, through an interactive process it was possible to remove the variables from the domains that rendered the Alpha weaker (smaller), thus resulting in a domain with seven final variables.

Then, Domain 2 was defined, namely Leisure Activities. In this case, two variables were included, in addition to the original seven from the Factor Analysis. Then, through the iterative process, variables that rendered the Alpha smaller were removed from the Domain. This resulted in a Domain with eight final variables.

The statistical analysis was then used to define Domain 3, namely Intellectual Activities. On the set of the three original variables of the Factor Analysis, there was the inclusion of a variable and the exclusion of another variable. Once again through the interactive process, the variables that render the Alpha weaker were removed from the Domain, resulting in a Domain with two final variables.

For the definition of Factor 4, Religious Activities, through the clinical perspective, there was no need to include or exclude questions. Thus, the three original questions from the Factor Analysis remained, resulting in a Domain with three final variables. At the end of this analysis, the four Final Domains remained.

	Domains				Cronbach's Alpha	95%
	1	2	3	4	coefficient	Confidence Interval
1 I visit my relatives or friends.	0.641				0.769	(0.749 ; 0.789)
4 I go to my relatives' and friends' birthday parties.	0.810					
7 I travel or take tours.	0.575					
9 I go to birthday parties, parties, and events.	0.811					
23 I help family members, friends, and neighbors in their needs (to go shopping, going to the bank, accompanying them to medical appointments, and so on).	0.404					
27 I go to the café, public square, or other places to hang out with my friends.	0.338					
37 I go to restaurants.	0.326					
5 I go to parties, to the movies, to concerts, to performances, and to the theater.		0.469				

6 I can drive a car.		0.416			0.643	(0.611 ; 0.672)
10 I participate in associations, clubs, and other social institutions (asylums, NGOs, and others).		0.668				
13 I go for walks in the city or neighborhood where I live.		0.002				
22 I collect objects (stamps, coins, and more).		0.459				
24 I play a musical instrument.		0.502				
31 I am part of a choir or a dance group.		0.436				
36 I participate in some type of volunteer work.		0.478				
18 I read books, newspapers, and magazines.			0.812		0.771	(0.743 ; 0.795)
19 I write letters, texts, stories, and so on.			0.809			
3 I participate in religious activities in my community (at my friends', neighbors', or relatives' place, and other places).				0.788	0.704	(0.674 ; 0.732)
8 I go to church.				0.681		
28 I go to meetings, parties, celebrations, and events at the church or temple I attend.				0.712		
Scale with all the 20 questions					0.819	(0.804 ; 0.834)

Source: SCCAS-DLAAs (2021).

Table 4: The Domains and Respective Items of the SCCAS-DLAAs, as Well as the Factor Loadings and Cronbach's Alpha Coefficient

After the selection, the statistical selection of the SCCAS-DLAAs items was performed. This selection was based on Cronbach's Alpha values and the confidence interval that are presented in Table 4.

Following the previous study, the results of the Advanced Scale scores are presented. From the Exploratory Factor Analysis emerged a Total Scale (identified as the total score) and 4 subscales identified here as Domain 1, Domain 2, Domain 3, and Domain 4. An analysis of Domain Normality resulted in non-adherence to the Gauss Curve, therefore non-parametric tests were used in the comparisons. To perform discriminant validity,

the relationship between the sociodemographic and health variables with the SCCAS-DLAAs was used (Table 5 and 6).

		Age (Binned)		Mann-Whitney test (p)	Results	Education								Kruskal-Wallis test (p)	Results	Physical activity		Mann-Whitney test (p)	Results
		<= 85	86 +			(1)	(2)	(3)	(4)	(5)	(6)	(7)	Total			Yes	No		
Domain 1	Mean	18.3	16.8		#	16.9	18	17.5	17.9	19	19.1	19.5	18.1	<0.001	(1) < (2) = (3) = (4) < (5) = (6) = (7)	19	17.5	<0.001	*
	Median	19	17			16	19	18	19	20	21	20	19			20	18		
	Standard Deviation	2.7	2.9	<0.001		2.8	2.8	2.7	3.2	2.2	2.5	2.1	2.8			2.3	2.9		
	N	1060	140			109	600	134	49	130	13	165	1200			504	695		
Domain 2	Mean	13.1	13.1		#	11.9	13.2	13.4	14.1	15.1	15.6	16.3	13.8	<0.001	(1) < (2) = (3) = (4) < (5) = (6) = (7)	14.6	13.1	<0.001	*
	Median	13	13	0.008		12	13	13	13	15	16	16	13			14	13		
	Standard Deviation	3.1	2.7			2	2.8	3.1	3	3.1	2.5	2.8	3			3.1	2.8		
	N	1060	140			109	600	134	49	130	13	165	1200			504	695		
Domain 3	Mean	4.5	4.3		##	2.5	4.4	4.5	4.9	5	5.1	5.4	4.5	<0.001	(1) < (2) = (3) < (4) = (5) = (6) = (7)	4.8	4.2	<0.001	*
	Median	5	4	0.237		2	5	4	5	5	5	6	5			5	4		
	Standard Deviation	1.4	1.5			1.1	1.4	1.3	1.3	1.1	0.9	0.9	1.4			1.3	1.5		
	N	1060	140			109	600	134	49	130	13	165	1200			504	695		
Domain 4	Mean	8	7.6		#	7.8	8	7.9	7.9	8.1	8.2	7.9	7.9	0.371	(1) = (2) = (3) = (4) = (5) = (6) = (7)	8.2	7.7	<0.001	*
	Median	9	8	0.003		8	9	8	9	9	9	9	9			9	8		
	Standard Deviation	1.4	1.5			1.3	1.4	1.3	1.6	1.3	1.2	1.5	1.4			1.2	1.4		
	N	1060	140			109	600	134	49	130	13	165	1200			504	695		
Escore total	Mean	44.6	41.9		#	38.7	43.5	43.4	44.7	47.2	48	49.1	44.3	<0.001	(1) < (2) = (3) = (4) < (5) =	46.7	42.6	<0.001	*
	Median	45	41	<0.001		38	44	44	45	48	48	50	45			47	43		
	Standard	6.2	6.7			5	6	6.1	7	5.4	5.3	4.9	6.4			5.4	6.4		

	Deviation														(6) = (7)				
	N	1060	140			109	600	134	49	130	13	165	1200			504	695		

Table 5: Sociodemographic Properties (Age, Education, Physical Activity) Related to the SCCAS-DLAAs

None/Cannot read or write ; (2) Incomplete Elementary School ; (3) Complete Elementary School ; (4) Incomplete High School; (5) Complete High School; (6) Incomplete Higher Education; (7) Complete Higher Education; #(<=85) > (86+); # (<=85) = (86+); *Yes > No; **Yes < No
Fonte: EACAC-AAVD (2021).

		Health Assessment						Kruskal-Wallis test (p)	Result	Social Activity		Mann-Whitney (p)	Result	Physical disability or impairment		Kruskal-Wallis test (p)	Result
		Excellent	Very good	Good	Regular	Bad	Terrible			Yes	No			Yes	No		
Domain 1	Mean	19.2	18.7	18.1	17.3	16	14.9	<0.001	(1) = (2) >	18.2	15.2	<0.001	*	16.5	18.5	<0.001	**
	Median	20	20	19	18	15	14.5		(3) > (4) > (5) = (6)	19	16			16	19		
	Standard Deviation	2.2	2.6	2.8	2.9	2.6	2.7			2.7	2.9			3	2.6		
	N	177	266	470	239	31	16			1152	47			212	987		
Domain 2	Mean	14.9	14.2	13.6	13.3	11.1	12.3	<0.001	(1) = (2) > (3) = (4) = (5) = (6)	13.9	11.2	<0.001	*	12.9	13.9	<0.001	**
	Median	14	14	13	13	11	12.5			13	11			12	14		
	Standard Deviation	3.1	3	3	3	1.9	1.9			3	2.2			2.9	3.1		
	N	177	266	470	239	31	16			1152	47			212	987		
Domain 3	Mean	4.8	4.6	4.5	4.2	4	3.8	<0.001	(1) = (2) = (3) > (4) = (5) = (6)	4.5	3.7	<0.001	*	4.2	4.5	0.004	**
	Median	5	5	5	4	4	3.5			5	4			4	5		
	Standard Deviation	1.4	1.5	1.4	1.4	1.3	1.5			1.4	1.3			1.4	1.4		
	N	177	266	470	239	31	16			1152	47			212	987		

Domain 4	Mean	8.4	8.1	7.9	7.7	7.5	6.7	<0.001	(1) = (2) > (3) = (4) = (5) = (6) 3 = 4 > 6	8	6.7	<0.001	*	7.4	8.1	<0.001	**
	Median	9	9	9	8	8	6			9	7			7	9		
	Standard Deviation	1.1	1.3	1.4	1.4	1.6	0.9			1.3	1.8			1.4	1.3		
	N	177	266	470	239	31	16			1152	47			212	987		
Total Score	Mean	47.2	45.7	44	42.5	38.6	37.7	<0.001	(1) = (2) > (3) > (4) > (5) = (6)	44.6	36.9	<0.001	*	41.1	45	<0.001	**
	Median	48	47	45	43	38	36			45	37			41	46		
	Standard Deviation	5.4	6.3	6.2	6.2	5.3	5.2			6.2	5.5			6.8	6		
	N	177	266	470	239	31	16			1152	47			212	987		

*Yes > No; **Yes < No

Source: SCCAS-DLAAs (2021).

Table 6: Sociodemographic Properties (Health Assessment, Social Activity, Physical Disability or Impairment) Related to the SCCAS-DLAAs

		Score
Domain 1	Correlation Coefficient	0,311
	p-value	<0,001*
	n	1199
Domain 2	Correlation Coefficient	0,154
	p-value	<0,001*
	n	1199
Domain 3	Correlation Coefficient	0,245
	p-value	<0,001*
	n	1199
Domain 4	Correlation Coefficient	0,198
	p-value	<0,001*
	n	1199
Escala total	Correlation Coefficient	0,288
	p-value	<0,001*
	n	1199

Source: SCCAS-DLAAs (2021).

Table 7: Spearman's Correlation Between the SCCAS-DLAAs and the SCCAS

As shown in Table 7, for convergent validation, Spearman's Correlation Coefficient was calculated between the SCCAS-DLAAs scale and the Self-Care Capacity Assessment Scale (SCCAS).

4. Discussion

In addition to the development of the scale, this study also aimed to analyze its psychometric properties, such as structural validity through Exploratory Factor Analysis, reliability through internal consistency or homogeneity, in addition to convergent validity, as well as discriminant validity of the SCCAS-DLAAs. The results from the present study showed acceptable or adequate psychometric properties. Therefore, it is a valid scale for its intended purpose.

Through the Exploratory Factor Analysis, the SCCAS-DLAAs scale was structured with 20 items and four domains, entitled: social activities (items: 1 to 7) concerning the environment in their social life, activities in family groups, friendships in religious and charitable organizations and also engagement in the community and political groups; leisure activities (items: 8 to 15) concerning the activities of free choice that are enjoyable and contribute to personal fulfillment due to the engagement process; intellectual activities (items: 16 and 17) that in the present study concern the daily activities that demand the use of cognition, which is the act or process of acquiring knowledge that through perception, attention, association, memory, reasoning, judgment, imagination, thought and language; and religious activities (items: 18 to 20) are understood as the extent to which an individual believes in, follows, and practices a religion. It covers the organizational, non-organizational, and intrinsic dimensions. The organizational dimension is related to the public's participation in religious services held or carried out in churches or temples. Meanwhile, the non-organizational dimension includes practices of religious activities outside the religious institution. Some examples are: reading the Bible, praying the rosary, religious meditations, and so on. The intrinsic dimension is associated with beliefs, psychological aspects of religion, knowledge and behaviors related to the religious experience which are related to the fulfillment of multiple religious activities and rites such as: praying, attending services, participating in religious groups and meetings [49].

A comparison was made with the Daily Life Advanced Activities Scale (DLAAS), which consists of 13 items, which originated from the FIBRA project and was validated by [50]. In that study, these authors found 3 domains in this scale through Exploratory Factor Analysis, namely: Leisure Activities, Social Activities, and Productive Activities. When comparing the DLAAS with the SCCAS-DLAAs, it was noted that the former was not based on the self-care activities of the SCDNT. It was also found that two domains overlapped in both scales (social activities and leisure activities).

To evaluate the measurement model the convergent and discriminant construct validity is commonly verified. In convergent validity, the indicator items of a specific construct should have a high proportion of variance in common [51]. Reported that construct validity is a judgment of the suitability of conclusions drawn on the basis of test scores for individual positions on a variable referred to as a construct. This constitutes a comprehensive validity that analyzes how test scores relate to other scores and measurements, and how test scores can be interpreted in the sphere of a theory for understanding the construct that the test is designed to measure.

In the present study, from the perspective of reliability, the internal consistency through Cronbach's Alpha showed adequate psychometric properties for the use of the SCCAS-DLAAs, since the total scale and its domains, with the exception of Domain 2 (Leisure Activities), presented scores above 0.70. [52-54]. It is worth noting that leisure activities should have their internal consistency better evaluated in future studies.

For the convergent validation of the scale under study, Spearman's correlation between the SCCAS-DLAAs and the SCCAS was used. Described that when performing an in-depth construct validity study, it is relevant to know if the instrument evaluated relates to other variables as theoretically expected and indicated emphasized that if the scores of the instrument under evaluation have a strong correlation with the zero scores of other tests as expected, it indicates convergent validity. Although Spearman's correlations are predominantly weak, the level of significance between the two scales was less than 0.001, indicating high significance [55].

Discriminant validity is the extent to which a construct differs from the others. This approach was also used in the present study to evaluate the construct validity of the SCCAS-DLAAs. Several contrasting groups were verified which presented statistically significant differences, which proves that the Daily Life Advanced Activities discriminate groups that present themselves in different states or situations. Discriminant construct validity refers to the extent to which the scores obtained from the application of an instrument differentiate individuals or populations in which a difference is expected. An example of this is: a person with pain and another without pain. This validity does not require the construct to correlate with non-similar variables.

The present study was limited to the development and evaluation of psychometric properties in elderly people from cities in southern Minas Gerais state. It is known that Brazil is diverse, having cultural, social, and leisure diversities in the various regions of the country.

5. Conclusions

The development of the SCCAS-DLAAs was found to be adequate after following the methodological steps. This scale presented adequate psychometric properties through the following stages: Exploratory Factor Analysis, internal consistency or homogeneity, and discriminant and convergent validities. Through all these processes, it was considered adequate to the Brazilian reality, focusing on the elderly. The scale will be a tool for researchers, filling knowledge gaps regarding self-care activities focusing on daily life advanced activities focusing on aging. This resource is also destined to the clinical evaluation of the elderly in the nursing care process and other interdisciplinary areas dedicated to this subject. The result stemming from this scale will be a guiding compass in the management of investigations and in the clinical sphere.

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